Social desirability and parental reporting of children's health-related behaviours.

by

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ABSTRACT

Extensive literature has documented the negative impacts of being overweight in childhood, and the difficulty in getting parents to acknowledge and act on their children's overweight status. This study aims to investigate whether social desirability could be one contributing factor to this struggle. Social desirability is a phenomenon in which individuals present themselves in the most culturally celebrated way possible, regardless of whether that is an accurate reflection of their actual self. It is argued that individuals high in social desirability may deny their children's overweight status and unhealthy behaviours due to the high social pressure for their child to be of a healthy weight. It was found that low levels of social desirability lead to reporting more congruous with the child's weight status for some health behaviours, but that it did not impact reporting of the child's weight status itself. Implications for practice are discussed.

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TABLE OF CONTENTS

ABSTRACT.....	2
ACKNOWLEDGEMENTS.....	3
TABLE OF CONTENTS.....	4
LIST OF TABLES.....	5
 INTRODUCTION	 7
Nature of childhood obesity	9
Social desirability	10
- <i>Measures of social desirability</i>	11
- <i>Social desirability and weight</i>	12
- <i>Factors that influence social desirability</i>	14
The big picture	15
MInT	16
The current research	16
Research questions	16
- <i>Question one</i>	17
- <i>Question two</i>	18
- <i>Question three</i>	18
- <i>Question four</i>	18
 METHOD	 19
Participants	19
Design	19
Materials	20
- <i>Social desirability</i>	20
- <i>Diet</i>	21
- <i>Activity</i>	22
- <i>Weight and height</i>	22
- <i>Perceived weight</i>	22
- <i>Demographic information</i>	22
- <i>Other measures</i>	22

Coding	22
Procedure	22
- <i>Recruitment</i>	23
- <i>Health check</i>	23
- <i>Follow up interview</i>	24
RESULTS	25
Characteristics of social desirability	25
Question one: Do certain factors influence levels of social desirability?	27
Question two: Do levels of social desirability predict reported levels of the five health behaviours?	27
Question three: Do participants high in social desirability under-report their child's weight?	28
Question four: Is responding more congruous with weight status in those with lower social desirability?	30
DISCUSSION	31
Question one: Do certain factors influence levels of social desirability?	31
Question two: Do levels of social desirability predict reported levels of the five health behaviours?	33
Question three: Do participants high in social desirability under-report their child's weight?	36
Question four: Is responding more congruous with weight status in those with lower social desirability?	38
Limitations	
Conclusions	
REFERENCES	
Appendix A: Social desirability questionnaire	
Appendix B: Dietary questionnaire	
Appendix C: Exercise questionnaire	
Appendix D: Perceived weight and concern questionnaire	
Appendix E: Demographic information questionnaire	

LIST OF TABLES

Table 1: Demographic information of participants and their parents

Table 2: Social desirability levels of parents with children in each of the three weight categories.

Table 3: Number and proportion of true/false responses for each item in the social desirability scale.

Table 4. Frequencies and mean social desirability scores for perceived weight category.

Table 5. Frequencies and mean social desirability scores for actual weight category.

Table 6. Frequencies and mean social desirability scores for four-point weight status differences.

Social desirability and parental reporting of children's health-related behaviours.

In a report released in 2008, New Zealand's Ministry of Health revealed a sobering statistic: more than one in five New Zealand children between the ages of 2 and 14 were classified as overweight, and a further one in twelve were classified as obese (Ministry of Health, 2008). Perhaps even more concerning was the fact that these prevalence rates did not differ significantly from the report released in 2002, indicating that no effective intervention had been put in place over the previous six years to bring this staggering number down.

These weight issues are not isolated to one period of childhood, but remain stable across a child's life span. The report stated that there was no significant difference in obesity rates between children aged 2-4 (7.6-9.1%), 5-9 (8-8.4%) or 10-14 years (7.7-9.2%), indicating that obesity is an issue persisting through all stages of childhood (Ministry of Health, 2008). From adolescence, rates of obesity grew steadily, peaking at 35.9% – over a third of the sample – in those aged between 55 and 64. Despite the misconception in popular culture that early weight or “puppy fat” is self-correcting or outgrown with time, these figures suggest that early obesity may in reality be an enduring condition which has significant implications for health in adulthood. As such, it is important to reduce these high base rates in childhood before the upwards curve in adulthood.

According to The World Health Organisation (2000), obesity puts individuals at an increased risk of developing a huge range of health problems. Aside from being classified as a disease within itself, obesity puts adults at an increased risk for a number of other chronic diseases, such as adult-onset (Type II) diabetes, coronary heart disease, and certain forms of cancer. Even when other factors such as smoking were removed, being severely obese was related to a twelve-fold increase in mortality for those aged between 25 and 35. The report states that while the most salient risk for obese children is the continuation of their obesity into adulthood - thus placing themselves at risk all of these associated diseases - there are also multiple health problems associated with obesity in childhood, such as dyslipidemia, hypertension, insulin resistance and orthopaedic issues. This means that in New Zealand, one in five children are at greater risk of developing these weight-related health complications during their childhood, and one in twelve are at significantly greater risk.

Above and beyond these direct physical implications, being obese in childhood and adolescence has been found to have a psychological impact (World Health Organisation,

2000). Preadolescent children associate being overweight with impaired social and academic abilities, lower levels of fitness and general health, and even defects in the individual's character (Hill & Silver, 1995; Lerner & Gellert, 1969; Staffieri, 1972). In adolescence, body mass index (BMI) has been found to be negatively associated with both body image and overall self-image, possibly because of heightened self-awareness of body shape paired with the negative associations formed in childhood (Strauss, 2000). Furthermore, women who were overweight in adolescence were less likely to marry, and more likely to live in poverty than women who had other chronic physical conditions during the same period (Gortmaker, Must, Perrin, Sobol, & Dietz, 1993). This indicates that obesity throughout childhood is taking not only a physical toll on children, but also a psychological one with potentially long-lasting implications.

The World Health Organisation also identifies that there are significant financial costs associated with this increased risk: up to 7% of total healthcare costs in developed nations is spent on health complications due to obesity. This means that not only is it impacting the lives of sufferers and their families, it is having a direct impact on the national economy, and thus, all citizens of that community (World Health Organisation, 2000).

When considered, both the short and long term risks of obesity and being overweight in childhood, together with the economic implications of ill health associated with the condition, would make it seem logical that changing the weight status of overweight New Zealand children would be a high priority. This has been attempted via increased public awareness of these dangers through nationwide campaigns (Ministry of Health, 2009b); however, it appears that something is getting in the way of what seems like a natural move towards improving the health of New Zealand's children.

One reason for the apparent lack of change is that uptake into interventions is notoriously poor. National media campaigns regarding diet (5+ A Day, 2011a) and exercise (Sport and Recreation New Zealand, 2011) offer no decrease in the levels of obesity and further research has found that when parents are directly offered interventions to deal with their children's weight, they often decline to participate (Chamberlin, Sherman, Jain, Powers, & Whitaker, 2002). There are a number of factors that have been identified as potentially contributing to this limited engagement in attempted obesity interventions, including poor parental recognition of their children's weight status (Baughcum, Chamberlin, Deeks, Powers, & Whitaker, 2000); shifting perspectives about what constitutes being overweight (Maximova et al., 2008); and the struggle that medical professionals face in feeding information about weight back to parents (Walker, Strong, Atchinson, Saunders, & Abbott,

2007). Of these potentially limiting factors, the issue that has received the most empirical attention is the low levels of parental acknowledgement of their child's problematic weight status (Baughcum, et al., 2000; Carnell, Edwards, Croker, Boniface, & Wardle, 2005; McLean, Wake, & McCallum, 2007). For example, in a large-scale study by Baughcum et al. (2000), it was found that only 21% of mothers accurately reported their child's overweight status, while 79% under-estimated their overweight child's weight status as 'healthy'. The authors concluded that this result was a reflection on parents' inability to correctly evaluate their child's weight. Other such studies have reported similar findings: in a sample of pre-school children and their parents, it was found that less than two percent of parents whose children were overweight and 17.1% of parents whose children were obese identified that their children were overweight, and none reported that their child was very overweight (Carnell, et al., 2005). However, in this study over half of these parents did express concern that their child may become overweight in the future. This may reflect both an inability to correctly estimate children's weight status, as well as shifting perspectives about what constitutes a normal weight and a lack of education about the pervasiveness of childhood weight issues. It may also indicate that while parents appear to be aware of the ongoing health risks associated with being overweight in later life, they are not aware of the more immediate risks to their children's health and wellbeing as a result of being overweight at a young age.

Both of these ideas are supported by research suggesting that parents are able to recognise weight issues in their children when they begin to cause observable problems (Jain et al., 2001). In a sample of low-income mothers, it was found that ratings of obesity was not based upon traditional medical methods of height and weight, but by the extent to which the child's weight was seen to be a negative influence on the child's life. For example, the mothers of children that were the victims of higher levels of teasing, or whose weight restricted their capacity for physical activity, were more likely to rate their child as overweight than mothers of children the same weight but less victimised or incapacitated. Regardless of the child's weight, the mothers did not rate them as overweight if they ate well and were regularly active. This indicates that mothers are aware of the factors that contribute to a healthy weight, and may genuinely believe that their children meet these criteria.

The idea that there has been a shift in perspectives about what constitutes a 'normal' weight was supported by a study by Maximova et al. (2008) which found that overweight and obese children were more likely to misperceive their own weight if parents and

classmates had similarly high BMIs. Overweight children who were constantly exposed to environments where being overweight or obese was more prevalent, or even normative, were less able to recognize that they fell towards the overweight end of the spectrum. This issue was particularly apparent in the younger participants, which the authors attribute to the relative lack of media influence, where being a healthy weight or even underweight is normative.

