Early Eating Patterns of Women with Eating Disorders

Constanze Anja Schulz

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I hereby declare that the following thesis is my own work and has not been submitted for any other degree or qualification.

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Abstract

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AIM: Anorexia, bulimia and obesity have become a problem for increasing numbers of females of all ages. Like eating itself, pathological eating patterns can be regarded as products of historical, societal, family and individual factors. The aim of the present study was to explore whether early experiences with food and eating influenced women's eating patterns in later life and furthermore if there are specific aspects of socialisation in regards to food which are associated with the development of a specific form of eating disorder. **METHOD:** The retrospective accounts of women with anorexia nervosa (n=18), bulimia nervosa (n=21) or severe obesity (n=18) were compared with those of women without an eating pathology (n=20). A semi-structured interview was conducted in addition to self-rating questionnaires about current eating behaviour (EDI, EAT, BITE) and relationships with parents and peers during childhood (PBI, PARTS). The data was analysed using quantitative and qualitative methods. **RESULTS:** The families of the four sub-groups differed surprisingly little concerning food and eating. However, significant differences in the informants' relationship with their mothers were found, with the eating disordered women describing their mothers as less caring and more overprotective. In addition there was a positive correlation between this parenting style of 'affectionless control' and severity of eating pathology. Qualitative analysis underlined that the sub-groups differed not only in their experience of parental control but also in how they responded to it. Body shape as a child emerged as an important factor in interview and questionnaires. Heavier weight in childhood was associated with earlier onset of dieting and persistent negative body image. All three eating disordered sub-groups described themselves as being heavier as children and reported more size related teasing by peers and (in particular male) family members. **CONCLUSION:** The literature reviewed and the present study add further weight to the evidence of a link between early eating related experiences and the later manifestation of eating problems. However the link between socialisation in regards to food and eating and the development of a specific form of eating disorder is more tentative.

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1. Introduction

What does it take to make a person either voluntarily endure starvation, binge eat beyond physical discomfort or to adopt an eating pattern which is associated with severe health risks as well as social stigmatisation?

This question has gained increasing relevance in recent years as disturbed eating patterns have reached alarmingly high proportions. Behaviours like self-induced vomiting, bingeing, laxative abuse, and dieting are widespread and 2-4% of young females fulfil diagnostic criteria for anorexia or bulimia (Hoek 1993). In addition, dramatically increased prevalence rates of obesity can be observed throughout the Western world (Dietz 2001). A particularly worrying aspect of these increases in prevalence is that more and more young children demonstrate problematic eating attitudes and behaviours. In the context of my opening question this finding indicates that early factors play a part in the aetiology of eating disorders.

Early factors consist of a wide variety of potential influences including genetic factors, early feeding interactions as well as family environment. The present study focussed on early eating related experiences of women with different eating behaviours. The aim of the study was to explore whether common factors exist which set the scene for the development of abnormal eating behaviours. In other words, I was interested in the issue if women with eating disorders experienced a different early socialisation in regards to food and eating than women who have never had an eating disorder. Furthermore I was interested if there were features, which were specific to a particular form of eating disorder.

The initial interest into these questions stemmed from previous clinical and research work with bulimic women (Schulz & Freeman 1995). Part of the initial assessment of newly referred bulimics in this previous study was a semi-structured interview that also enquired about early eating and feeding patterns. Within the interview the

bulimic women often made comments reflecting their views that they had been 'wrongly' brought up concerning food and eating. Interestingly, some women blamed their parents rigidity and strictness in regards to food, whereas others expressed the wish that their parents had been stricter or more controlling in regards to sweets or junk food. Of course, not all bulimics shared this view, but enough to make a further exploration of this area worthwhile.

When investigating the relevance of the parent-child interaction for the development of eating disorders, one cannot overlook the work of Hilde Bruch (Bruch 1974; Bruch 1978), who stressed the importance of early feeding interactions. Bruch's work was also important in directing another aspect of the present study, as she discussed anorexia and obesity as related manifestations of faulty hunger awareness. More recently there have been calls for an integration of the research and treatment of eating disorders and obesity (Brownell & Fairburn 1995). Whereas in the field of eating disorders, psychology and psychiatry have been the driving forces, medicine has been the dominant influence in the obesity field. Consequently obesity has traditionally been seen in the context of physiology and regulatory behaviour, but in contrast to anorexia and bulimia less is known about psychological components like body image, etc. In an effort to close this gap, obese women were included as one of the sub-groups of the present study. For simplicity reasons throughout this thesis I will refer to the informants with a history of anorexia, bulimia or obesity as eating disordered women. A concern about weight and shape is widespread among women and often finds its behavioural manifestation in dieting, exercising to control weight, or the use of various slimming aids. Despite this wide range of socially acceptable techniques for controlling weight, for the purpose of the present study 'normal' was defined as the absence of any past or present eating disorder as defined by the ICD-10 classification system (WHO 1992).