Other research has found that children are actually more objective at estimating their own weight than their parents (Blaženčić-Mladenović et al., 2006). While over 70% of the overweight/obese girls in this study classified their weight status accurately, only 41% of their parents were able to do so. As the authors point out, this is concerning as many of the children expressed the desire to change their bodies, but may lack the parental support to do so in a healthy or maintainable way. This evidence supports the need for further parental education around weight issues, and for the barriers preventing parents from accurate recognition to be identified, in order to be overcome.

While the above studies provide important information about parental difficulty in accurately recognising or reporting their child's weight status, the mechanisms underlying these difficulties were not explored. Subsequent studies have looked at this issue in depth, and had a variety of results. Huang et al. (2007) found that parental ability to correctly assess their child's weight was significantly correlated with the child's age and weight status. Parents were significantly better at correctly estimating their own child's weight status when the child was older, and classified as normal or underweight. When the child was below school age or overweight, accuracy decreased significantly. Perhaps even more interestingly, parental ability to accurately identify the weight status of their own children was not related to their ability to identify the weight status of unrelated children, or their rating of ideal body shapes in unrelated children. This finding may indicate either that parents hold different standards when judging the weight of their own children, or that parents are in denial or refuse to admit to their child's overweight status, especially when the child is young.

An Australian longitudinal study following a birth cohort has revealed a number of further factors that may influence parental misclassifications of their children's weight status, including gender, levels of child dissatisfaction with their weight and body shape, and maternal weight (Mamun, McDermott, O'Callaghan, Najman, & Williams, 2007). In the sample of 2650 children and their mothers, 37% of mothers with overweight children classified their children as being of a healthy weight, and were more likely to incorrectly

classify their healthy-weight children as underweight rather than overweight. There were a number of variables found to be associated with the mothers' ability to correctly identify their children's weight. Mothers were more accurate at classifying weight in female children than in male children, regardless of which weight category they fell into. If the child was dissatisfied with their own weight, the mothers were more likely to correctly estimate, or even over estimate, their weight category. Maternal BMI was also found to be a factor: mothers who were obese or overweight were less likely to classify their children as such. Additionally, mothers who placed great importance on unified family meals were more likely to under-estimate their child's weight status. The authors acknowledge a number of potential causes for these high levels of mis-estimation, including those issues already discussed.

Finally, the struggles faced by medical professionals in dealing with conveying weight information to parents may also contribute to the lack of adequate intervention in childhood (Klein et al., 2010; Walker, et al., 2007). While doctors admit that raising the issue of children's weight with parents falls within their scope of responsibility, many believe that obesity in itself is a societal issue for families to deal with. They also feel ill-prepared and ill-equipped to deal with such conversations, especially given the time restraints of GP appointments. Furthermore, doctors struggle with the idea that discussing such a sensitive issue may cause problems in the doctor-client relationship, especially given that the advice they are attempting to dispense is usually contradicted by advice the parent has received from friends or family (Chamberlin, et al., 2002). A combination of this resistance from GPs to discuss weight issues with parents and parents' under-estimation of weight issues in their children is almost undoubtedly contributing to the low levels of parent engagement in weight-loss interventions for their children.

Nature of childhood obesity

As well as research looking at rates of obesity and uptake into intervention, there is an ever-growing wealth of literature looking at factors that contribute to the development and maintenance of obesity in children. Intake of fruits and vegetables has received much literary and media attention (5+ A Day, 2011a), and it is now well established that adequate consumption of these has many health benefits, including maintaining a healthy weight. The '5-Plus A Day' campaign is now in its 17th year (5+ A Day, 2011b), and thus has been present for the entire life span of any youth sample. However, over the past decade, a number of additional health behaviours have also been identified in contributing to levels of obesity in children. Sleep duration has often been implicated in weight gain for both

children and adults, with those who sleep less consistently displaying higher BMIs (Cappuccio et al., 2008). Sweet drink consumption, sedentary minutes and exercise minutes were all recently reviewed by fifteen expert representatives from professional organisations (Barlow & Committee, 2007). Each were found to uniquely contribute to obesity in children, and guidelines for healthiest behaviours were produced for each. It was recommended that sweet drink consumption should be eliminated or at least minimised, that screen time (sedentary minutes) should be restricted to no more than two hours per day, and that children should be engaging in at least sixty minutes of physical activity per day. Of these behaviours, only one has been the subject of an obesity-related public health campaign: physical activity has received wide-spread media attention due to the extensive 'Push Play' campaign (Sport and Recreation New Zealand, 2011). While this campaign is specifically aimed at adults, it has brought awareness of the importance of exercise as part of a healthy lifestyle into New Zealand families.

Social Desirability

The most commonly drawn conclusion thus far in the literature on parental ratings of children's weight status in overweight children is that parents are unable to accurately identify their child's weight status, particularly when they are overweight. It is possible, however, that parents are not simply unaware of their child's weight: parents may be reporting an overly positive picture of their child's health due to concerns about how their child's weight reflects upon their efficacy as parents (Coleman & Karraker, 1998). Social desirability refers to people's underlying need to be perceived in a favourable light (Crowne & Marlowe, 1960). It is based around the idea that individuals are aware of what is culturally acceptable, appropriate and celebrated, and that they respond to questions or individuals in a way that reflects these values, even if they are not necessarily true of the person in question (Crowne & Marlowe, 1960; Paulhus, 1989). Social desirability does not alter responding in any one simple, definable way, as it depends on the person's perception of what is socially desirable given the particular setting or focus of the questionnaire. Basically put, high social desirability increases the chance that participants will misrepresent themselves if they perceive the correct or honest answer to be socially undesirable, and can see or think of a more desirable or acceptable option.

It has been argued that there are two key dimensions in biased responding: self deception and impression management (Paulhus, 1989). Self deception refers to the tendency of individuals to present themselves in a way that they perceive to be honest, but which in fact

is enhanced. Impression management refers to the explicit manipulation of information in order to present oneself as one perceives to be ideal, even if one knows it to be inaccurate. The present study focuses on the latter, and therefore utilises the Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960), which measures impression management: the intentionally biased responding stemming from the need to be seen in a positive light (Holden & Fekken, 1989; Paulhus, 1989). Thus, when ‘social desirability’ is referred to from here on, it will be in regards to this form of biased responding, not self deception.

Measures of social desirability

Social desirability is most commonly measured using the MCSDS. This scale consists of 33 items and was designed in response to criticism of the then commonly-used Edwards Social Desirability scale (Edwards, 1957). This criticism came from the Edward Social Desirability scale having items derived from the Minnesota Multiphasic Personality Inventory (MMPI) Lie Scale, and therefore being more of a measure of psychopathology than of social desirability reflective of the general population (Paulhus, 1989). Thus, Crowne and Marlowe (1960) redeveloped the scale using more culturally approved everyday behaviours that had a low rate of occurrence, rather than the more pathological items taken from the MMPI scale. This quickly overtook Edwards’ scale in popularity and by 1982 was the most widely used social desirability measure (Reynolds, 1982), and had been cited in over 3,600 articles by 2007 (Twenge & Im, 2007).

The impact that social desirability has on self-report responses in psychological studies has been extensively investigated (Holden & Fekken, 1989; Holtgraves, 2004; Nederhof, 1985; Paulhus, 1989; Twenge & Im, 2007). While no one pattern of socially desirable responding has been identified, as this varies depending on what response is perceived to be socially desirable by the individual at the time, some trends in socially desirable responding have emerged. For example, lower social desirability scores are obtained – that is, people admitted to more undesirable behaviours – when participants are anonymous, rather than when they provide an identifier that can be linked to them (Joinson, 1999). Scores are even lower when the measure is administered using the internet, rather than the traditional pen-and-paper method. The author attributes this to the disinhibition afforded to us by the internet, especially when one is able to remain anonymous. However, in the context of healthcare delivery, anonymity is impossible as the respondent’s answers must be linked to them in order to correctly identify problems and the appropriate response to managing them.

Another characteristic that has been identified in socially desirable responding is response time. Holtgraves (2004) had participants respond to questionnaires in situations that either increased (non-anonymous; participants were told that the questionnaire would be used to create a profile that would be associated with them) or decreased (completely anonymous) social desirability demands. It was found that participants responded significantly faster in the decreased social desirability condition than in the increased social desirability condition. The author argues that this delay in responding in the social desirability condition points to an active response editing mechanism that occurs during the evaluation phase of selecting a response, indicating that individuals complete the entire retrieval process and then evaluate the most desirable option out of an entire set, rather than terminating their retrieval search as soon as an acceptable response is found.

Given these patterns, social desirability measures themselves (such as the MCSDS) are most often used to ensure that another measure of interest is not inadvertently measuring the same thing (Paulhus, 1989). If the correlation between the social desirability measure and the target measure is too high, it may be concluded that the target measure is too susceptible to social desirability to be of any use. This is most commonly an issue in measures looking at beliefs, attitudes, personal qualities or self-reported behaviours (Paulhus, 1989). However, it can also be used to learn about social desirability itself, for example what settings and modes of replying it is most sensitive to, or even to exclude participants with particularly high social desirability scores as a preventative measure (Holtgraves, 2004; Paulhus, 1989).

Social desirability and weight

While no research has directly investigated parental reporting of children's weight; social desirability has been shown to affect individuals' reporting of their own weight, exercise and eating behaviours (Adams et al., 2005; Hebert, Clemow, Pbert, Ockene, & Ockene, 1995). For example, Herbert et al. (1997) found that for every increasing MCSDS point, under-reporting of energy intake increased by 19.2 kcal/day and fat intake by 0.8 g/day. Similarly, Adams et al. (2005) found that social desirability was associated with over-reporting of physical activity, resulting in both an overestimation of both physical exertion and an overestimation of activity durations. Social desirability has also been found to influence people into reporting higher levels of activity on self-report measures (Motl, McAuley, & DiStefano, 2005). These findings indicate that not only is social desirability associated with reporting of attitudes and beliefs as found in previous literature, it also directly relates to the reporting of measurable behaviours, such as length and effectiveness of physical activity, and number of calories consumed per day.

Social desirability has also been linked to mistaken attribution of weight-loss effectiveness (Carels, Cacciapaglia, Rydin, Douglass, & Harper, 2006). As in previous studies, Carels et al. found that those ranked higher in social desirability reported lower calorie intake, but they also found that these individuals reported greater perceived weight loss competence, higher weight loss self-efficacy, and fewer reported lapses in terms of dietary restrictions. Furthermore, individuals with high social desirability scores had lost significantly less weight at the end of a six-month period.

But why is it that we should expect, and find, such a high impact of social desirability on weight and health behaviour reporting? Woodman and Hemmings (2008) identified that for many individuals, the body is an essential domain of one's self. Individuals are increasingly reporting body-related facts as relevant to themselves (i.e. naming 'in good shape' as a key self fact), and the difference between perceived body shape and ideal body shape has been found to correspond with greater negative affect. Somewhat related to this, a recent review article stressed the importance of social comparison and social identity as two key factors in determining one's body image (Grogan, 2010). Both one's level of investment in social norms, and one's tendencies to use external sources/standards against which to judge oneself predict one's level of satisfaction with one's own body image. Given that social desirability seems to rely on both of these mechanisms – that one is aware of social standards and judges oneself accordingly – this would seem to provide one explanation as to the link between social desirability and weight: individuals high in social desirability would report their health behaviours to be better than they are, because this is what they view as being valued in society. This is further supported by emerging research indicating that social cynicism, defined in the literature as the cynical beliefs an individual holds about the world, is positively related to appearance and weight satisfaction (Lam, Mak, & Walker, 2010). Individuals high in social cynicism were found to be less likely to take on societal expectations and norms in regard to body image, and therefore any weight dissatisfaction was less likely to impact their general sense of self. Given that social cynicism seems to represent the directly opposite mechanism to social desirability, it could be argued that this provides a rationale for the high levels of social desirability found in weight research.

In addition to these internal processes within individuals, the external world may also contribute to this high correlation between social desirability and weight. Twenge and Im (2007) identified that social desirability levels fluctuate depending on the social demands of the time. Furthermore, as previously mentioned, the risks of being overweight are becoming ever more apparent, with attempts to educate the public of the dangers increasing (Ministry

of Health, 2008, 2009b). This combination of factors would lead us to expect high levels of social desirability around weight issues, especially in light of a recent study by Puhl, Andreyeva and Brownell (2008) which found that weight discrimination was almost as prevalent as race discrimination in the United States. In their sample of 2,290 Americans, ten percent of all women, and 45 percent of women with a BMI of above 35, reported daily or lifetime discrimination based upon their weight. Rates were significantly lower for males (five percent of all males, and 25 percent of those with a BMI above 35). In women, this level of discrimination was higher than that due to race, although lower than that due to age or gender. In the overall sample, it rated below age, gender and race due to the lower rates of weight discrimination experienced by men. These high levels of discrimination, while shocking, are congruent with the ever-increasing awareness of the stress obese individuals place on the healthcare system, as well as the direct interpersonal effects being obese may have on others: for example, being seated next to an obese individual on a long-haul flight. This highlights the pressure that individuals are under to conform to weight norms, potentially signalling a link between social desirability and weight reporting. Therefore, it could be reasonably hypothesised that social desirability may be one factor contributing to low levels of overweight reporting.

Factors that influence social desirability

Patterns of social desirability have changed across time (Twenge & Im, 2007). The need for social approval as reflected by social desirability scores declined during 60s and 70s and levelled off after 80s. The authors attribute this to the changing state of society: given that social desirability demands that one conforms, as the rules of society become more lax one can expect rates of social desirability to decrease. This hypothesis is supported by the fact that patterns in levels of social desirability were negatively correlated with phenomena such as divorce rate, crime rate, and the youth suicide rate – things that had been highly unacceptable and certainly undesirable earlier in the century.

Beyond these patterns of how socially desirable responding is manifested, one area in particular has been identified as pertaining to levels of social desirability between individuals: levels of educational attainment (Hebert et al., 2001; Heerwig & McCabe, 2009). Levels of education have persistently indicated different levels of socially desirable responding. Most studies have concluded that higher levels of social desirability are found in those with lower levels of education (Heerwig & McCabe, 2009; Ones, Reiss, & Viswesvaran, 1996). However, this finding does not hold true when it comes to issues around weight. When asked about macronutrient intake, Hebert (2001) found more socially

desirable responses in participants with higher levels of education than those with lower levels of education. They hypothesise that this could be due to the fact that higher education is often reflective of higher socio-economic status, and that higher socio-economic environments often have more readily available and emphasized health information. This finding does not hold true for all studies of health behaviours, though, with some studies finding no difference in social desirability levels across education levels (Carels, et al., 2006). Factors such as age, BMI, and income levels have also been investigated as potentially having an impact on social desirability levels, although studies have found no effects of any of these factors on socially desirable responding (Carels, et al., 2006).

The big picture

Obesity rates in children are not declining, with levels now being no different to those in 2002 (Ministry of Health, 2008). This is happening in spite of increased literature about both the potential health implications of being overweight in childhood (World Health Organisation, 2000), and the factors that are contributing to weight problems (Barlow & Committee, 2007). A number of potential reasons for this lack of change have been identified, most centring about a genuine lack of awareness about weight issues on behalf of parents (Baughcum, et al., 2000).

It is possible, however, that it is not entirely a genuine lack of awareness that is being seen, but a reluctance to admit to, or accept, what parents know to be the problematic weight status of the child. This could be because of the reflection it has on them as a parent: being a capable parent has been found to be a large component of one's sense of self-efficacy and self worth (Coleman & Karraker, 1998; Salonen et al., 2009). The increasing pressure to be the 'perfect parent' can be seen simply by looking at the exponentially-growing number of parenting books available. At the same time, public pressure to live a so-called 'healthy lifestyle' is growing, both through national media campaigns and through growing social prejudices against obese individuals (5+ A Day, 2011a; Puhl, et al., 2008; Sport and Recreation New Zealand, 2011). What appears to be a genuine lack of awareness, then, may actually reflect an attempt on the behalf of parents to preserve their self-esteem in terms of their value and ability as a parent.

Social desirability refers to an individual's need to be seen in a positive light, and has been found to respond to environmental changes that dictate the most desirable behaviours at any given time (Paulhus, 1989; Twenge & Im, 2007). While social desirability has never been looked at in terms of the reporting of one's behaviours as a parent, or reporting

behaviours on behalf of one's child, the intricate link between parenting and sense of self points towards its potential implication. Furthermore, the increasing salience of positive health messages may increase the likelihood that this parental social desirability would come into play in a weight-based health context. The current study aims to untangle the relationship between social desirability and parental reporting of children's weight status.

MInT

The Motivational Interviewing in Treatment (MInT) study is a project being conducted at the University of Otago, looking at how New Zealand children are growing, and how they can best be helped to lead a healthy lifestyle. This involves collecting information from children and families enrolled in multiple Dunedin medical practices – including the child's height and weight, but also a large number of variables to do with family functioning, eating, and exercise behaviours. Participants are randomised to receive the feedback about their weight in one of two ways: usual care, or using Motivational Interviewing. During the feedback process, the recommended levels of five behaviours identified in previous literature to contribute to childhood obesity are given to parents to assist them in creating healthy lifestyles for their children. Following this, children who are eligible (a BMI above the 85th percentile) are randomised into one of two intervention groups: usual care, or a more intensive, tailored, family-focussed intervention. The MInT study has two main points of interest: trialling ways of feeding back weight information to families, and trialling ways of intervening with families with overweight or obese children. A complete outline of the aims and procedures can be found in Taylor et al. (2010).

The current research

Given the low rates of parental recognition of children's overweight status, combined with the similar findings in social desirability research, it is important to consider social desirability as one possibility as to why parental reporting of a child's overweight status is so low. As mentioned previously, social desirability has been found to change depending on what society currently dictates as desirable (Twenge & Im, 2007). Therefore, the current push for healthier lifestyles (e.g. Ministry of Health, 2009b) may actually lead to an increase of the impact of social desirability when it comes to weight, especially in the context of parenting. However, there is currently no literature on how social desirability impacts parental reporting of weight and/or health related factors relating not to themselves, but to their children. Thus, the current research aims to explore the incidence of social desirability

in parents of children in New Zealand, particularly those at risk of weight-related health problems, and then how these contribute to reporting of health behaviours.

Research questions

Question one

The first research question involves exploring how social desirability manifests in New Zealand parents, and assessing factors that may contribute to this. Due to the lack of literature in this area, particularly for New Zealand participants and participants completing the questionnaire in the context of their child's health and lifestyle, this is will be largely exploratory. However, some predictions were deduced from patterns found in previous research. While not all findings have been consistent, the majority of studies looking at health behaviours have found that higher levels of education reflect higher levels of social desirability (Hebert, et al., 2001). Therefore, it is hypothesised that maternal education levels will have an impact on social desirability levels. As research suggests that greater available disposable income results in more exposure to health messages through health care and engagement with the media (Adler, Boyce, Chesney, Folkman, & Syme, 1993; Wangberg et al., 2008), perceived financial strain is hypothesised to have a negative relationship with social desirability. For similar reasons, it is hypothesised that there will be a positive relationship between maternal age and social desirability.

Previous literature has found markedly lower levels of concern about children's weight in parents of younger children than older, potentially due to the 'puppy fat' myth in popular circulation (Huang, et al., 2007). This indicates that parents see being overweight at a younger age as being more acceptable than at an older age, and therefore it is hypothesised that the age of the child will have a positive relationship with social desirability levels.

Finally, both the child's and the parent's BMI are expected to have a positive relationship with social desirability scores. Being in a health setting for a weight-based assessment is likely to activate one's social desirability beliefs around weight, and this is expected to be more salient for those who are carrying greater than average body mass.

Question two

The second research question involves looking at whether social desirability influences reporting of five health behaviours identified by previous literature on having a bearing on weight status in children: fruit and vegetable intake, screen time, exercise, sleep duration and sweet drink consumption. Based on the literature both on social desirability and children's weight status, it is hypothesised that parents with high social desirability will be

more likely to answer ‘desirably’ – that is, report higher fruit and vegetable intake, lower screen time, higher levels of exercise, longer sleep duration and lower sweet drink consumption – than their low social desirability peers.

However, given the dependence of social desirability upon socially dictated standards, it is also hypothesised that these effects will be greater for behaviours that have well-established recommended levels that have been frequently reported in the media, than those who have received limited non-scientific attention. The ‘5-Plus A Day’ and ‘Push Play’ campaigns have been ubiquitous in New Zealand media for a number of years, educating New Zealanders about recommended levels of fruit and vegetable intake and exercise duration (5+ A Day, 2011a; Sport and Recreation New Zealand, 2011). Thus, it is hypothesised that social desirability will have the strongest impact on reporting of these two behaviours. For the other three behaviours, for which the recommended levels have not received widespread media attention or had campaigns, it is hypothesised that social desirability will have less of an effect as parents will not have a target figure to aim for.

Question three

The third research question involves looking at parental estimations of children’s weight status, and whether these are congruous with their actual status. Based upon the literature on social desirability and around weight, particularly the high levels of discrimination, it is hypothesised that parents high on social desirability will report that their children have lower weight statuses, and will show the greatest difference between reported child weight status and the child’s actual weight status.

Question four

The fourth and final research question looks at whether social desirability and the child’s weight status interact to predict the five reported health behaviours – that is, whether social desirability causes parents to report significantly different levels of these behaviours if their children fall into particular weight category. It is hypothesised that reports will be more accurate in the low social desirability group – that is, reported behaviours will be more congruous with actual weight status than they will be in the medium or high social desirability groups. For example, in the low social desirability groups it is hypothesised that those in the obese category will report the least recommended levels of a behaviour, and that those in the healthy range category will report the most recommended levels. This effect is expected to lessen as social desirability increases and parents move away from honest to more desirable responding.

Again, the salience of health messages regarding recommended levels of the target behaviour is predicted to influence the impact of social desirability. Due to the reasons discussed previously, parental reports for the behaviours, fruit and vegetable intake and exercise are hypothesised to predict highest discrepancies - whereas, due to less media attention - reports regarding screen time, sweet drink intake and sleep duration may not produce as marked differences.

Method

Participants

This study included 601 children between the ages of 4 and 9.3 years (mean age 6.4 years, standard deviation 1.5 years) (see Table 1 for overview of demographic information). Participants were recruited from a number of primary health care and secondary health care medical centres in Dunedin. All children within the selected age range enrolled at each of these practices were invited to participate in the study in order to gather a participant pool reflective of the region's economic, geographic and ethnic diversity.

Table 1: Demographic information of participants and their parents

Age		
	Mean	SD
Maternal	37.29	5.586
Paternal	47.37	20.85
Ethnicity		
	N	
NZ European	524	
Maori	83	
Pacific Island	29	
Chinese	7	
Indian	2	
Other	43	

Note: the ethnicity values add up to greater than the number of participants due to some parents selecting more than one ethnicity.

Design

This study used a combination of between- and within-subjects tests to investigate the relationship between social desirability and the other variables of interest. Given the lack of previous literature in this area, many of the tests will be explorative to establish what, if any, relationships exist between social desirability and parental reporting of their children's health-related behaviours.

The independent variable for the majority of analyses will be social desirability, either by categorising participants into low (scores between 0 and 7), medium (scores between 8 and 10), and high (scores between 11 and 13) groups, or by correlating the 13-point social desirability scores with a number of other variables. Social desirability will be contrasted with several dependent variables: perceived weight status of child, actual weight status of child, fruit and vegetable intake, sleep duration, exercise duration, sedentary time, and sweet drink consumption.

Other analyses will use the child's weight status (healthy range, overweight and obese) as the independent variable. The child's weight status will be contrasted with five dependent variables: fruit and vegetable intake, sleep duration, exercise duration, sedentary time, and sweet drink consumption. One further analysis will measure the impact of six independent variables (maternal age, the age of the child, maternal BMI, the BMI of the child, maternal education levels, perceived financial strain) on one dependent variable (social desirability).

Materials

All measures outlined below are included in Appendices A-E.

Social desirability. Given the size of the other measures, in order to reduce participant burden it was decided to opt for the shortest social desirability measure that displayed adequate reliability and validity. Following this criteria, the 13-item short form of the Marlowe-Crowne Social Desirability scale (MCSDS) outlined by Reynolds (1982) was selected (Appendix A). This 13-item short form, referred to as 'Form C', has a Kuder-Richardson formula 20 reliability of .76, and a correlation of .93 ($p < .001$) with the original Marlowe-Crowne scale, making it the shortest form of the MCSDS with acceptable reliability and validity. In the current sample, the measure had a Cronbach's alpha of .64, with individual items ranging between .64 and .61. The MCSDS Form C includes thirteen statements, including 'No matter who I'm talking to, I'm always a good listener' and 'I am sometimes irritated by people who ask favours of me.' Participants are asked to identify whether each statement is 'true' or 'false' as it relates to them personally.

Diet. The measure relating to diet is a simple measure of the number of servings of fruit, vegetables, and sweetened drinks that the child consumes on a daily basis (Appendix B). For fruit and vegetables, this is measured on a seven-point scale from ‘My child doesn’t eat fruit’, ascending in half-serve increments to ‘3 or more serves’. The sweet drink intake is rated on a six-point scale from ‘none or less than ½ drink’ to ‘4 or more drinks’.

Activity. Levels of physical activity were obtained by asking parents to rate how many hours each week and weekend day their child spends doing activity intense enough to make them puff or sweat, and in turn, how many hours they spend watching TV or playing computer/video games, which are identified as forced sedentary hours (Appendix C). Parents were also asked to rate how active their child is compared to other children on a five-point scale from ‘much less active’ to ‘much more active’.

Weight and height. Height was measured to the nearest millimeter using a portable stadiometer. Weight was measured to the nearest 0.1 kg by Tanita electronic scales, and waist circumference (at the umbilicus) was measured to the nearest 0.5 cm using a non-elastic measuring tape.

Perceived weight. Parents were asked to rate what they believed their child’s current weight status to be on a five-point scale from ‘very underweight’ to ‘very overweight’, and how concerned they were about their perceived weight on a five-point scale from ‘very concerned’ to ‘not at all concerned’ (Appendix D).

Demographic information. Information pertaining to current levels of financial strain, maternal education levels, ethnicity, ancestry, and parental height and weight was collected (Appendix E).

Other measures. The materials here are not an exhaustive list of the measures given to parents in the MInT study, but of those used in this particular research project. For a review of all measures used, refer to Taylor et al. (2010).

Coding

Body mass index was broken into five traffic light inspired categories based upon percentiles. Children in the third percentile or lower were placed in the ‘below green’ group, those between the third and 85th percentiles were placed in the ‘green’ group, those between the 85th and 95th percentiles were placed in the ‘orange’ group, those between the 95th and 97th percentiles were placed in the ‘red’ group, and those in the 97th percentile and above were placed in the ‘above red’ group. For the purposes of some analyses, the two green

groups and two red groups were collapsed together to create three groups, labelled ‘healthy range’, ‘overweight’ and ‘obese’.

Fourteen social desirability questionnaires were excluded from the sample. Two had indecipherable participant codes, and the remaining twelve had either missing or multiple responses. For some analyses, the participant responses were divided into three groups: low (scores between 0 and 7), medium (scores between 8 and 10), and high (scores between 11 and 13). In these analyses, the five-point actual weight status scale was also split into three groups: healthy range (below average and average), overweight (overweight), and obese (obese and very obese).

Because the way that maternal education was scored was non-linear, it was re-coded into ‘no educational qualifications’, ‘completed high school qualification’, and ‘completed tertiary qualification’ in order to be comparable to previous literature (e.g. Baughcum, et al., 2000; Carnell, et al., 2005).

Procedure

Recruitment. Letters of invitation and information brochures were sent to parents of all children within the identified age range at the participating health practices. Families were then contacted by phone approximately a week after receiving this information in order to ascertain their interest in taking part in the study, to confirm their eligibility to participate, to place the participant in a randomised condition, and to book an appointment for the family to come in to participate in the first health check.

Health Check. At the health check, participants were informed about what they would be doing during the session, and given a brief overview of the study. Participants had a consent form presented and explained to them, which was completed and signed before any testing took place. Upon completion of this, the child was taken with one researcher to have their measurements taken. At the same time, parents completed a number of self-report measures on the computer, while the second researcher remained available to assist them if required. The MCSDS Form C was not included in this computer battery, but was completed directly afterwards with pen and paper and left for the researcher to collect at the end of the session. The second researcher also measured the parents’ height and weight, or assisted them with this if they felt uncomfortable having the researcher do it.

When the child’s measurements had been taken and the parents had finished the questionnaires, the child was taken to a separate room with activities to keep them entertained while the child’s BMI, waist-height ratio and blood pressure, as well as parental

responses and the recommended levels of five behavioural characteristics: fruit and vegetable intake, exercise, screen time, sweet drink intake and sleep were fed back to parents. Depending on which condition the child was placed in, this information was delivered either in standard usual care, or by using Motivational Interviewing. This session was videoed for later coding and supervision.

Follow up interview. If the child had a BMI that placed them at elevated risk of weight-related health problems in the future (i.e. fell in the orange, red or above red zone), a further appointment was booked for the parents to come back in, discuss how they found the health check session, decide if they'd like to take part in intervention, and, if so, be allocated to an intervention condition. The follow up interview was generally two weeks after the health check session, and parents completed a shortened version of the questionnaires they completed at the health check (minus the MCSDS) to assess whether any change had occurred in the meantime. From there, families were randomised to one of two intervention conditions, but the present research does not extend beyond the feedback session.

Results

The characteristics of social desirability within the present sample are presented. Each of the hypotheses are then examined, using a combination of regression and univariate analyses as follows: Regression analysis was used to address the question of whether certain factors predict an increase or decrease in social desirability levels, and then whether social desirability levels predict an increase or decrease in the reporting of five key health behaviours. Univariate analysis was used to address whether there are differences in social desirability levels in those who accurately and inaccurately perceive their child's weight status, and finally, whether there was an interaction between social desirability and weight status in reporting of children's health behaviours.

Characteristics of social desirability

Mean levels of social desirability were calculated for the entire participant pool, as well as for each of the weight categories (see Table 2). There was no significant difference in social desirability levels between any of the groups ($F(2,597) = .018, p > .05$).

Table 2: Social desirability levels of parents with children in each of the three weight categories.

<i>N</i>	Mean	<i>SD</i>	Range
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Total sample	601	8.59	2.517	0-13
Healthy range	462	8.58	2.549	0-13
Overweight	89	8.64	2.288	4-13
Obese	50	8.56	2.659	1-13

The proportion of participants who responded desirably for each of the social desirability items can be seen in Table 3.

Table 3: Number and proportion of true/false responses for each item in the social desirability scale.

Statement		True: N(%)	False: N(%)
1	It is sometimes hard for me to get on with my work, if I am not encouraged.	168 (28)	433 (72)
2	I sometimes feel resentful when I don't get my own way.	271 (45.1)	330 (54.9)
3	No matter who I'm talking to, I'm always a good listener.	505 (84)	96 (16)
4	There have been occasions when I took advantage of someone.	142 (23.7)	458 (76.3)
5	I'm always willing to admit when I make a mistake.	492 (82)	108 (18)
6	I sometimes try and get even rather than forgive and forget.	91 (15.1)	510 (84.9)
7	I am always courteous, even to people who are disagreeable.	509 (84.7)	92 (15.3)
8	I have never been irked when people expressed ideas very different from my own.	200 (33.3)	400 (66.7)
9	There have been times when I was quite jealous of the good fortunes of others.	306 (50.9)	295 (49.1)
10	I am sometimes irritated by people who ask favours of me.	204	328

		(33.9)	(66.1)
11	I have never deliberately said something that hurt someone's feelings.	328	272
		(54.7)	(45.3)
12	There have been times when I felt like rebelling against people in authority even when I knew they were right.	209	392
		(34.8)	(65.2)
13	On a few occasions, I have given up doing something because I thought too little of my ability.	299	301
		(49.8)	(50.2)

Note: Socially desirable responses are in bold.

Question One: Do certain factors influence levels of social desirability?

In order to assess if any demographic variables contributed to social desirability scores, univariate regression analyses were performed on several variables that were identified as having the potential to increase or decrease levels of social desirability: perceived financial strain, the child's BMI, the mother's BMI, the child's age, the mother's age, and the mother's education level.

Perceived financial strain was calculated by combining each participant's scores on the responses to two statements: 'Our income never seems to match up with our expenses', and 'Think back over the past 12 months. How much difficulty would you say you had in paying bills?'. Regression analysis revealed that a family's perceived level of financial strain predicted social desirability scores, $R^2 = .017$, $F(1, 598) = 10.087$, $p < .01$. Coefficient analysis revealed that social desirability scores increased by 0.160 as individuals reported lower levels of financial strain.

Univariate regression analysis revealed that the child's body mass index did not predict social desirability scores ($R^2 = .003$, $F(1, 599) = 1.99$, $p > .05$), nor did the body mass index of the parent completing the measure ($R^2 = .004$, $F(1, 582) = 2.18$, $p > .05$). Age was also found to have no significant impact, with neither the child's age ($R^2 = .003$, $F(1, 599) = 1.631$, $p > .05$) nor the mother's age ($R^2 = .000$, $F(599, 1) = 0.035$, $p > .05$), predicting social desirability scores. Univariate analysis of variance indicated no difference in mean levels of social desirability according to education level ($F(2, 516) = .795$, $p > .05$).

Question Two: Do levels of social desirability predict reported levels of the five health behaviours?

It was hypothesized that parents high in social desirability would score significantly differently on five variables: sleep duration, sweet drink consumption, exercise duration,

screen time, and fruit and vegetable intake. It was also hypothesised that this difference would be the most evident in exercise duration and fruit and vegetable intake due to their heightened exposure. To assess this, a regression analysis was used to establish the extent to which social desirability influenced the individual's score on each of these variables.

Univariate regression analysis revealed that social desirability scores did predict parental reporting of child's daily fruit and vegetable intake ($R^2 = .007$, $F(1, 599) = 4.441$, $p < .05$). Coefficient analysis indicates that as social desirability scores increased by one point, reported daily intake of fruits and vegetables increased by .04.

Univariate regression analysis revealed that social desirability scores did not predict parental reporting child's daily sleep duration, daily sweet drink consumption, daily activity levels, or daily hours of screen time (all $F < 1.360$).

Question Three: Do participants high in social desirability under-report their child's weight?

It was also hypothesized that parents high on social desirability would report that their children have lower weight statuses, and would show the greatest difference between reported child weight status and the child's actual weight status.

Perceived weight statuses were scored between 1 (underweight) to 5 (overweight). Frequencies for perceived weight status can be seen in Table 4. Univariate analysis of variance indicated no difference in mean levels of social desirability according to perceived weight status ($F(4, 596) = 1.085$, $p > .05$).

Table 4. Frequencies and mean social desirability scores for perceived weight category.

Score	Descriptor	<i>N</i>	Percentage	Mean SD score
1	Underweight	15	2.5	8.13
2	A little underweight	76	12.7	8.11
3	About right	445	74.0	8.70
4	A little overweight	53	8.8	8.45
5	Overweight	12	2.0	8.58

Actual weight statuses were scored between 1 (below average) to 5 (very obese).

Frequencies for perceived weight status can be seen in Table 5. Univariate analysis of variance indicated no difference in mean levels of social desirability according to actual weight status ($F(4, 596) = .450$, $p > .05$).

Table 5. Frequencies and mean social desirability scores for actual weight category.

Score	Descriptor	Percentile	<i>N</i>	Percentage	Mean SD score
1	Below average	< 3	3	0.5	6.67
2	Average	3-85	459	76.4	8.59
3	Overweight	95-95	89	14.8	8.64
4	Obese	95-97	16	2.7	8.50
5	Very obese	> 95	34	5.7	8.59

In order to assess whether social desirability predicted the difference between reported child's weight status and actual child's weight status, the difference between these two was calculated. While both used five-point scales, Tables 3 and 4 illustrate that the points were not the same for each; for example, a '3' in the perceived weight scale related to 'about right' but to 'overweight' in the actual weight scale. To achieve more reliable results each of the scales was therefore recoded using four categories: 'underweight', 'healthy range', 'overweight', and 'very overweight', ('a little overweight' in the perceived weight scale was recoded to 'overweight' in the new scale, and 'overweight' recoded to 'very overweight'). Frequencies for these can be seen in Table 6.

Table 6. Frequencies and mean social desirability scores for four-point weight status differences.

Score	Explanation	<i>N</i>	Percentage	Mean SD score
-2	Actual weight status is two points less than perceived weight status	1	.02	7
-1	Actual weight status is one point less than perceived weight status	11	1.8	8.82
0	Actual weight status is the same as perceived weight status	398	66.2	8.67
1	Actual weight status is one point more than perceived weight status	169	28.1	8.37
2	Actual weight status is two points more than perceived weight status	22	3.7	8.77

The majority of parents correctly estimated their child's weight status, but when they were incorrect they were more likely to under-estimate than over-estimate weight. The difference in social desirability between the scores was not significant ($F(5, 596) = .578, p > .05$), indicating that there was no difference in social desirability levels between those who under- and over-estimated their child's weight status.

Question Four: Is responding more congruous with weight status in those with lower social desirability?

Finally, it was hypothesized that there would be a larger discrepancy between reported sleep duration, sweet drink consumption, exercise duration, screen time, and fruit and vegetable intake, and children's weight status in those with higher levels of social desirability. To analyse this, social desirability was split into three groups: low, medium, and high, and BMI was split into healthy range, overweight, and obese, then analysed using a two-way independent ANOVA for each of the five factors.

For sleep, there were no main effects of either social desirability or BMI ($F(2, 591) = .198, p > .05$ and $F(2, 591) = 1.491, p > .05$ respectively), however, a significant interaction between the two was observed ($F(4, 591) = 3.244, p < .05, \eta_p^2 = .021$). Post-hoc analysis revealed that in the low social desirability group, parents of overweight children reported that their children slept for significantly longer each night ($M = 695.85$ minutes, $SD = 49.58$) than parents of obese children ($M = 642.60$ minutes, $SD = 44.12$; $LSD = .003$) and parents of children with healthy range weight ($M = 660.69$ minutes, $SD = 52.34$; $LSD = .003$). The differences between reported minutes of sleep by parents of obese and healthy range children were not significant, and there were no significant differences between any of the weight categories in the medium or high social desirability groups.

For screen time, both social desirability and BMI had main effects ($F(2, 591) = 5.077, p < .01, \eta_p^2 = .017$, and $F(2, 591) = 4.977, p < .01, \eta_p^2 = .017$ respectively). These are best understood in light of the significant interaction between the two ($F(4, 581) = 2.729, p < .05, \eta_p^2 = .018$). Post-hoc analysis revealed that in the low social desirability group, parents of obese children reported more screen time per day ($M = 172.50$ minutes, $SD = 87.52$) than parents of overweight children ($M = 103.94$ minutes, $SD = 55.98$; $LSD = .002$), and parents of children with healthy range weight ($M = 96.42$ minutes, $SD = 64.64$; $LSD = .000$). The differences between reported minutes of screen time by parents of overweight and healthy

range children were not significant, and there were no significant differences between any of the weight categories in the medium or high social desirability groups.

For fruit and vegetable intake, there was a main effect for social desirability ($F(2, 591) = 3.082, p < .05, \eta_p^2 = .010$) but not for BMI and no interaction between the two. Post-hoc analysis revealed that those in the low social desirability group reported significantly lower fruit and vegetable intake ($M = 4.13, SD = 1.16$) than those in the medium ($M = 4.36, SD = 1.15, LSD = 0.04$) and high ($M = 4.40, SD = 1.25, LSD = .04$) social desirability groups. There was no significant difference between the medium and high groups.

For sweet drinks and exercise, none of the main effects were significant, nor were either of the interactions (all $F < 2.073$).

Discussion

This research aimed to investigate the relationship between social desirability and parental reporting of children's weight status and a number of other variables. Based upon a culmination of previous literature, there were four key research questions.

Question One: Do certain factors influence levels of social desirability?

The first area of interest involved exploring how social desirability manifests in New Zealand parents, and assessing factors that may contribute to this. Several factors were identified as having the potential to influence parents' levels of social desirability: perceived financial strain, the child's BMI, the mother's BMI, the child's age, the mother's age, and the mother's education level. Previous literature had found conflicting results in terms of how some of these factors influence social desirability; some had never been investigated; and none had looked at how factors to do with children may influence the social desirability of parents.

Analysis revealed a significant negative relationship between social desirability scores and perceived financial strain. This indicates that in the current sample, higher social desirability scores corresponded with lower reported perceived financial strain, or with higher perceived affluence. This finding was consistent with the hypothesis that perceived financial strain would have a negative relationship with social desirability. This was based upon research that found that those with lower financial strain were more likely to engage with health services and spend more time connected to media through the internet, thereby increasing the likelihood of their exposure to positive health messages (Adler, et al., 1993; Wangberg, et al., 2008).

Alternately, or perhaps additionally, research has found that obesity is significantly more prevalent in areas of high deprivation (Tobias, Paul, Yeh, & New Zealand Ministry of Health, 2006) which may lead parents living in these lower socio-economic areas to view having overweight children as more acceptable than where it is a less common issue. Overweight individuals who are more often exposed to others with similarly high or higher BMIs are less likely to recognize their own weight issues (Maximova, et al., 2008). Therefore, it may not be as desirable to be a healthy weight in lower socio-economic areas as it is in more affluent ones. Thus, individuals experiencing high levels of financial strain may not feel as much need to misrepresent themselves in the current setting.

This finding has potential ramifications for individuals working with families in a professional context. Parents or families not experiencing financial strain may feel the need to paint themselves in a more favourable light, and may not be so willing to admit to behaviours that they consider to be undesirable. This has implications for practitioners, especially those in medical or psychological services, where individuals may need to disclose potentially undesirable information about their families in order to get the best quality of care. While the present study is focused around weight, it is possible that this tendency for those experiencing less financial strain to misrepresent themselves generalizes across many other settings.

The finding that financial strain has a negative relationship with social desirability needs to be interpreted cautiously, however, due to the cross-sectional nature of the study and the self-report nature of the financial strain measure. Because no objective measure of financial strain was collected, it cannot be said for certain whether reported levels of strain were accurate. Therefore, it is impossible to know whether lowered financial strain leads to higher social desirability, or whether higher social desirability leads to lowered reporting of financial strain. Given the social pressure to portray oneself as affluent (Christopher et al., 2005), this finding may potentially be at least partially a reflection of the latter.

There was no relationship between social desirability levels and any of the other predicted factors (the child's BMI, the mother's BMI, the child's age, the mother's age, or the mother's education level). The finding that there was no difference in social desirability levels between mothers with varying levels of education contributes to a growing body of literature that is consistently publishing different findings in this regard. Some studies, such as the present one, have found no relationship (Carels, et al., 2006), while others have found a positive relationship (Hebert, et al., 2001) and others have found a negative relationship (Heerwig & McCabe, 2009). The finding of no difference in the present sample may be a

reflection of the salience of the positive health movements across all levels of education in New Zealand at present, both from a government and societal level. This means that higher levels of education are not required to have sufficient exposure to, or understanding of, health-promoting material for it to activate an individual's social desirability in a health setting. This is also a positive reflection of the fact that health messages may now be filtering down through primary and secondary schools, meaning that one does not need a high level of educational attainment to be exposed to them. This could be due to the increased number of active health intervention promotions in schools, particularly those in lower socio-economic status areas, such as Fruit in Schools (Ministry of Health, 2009a).

The finding that there was no relationship between the child's age, maternal age, the child's or maternal BMI and social desirability levels indicates that social desirability was a stable trait within participants which was not more or less activated based upon these factors. The increased pressure parents may have felt in presenting to a health service with a high BMI child, or while having a high BMI themselves did not influence their willingness to respond honestly to undesirable statements about their behaviour, nor did any beliefs they may have held about 'puppy fat'. This has both positive and negative implications for practitioners: while it means they do not have to take these factors into account when collecting behavioural data from parents, it may be beneficial to be able to identify those at higher risk of misrepresentation based upon easily observable measures. As it stands, however, it appears that only low perceived financial strain can be used to cautiously anticipate the presence of social desirability.

As this is one of the first studies to look at levels of social desirability in parents in New Zealand, particularly when in a context based around their child, all of these findings require replication in order to rule out any anomalies in the present sample.

Question Two: Do levels of social desirability predict reported levels of the five health behaviours?

The second research question looked at whether social desirability influenced reporting of five health behaviours identified by previous literature as having a bearing on weight status in children: fruit and vegetable intake, screen time, exercise, sleep duration and sweet drink consumption. Based on the literature which indicated that social desirability predicted individuals' reporting of their own health behaviours (Adams, et al., 2005; Hebert, et al., 1997), and the finding that parents frequently incorrectly report their children's weight

(Baughcum, et al., 2000), it was hypothesised that parents who displayed higher levels of social desirability would be more likely to answer ‘desirably’ – that is, report higher fruit and vegetable intake, lower screen time, higher levels of exercise, longer sleep duration and lower sweet drink consumption – than their low social desirability peers. However, given the relative exposure to recommendations from health professionals, it was also hypothesised that this difference would be the most salient for fruit and vegetable intake and exercise, and less so for sweet drink consumption, screen time and sleep duration.

This hypothesis held true for only one of these health behaviours: fruit and vegetable intake. There was a significant positive relationship between social desirability scores and the number of fruits and vegetables parents reported their child eating each day. There was no significant relationship between social desirability scores and the other four health behaviours.

This finding is perhaps best explained by anecdotal evidence obtained during the feedback sessions. When recommended levels for each of the five behaviours were provided to parents, the only one that was frequently recognized was fruit and vegetable intake, presumably through the extensive, nationwide ‘Five Plus A Day’ campaign (5+ A Day, 2011a). For the other behaviours, parents were largely either unaware of recommended levels, or confused as to what these were – for example, mistakenly believing that the ‘Push Play For 30 Minutes a Day’ campaign (Sport and Recreation New Zealand, 2011) which was aimed at adults was also the recommendation for children, whereas the recommendation for children is actually 60 minutes (Barlow & Committee, 2007). With this in mind, for the factors with no significant findings, parents may have been answering in a way in which they personally believed to be desirable. Without a universal sense of what constitutes desirable responding, however, no pattern was found. Alternatively, parents may not have even been aware that the lesser-known of these behaviours contributed to childhood obesity, and thus may not have felt the need to answer in a desirable way.

No previous literature has looked at how social desirability impacts parental reporting of their child’s behaviours, but these findings can be applied to previous literature in terms of parental reporting of their own behaviours. Research has found that participants high in social desirability misrepresent themselves on many measures of health behaviours, including caloric input and exercise duration (Adams, et al., 2005; Hebert, et al., 1997). However, in previous literature, the reporting of these behaviours was found to be socially desirable through their contrast with actual objective measures, which were not available in the current study.

The implications of finding a significant relationship between social desirability and fruit and vegetable intake are two-fold. First, it both highlights, and throws into question, the effectiveness of nationwide campaigns, such as ‘Five Plus A Day’ (5+ A Day, 2011a). While parents were clearly aware of the recommend levels, the fact that there was a difference in responding between lower and higher social desirability groups indicates that while parents are taking this information on board, they may not actually be altering their behaviour. If you consider lower social desirability to be the most ‘honest’ responding, these participants were reporting significantly lower levels of fruit and vegetable intake than those with higher social desirability scores. Therefore, while the campaign has heightened awareness and education, it may not have had as much impact on behaviour change as what is reported in the general population.

The second implication is that providing parents with recommendations may actually mask any changes that are happening for higher socially desirability participants. By providing participants with an ‘ideal’ number or level to aim for, practitioners may simply be providing higher social desirability participants with a figure to report, which may prevent the genuine reporting of actual behaviour change. This may be circumvented by simply suggesting an ‘increase’ or ‘decrease’ of a certain behaviour, in the hope that without a standard to aim for, participants would be more likely to give an answer more representative of the truth.

The lack of a finding in regards to exercise duration also has implications for health professionals. Unlike for fruit and vegetable intake, where mean levels of reporting were lower than recommended levels, the mean reported duration of exercise across all children was actually twenty minutes higher than recommended levels. While, without objective measures, it cannot be known if this is accurate or not, what this may indicate is that parents are genuinely unable to accurately estimate their children’s exercise levels, or that they over-estimate the intensity of their children’s exercise. Therefore, when providing feedback to parents about exercise levels, practitioners need to make it clear both the quality of the exercise that is needed, as well as the quantity. Parents may also need education about how much moderate intensity exercise children do on a daily basis at school, so they know to what extent that needs to be supplemented at home.

Question Three: Do participants high in social desirability under-report their children’s weight?

The third research question involved looking at parental estimations of children's weight statuses, and whether these were congruous with their actual status. Given a lack of directly relevant research, hypotheses were based upon the literature that social desirability responds to what is currently highlighted as socially acceptable (Twenge & Im, 2007), combined with the literature highlighting the high levels of discrimination against obese individuals (Puhl, et al., 2008), as well as the literature stating that parents are generally inaccurate at reporting their children's weight statuses (Baughcum, et al., 2000). It was hypothesised that parents with social desirability scores would report that their children have lower weight statuses, and would produce the greatest difference between their report of the child's weight status and the child's actual weight status. Neither of these hypotheses were supported by the study, with no significant differences in social desirability levels found for either reporting of perceived weight statuses, or differences between actual and perceived weight statuses.

The lack of relationship between social desirability and perceived weight status is surprising. This could reflect the fact that the vast majority of children in the sample – over three quarters – were of a healthy weight. This means that reporting a child as having a healthy weight is both the most realistic and the most desirable option. This may have hidden any potential social desirability biases that were truly present. It may also be due to the fact that the overweight categories were labelled using very moderate terms ('a little overweight' and 'overweight') as opposed to more emotive terms such as 'very overweight' or 'obese', despite these terms more closely representing the weight status of some children in the study.

The lack of difference in social desirability between those that under- and over-estimated their child's weight status was also unexpected. This could be due to two key reasons. First: in the present sample, far more parents correctly estimated their child's weight status than would be indicated by previous literature, which found far lower levels of accurate responding (Baughcum, et al., 2000; Carnell, et al., 2005). This could be due to the fact that the perceived weight scale was labelled differently to the actual weight scale and therefore direct comparison was difficult. In the comparisons, parents who perceived their children were 'a little overweight' were rated as correct if their child fell into the 'overweight' category, which is between the 85th and 95th percentile, and parents who rated their child as simply 'overweight' were rated as correct if their children fell into the 'obese' category, which is between the 95th and 100th percentile. Thus, a lot of leeway was provided for parents to internally under-estimate their child's weight status while still having their answers rated as correct. A clear way to address this issue in the future is to use the same

measure to ascertain parent's perceived weight status as will be used to measure their actual weight status. The issue here will be finding wording that is both likely to elicit truthful responses from parents, while still accurately representing the weight status of the child.

The second potential reason is the self-selecting nature of the sample. Only 53% of the initial sample gave verbal consent to participate in the study, and not all of those who gave consent participated in the health check. It was made very clear in all information inviting parents to participate in the study that it was a growth study measuring weight in children. Bearing what is known about social desirability, those who were unwilling to admit that their children were overweight may simply have declined to participate in, or withdrawn from, the study. Those who are truly unwilling to admit to behaviours they perceive as being undesirable in the context of the study may potentially find it easier to simply decline rather than come along and misrepresent themselves. This is an inevitable pitfall of any research that involves participants responding to an invitation to participate, and is avoidable only by doing these measurements as a compulsory part of children's development. Worth noting also, while not a part of the present research, is the unexpectedly high level of uptake into intervention following the delivery of the child's weight status. This potentially reflects a disparity between what individuals considered to be socially desirable: those who placed higher importance on impression management around weight issues may have avoided the study, whereas those who perceived being invested in their child's recovery as more desirable may have presented and responded honestly. This is a reflection on the highly personal and individual nature of social desirability, in that participants can only respond in the way that they personally perceive to be the most socially acceptable.

A final potential reason may be the lack of social desirability present in exercise responding. Previous literature has found that mothers are more likely to rate their children as having a healthy weight if they perceive that their diet and exercise were at acceptable standards, regardless of their BMI (Jain, et al., 2001). Therefore, it could be hypothesised that it was the parents who rated their overweight children as having high levels of exercise who incorrectly rated them as having a healthy weight, and that social desirability did not play a role in this relationship.

Question Four: Is responding more congruous with weight status in those with lower social desirability?

The final research question looked at whether social desirability and children's weight statuses interacted to predict reported the five health behaviours measured previously: fruit

and vegetable intake, screen time, exercise, sleep duration and sweet drink consumption. It was hypothesised that reports would be more accurate in the low social desirability group – that is, reported behaviours would be more congruous with actual weight status than they will be in the high social desirability group, especially for fruit and vegetable intake and exercise duration due to their higher media exposure.

For sleep, neither social desirability nor BMI had a significant main effect. However, there was a significant interaction: in the low social desirability group, parents of overweight children reported that their children slept for significantly longer each night than parents of obese children and parents of children with weight in a healthy range. The differences between reported minutes of sleep by parents of obese and healthy range children were not significant, and there were no significant differences between any of the weight categories in the medium or high social desirability groups.

This is a surprising finding that requires replication. Given that the difference only exists in the lowest social desirability group, the answers provided should, in theory, have been the most accurate to actual practices. However, the finding that overweight children slept more than both healthy weight and obese children does not seem to fit with the finding that shorter sleep durations contribute to childhood obesity (Cappuccio, et al., 2008). However, it is worth noting that the sleep durations of all three groups fell within the recommended levels, so a difference in weight status may not necessarily be expected. Furthermore, the lack of main effects indicates that this may have simply been an anomaly in the data.

For screen time, it was found that parents in the high and medium social desirability groups all reported that their children spent similar lengths of time doing screen-based sedentary activity, regardless of their weight status. However, in the low social desirability group, parents with obese children reported significantly longer screen time than those with healthy range or overweight children.

This finding is consistent with both the theory that low levels of social desirability represent the most ‘honest’ responses, and the theory that high levels of sedentary time are detrimental to children’s health. In this sample, the parents of obese children who were found least likely to misrepresent themselves based on the social desirability measure were also more likely to report higher levels of screen time – over an hour longer per day than those with children whose weight fell into the healthy range, or who were overweight.

The concern here is that the differences in reporting disappear as levels of social desirability increase. Even in the medium social desirability group, there were no significant differences in reported screen time between children in each of the three weight categories.

This may reflect the fact that excessive screen time, while never the focus of any public health campaigns, has received widespread media and societal criticism. It could be, then, that medium and high social desirability parents were not concealing levels of screen time due to their knowledge of the health risks, but due to wanting to be perceived as a parent who encouraged non-screen based, creative play. Thus, only parents with very low levels of social desirability reported levels of screen time congruous with their child's weight status, potentially without even being aware that the two were linked.

For fruit and vegetable intake, there was a main effect for social desirability but not for weight status, and there was no interaction between the two. In the low social desirability group, parents reported significantly lower fruit and vegetable intake than those in the medium and high social desirability groups. There was no significant difference between the medium and high groups. This finding essentially mirrors the linear relationship between social desirability and fruit and vegetable intake found in earlier analyses. It is interesting to note, however, the lack of an interaction between social desirability and weight status: low social desirability parents reported lower fruit and vegetable intake even in healthy range children. This may indicate, as with screen time, that parents were not attempting to hide contributing factors to unhealthy weight, but factors that may reflect badly upon their efficacy as parents.

For sweet drinks and exercise, there was no difference in reporting of either behaviour in parents in any of the three social desirability groups, regardless of the weight status of the child. This indicates that individuals reported similar levels of these behaviours regardless of their levels of social desirability or their child's weight status, and that reporting did not differ between those with children in different weight status groups depending on their levels of social desirability.

The lack of a main effect or interaction for exercise is unexpected, given that it was one of the factors recognised as most likely to generate differences based upon social desirability due to high levels of media exposure. However, as previously discussed, all participants in all groups reported far higher exercise durations than the recommended levels, reflecting what may genuinely be a misunderstanding of what constitutes a sufficient level of exercise to help overcome obesity, rather than misrepresenting themselves to be socially desirable. Alternately, it may be that the importance of exercise is so widely known that parents responded desirably regardless of their MCSDS score: even parents that generally do not respond in a desirable way may have felt pressure to over-state their child's exercise levels in the present health setting.

Limitations

There are some potential issues in the study as a whole. The first is the relatively low effect sizes for all of the significant results. Each significant result contributed only between one and two percent of all the variability associated with each variable. This reflects the complex nature of childhood obesity: a huge number of contributing factors need to converge to facilitate its development. Furthermore, in the current research, no objective measures were used to measure actual levels of each behaviour, so it cannot be said for certain when social desirability was implicated and when it was not. It is possible to make assumptions based upon weight: that is, that low levels of responding represent social desirability when they are incongruous with weight status. However, in the current research, despite choosing behaviours with a strong evidence base as contributing to childhood obesity (Barlow & Committee, 2007; Cappuccio, et al., 2008), weight status often had no main effect, potentially indicating that these behaviours did not contribute to levels of obesity in the current sample, or that additional factors were influencing levels of reporting, other than social desirability.

The issues around the self-selecting nature of the sample have already been briefly discussed, but represent a huge problem both in the current research and in health research in general. Anecdotally, parents that participated in the health check were very eager to move through to the intervention stage, which was reflected by the higher than expected uptake into intervention. This indicates that the parents who agreed to take part were already aware and accepting of their children's health issues and motivated to change.

Another potential issue is the use of the short form of MCSDS. Because of the high load already placed on participants by the extensive health check questionnaire, it was decided that a short form of the scale would be best in the present research. Ideally, however, the full-length version would be used in order to make the differences in levels more apparent and allow for more extreme comparisons. Despite the fact that the paper originally introducing the short form used in the current research finding a relatively high Cronbach's alpha (Reynolds, 1982), the present study failed to replicate this finding, indicating that the measure may not have been as reliable in the current sample. Therefore, both to allow for better comparisons, and to increase the reliability of the measure, the full form should be used wherever possible.

A further potential issue in the present study is that many participants were parents with multiple children taking part in the study. These participants often had children who fell into different weight categories and were different ages. Therefore, one social desirability

score may represent a number of children, of different weight statuses. This is problematic as it may disguise any possible interactions between weight status and social desirability.

One final possible caution is that this is the first study looking at how social desirability may impact parental reporting of children's behaviours. Therefore, replication of all findings is needed in order to ensure they do not represent patterns or characteristics specific to the current sample. This is especially important before generalising to an international level, as social desirability, parenting and weight issues may manifest differently in New Zealand culture.

Conclusions

Overall, the present research aimed to investigate the relationship between social desirability and reporting of health behaviours in parents of New Zealand children. The results were mixed, reflecting the complex nature of both social desirability and childhood obesity. It was found that individuals with low levels of social desirability were more likely to report screen watching duration more congruous with their child's weight status, and fruit and vegetable intake further away from nationally recommended levels. Furthermore, it was found that social desirability had a negative relationship with perceived financial strain. However, no significant results were found regarding social desirability and reporting of children's weight statuses, which was hypothesised to be present. Nor was there a significant impact of social desirability on parental reporting of children's exercise levels.

These findings can assist medical and mental health professionals interpret behavioural information provided to them by parents that seems incongruous with their child's weight status, particularly if the individual is from an affluent family or the behaviour which they are describing has clearly outlined levels or guidelines. Bearing this in mind, it is essential for practitioners to understand the immense pressure parents are under to raise healthy children, both from medical professionals and from society as a whole. Adding to this pressure by providing more standards for them to adhere to may be less helpful than supporting this desire to be a good parent by encouraging existing behaviours and highlighting their benefits for the child health. Changing the health of the child needs to be promoted as more socially desirable than adhering to levels of recommended behaviours, as the latter is easier to misreport and less likely to actually result in positive change for the child.

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Appendix A: Social desirability questionnaire

Section 7: A little about you.

You've answered a lot of questions about your child and life at home. Now we'd like to know a bit more about you as a person. Below are thirteen statements that are true of some people, but not true of others. Read each item and circle whether the statement is *True* or *False* as it relates to you personally.

1. It is sometimes hard for me to go on with my work, if I am not encouraged.	True	False
2. I sometimes feel resentful when I don't get my way.	True	False
3. No matter who I'm talking to, I'm always a good listener.	True	False
4. There have been occasions when I took advantage of someone.	True	False
5. I'm always willing to admit it when I make a mistake.	True	False
6. I sometimes try to get even rather than forgive and forget.	True	False
7. I am always courteous, even to people who are disagreeable.	True	False
8. I have never been irked when people expressed ideas very different from my own.	True	False
9. There have been times when I was quite jealous of the good fortune of others.	True	False
10. I am sometimes irritated by people who ask favors of me.	True	False
11. I have never deliberately said something that hurt someone's feelings.	True	False
12. There have been times when I felt like rebelling against people in authority even though I knew they were right.	True	False
13. On a few occasions, I have given up doing something because I thought too little of my ability.	True	False

Appendix B: Dietary questionnaire

6 How many servings of fruit would your child usually eat each day?
(count 1 serve as the amount that would fit in the palm of their hand)

- ☐ My child doesn't eat fruit
- ☐ ½ serve
- ☐ 1 serve
- ☐ 1½ serves
- ☐ 2 serves
- ☐ 2½ serves
- ☐ 3 or more serves

7 How many servings of vegetables would your child usually eat each day?
(count 1 serve as the amount that would fit in the palm of their hand)

- ☐ My child doesn't eat vegetables
- ☐ ½ serve
- ☐ 1 serve
- ☐ 1½ serves
- ☐ 2 serves
- ☐ 2½ serves
- ☐ 3 or more serves

8 How many glasses of sweetened drinks would your child usually have each day?
(include fizzy, fruit juice, fruit drinks, cordial and energy drinks)

- ☐ None or less than ½ drink
- ☐ ½ drink
- ☐ 1 drink
- ☐ 2 drinks
- ☐ 3 drinks
- ☐ 4 or more drinks

Appendix C: Exercise questionnaire

- 1** How long would your child *usually* spend each day being active enough to *puff or sweat* (eg. riding their bike, swimming, playing sport, being on the trampoline etc)?

_____ minutes on a **week** day AND _____ minutes on a **weekend** day

- 2** Compared to other children of the same age and sex how would you rate your child's level of physical activity?

- ☐ Much less active
- ☐ A bit less active
- ☐ About the same
- ☐ A bit more active
- ☐ Much more active

- 3** How long would your child usually spend watching TV each day (including DVDs or videos)?

_____ minutes on a **week** day AND _____ minutes on a **weekend** day

- 5** How long would your child usually spend playing video games each day (Xbox, Nintendo Wii, Playstation, computer, internet)?

_____ minutes on a **week** day AND _____ minutes on a **weekend** day

Appendix D: Perceived weight and concern questionnaire

25 Compared to other children of the same age and sex, how would you rate your child's weight?

- ☐ Underweight
- ☐ A little underweight
- ☐ About right
- ☐ A little overweight
- ☐ Overweight

26 How concerned are you about your child's weight?

- ☐ Not at all concerned
- ☐ Not concerned
- ☐ A little concerned
- ☐ Quite concerned
- ☐ Very concerned

Appendix E: Demographic information questionnaire.

Section 5: Demographics

All families experience economic pressures every now and then. Please think about your family's current economic situation and answer the following questions.

103 Compared to one year ago, would you say your standard of living today is:

- ☐ Much higher than one year ago
- ☐ Somewhat higher than one year ago
- ☐ About the same
- ☐ Somewhat lower than one year ago
- ☐ Much lower than one year ago

104 Our income never seems to match up with our expenses

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly agree

105 Think back over the past 12 months. How much difficulty would you say you had in paying bills? *Would you say you had....*

- ☐ A great deal of difficulty
- ☐ Quite a bit of difficulty
- ☐ Some difficulty
- ☐ A little difficulty
- ☐ No difficulty

106 Think back over the past 12 months. *Generally at the end of each month did you end up with.....*

- ☐ More than enough money left over
- ☐ Some money left over
- ☐ Just enough to make ends meet
- ☐ Not enough to make ends meet

107 Mothers - what is **your** highest level of education? *Please tick one circle only*

- ☐ Primary school
- ☐ Some high school
- ☐ School Certificate or NCEA Level 1
- ☐ Sixth Form Certificate or NCEA Level 2
- ☐ Bursary or Higher School Certificate or NCEA Level 3
- ☐ College of Education Certificate
- ☐ Polytechnic Diploma
- ☐ University Degree
- ☐ Other (please describe)

108 To which ethnic group(s) does your child belong to? *Please tick all the boxes that apply*

- ☐ NZ European
- ☐ Maori
- ☐ Samoan
- ☐ Tongan
- ☐ Cook Island Maori
- ☐ Niuean
- ☐ Chinese
- ☐ Indian
- ☐ Other (such as Dutch, Japanese, Tokelauan). Please state:.....

109 If Maori, please provide your tribal affiliations

..... or Not applicable

110 Is your child descended from Maori (that is do they have a Maori birth parent, grandparent or great-grandparent etc)?

- ☐ Yes
☐ No
☐ Don't know

Questions 113 to 116 ask about the height and weight of your child's birth mother and father. We would like to measure you in the clinic if possible, otherwise please record your height and weight and that of your child's birth father.

113 Mother: How tall are you without shoes? _____ cm or _____ feet
 _____ inches

☐ Measured ☐ Estimated

114 Mother: How much do you weigh? _____ kg or _____ stone
 _____ lbs

☐ Measured ☐ Estimated

115 Father: How tall are you without shoes? _____ cm or _____ feet
 _____ inches

☐ Measured ☐ Estimated

116 Father: How much do you weigh? _____ kg or _____ stone
 _____ lbs

☐ Measured ☐ Estimated