At the onset of the research project I intended to interview the mothers and sisters of the informants. Reports by other family members would have been useful to validate the informants' recollections and to provide more detailed information about very

early feeding practices. Unfortunately, only very few informants gave their permission to contact mothers or sisters. Some women indicated that their families were not aware of their eating problems, or that they were not really in contact with their families. However, the majority of women just stated that that they didn't want to involve their families. In addition, most of the family members who were contacted for inclusion in the study chose not to reply to the contact letter. It remains open to speculation as to why they made that decision, as I received only one negative reply. That reply was from a sister stating that she wasn't the one with an eating problem and that she would therefore only answer questions relating to her sister, but not about her own relationship with her parents. Given the very low response rate this part of the study had to be abandoned, as a meaningful analysis would not have been possible.

The present study is divided into a theoretical and an empirical part. The basis for the theoretical chapters stems from an extensive literature search utilising search engines and reference databases (e.g. Medline and Psychlit). The importance of food and eating in our lives is also reflected by the vast numbers of publications dealing with one or more facets of this subject. The following chapters will focus almost exclusively on human eating behaviour and because of cultural differences mainly Western European and North American studies will be presented. The theoretical part starts with a historical review of food and eating and its cultural context. Eating is a highly sociable behaviour, which is therefore influenced by the rules and values of the society in which it takes place. What is more, eating disorders are often described as a response to the pressures of modern society with its emphasis on slenderness and weight control. However, a complete analysis and discussion of the role of the pressures of modern society necessitates putting food and eating into historical context. Only by looking at the changes in regards to food, eating and body image can one hypothesise why, in our current society, eating disorders including obesity have obtained epidemic proportions. The first chapter therefore gives a brief review of food and eating as times have changed. Given the importance this study attributed to the early eating experiences, a particular focus was on how the concept of childhood changed and how these changes in turn influenced feeding patterns. As

Harris argued, a semi-structured interview allows the kind of flexibility that is required for exploratory and confirmatory research (Harris, et al. 1986). Consequently I chose to construct a semi-structured interview that was based on the experiences with the interviews previously used (Schulz & Freeman 1995). However to achieve at least a certain amount of triangulation of measurement, previously standardised questionnaires were used to quantify current eating behaviour and attitudes, relationship with parents, and teasing about the informant's appearance as a child. Both quantitative and qualitative data complemented each other as they provided reference points for each other within the interview situation as well as in the analysis of the data.

The methods part itself is divided into quantitative analysis, which was undertaken with SPSS®, and qualitative analysis. For the analysis of the qualitative data a software programme (NUD.IST®) was used to develop a category system and to compare text passages from the interviews linked with these categories. This combination of quantitative and qualitative approaches had the benefit of allowing flexibility not only in the field of data collection but also data analysis.

In concluding the introduction I want to mention my own changing outlook. When I started work at this research project I had only my experiences as a research worker with women who described their childhood and my own experiences as a child to base the interview on. Over the course of the project I expanded my base in so far as I became a mother myself and consequently experienced the feeding dyad 'from the other side'. Reviewing clinical descriptions and research work one often gets the feeling that it is the family's, or more specifically the mother's, fault that a girl or young women develops eating problems. Although it would be imprudent to deny the impact of maternal eating patterns and attitudes on their daughters it was never the intention of this study to lay blame on the mothers/parents. Instead the ultimate goal of all research into eating disorders is to gain information about the possible causes with the hope that improved knowledge will advance the treatment and prevention of such disorders.

2. Historical background

The use and meaning of food has to be seen in its specific historical, cultural and social context. If we are interested in the reasons for the increase of eating disorders in modern Western societies we also have to look at the changing framework in which eating has taken place. In this chapter a brief history of food and eating will be presented with the main focus on Western Europe. As the present study explores the impact of early eating experiences, this chapter also outlines the changing concept of childhood over the centuries and how those changes were reflected in changes in feeding practices. The historical background is completed by a summary of the history of obesity, anorexia and bulimia nervosa.

2.1. Food and eating in changing times

The first turning point in the eating behaviour of mankind happened with the discovery of fire (300,000 - 400,000 BC) Teuteberg 1986. Not only did fireplaces improve the quality of food, but also became the focal point for tribal clans and families. After the transition from a society of nomadic hunters and gatherers into non-nomadic farmers and stock breeders (c. 8000 BC) the division between procuring and preparation became necessary. The intensification of agricultural food production in the Greco-Roman era (800 BC - 500 AD) led to an improvement in the general availability of food. This was followed by improvements in cooking techniques and, in the larger households of the upper class, more complex meal rituals were developed. Food and diet became embedded in religious conventions. The consumption of certain foods became forbidden, whereas other foods like bread, salt, and wine were used in sacred rites.

2.1.1. The medieval diet (ca.1300-1500 AD)

The medieval diet was characterised by the instability of food supplies, vast class differences and strong religious influences. As a result, a dichotomy of "shortage and plenty", "luxury and necessity", and "fasts and feasts" evolved Mennell, et al. 1992. During this epoch, a two-meal-system existed across all social classes and regions. The first meal of the day was ideally taken at noon after many hours of hard labour, but always after devotions to God. It was emphasised that a man paid respect to god before attending to his own stomach Henisch 1976. To illustrate this point the author

narrates a story about a medieval woman who omitted to say grace or to cross herself before she nibbled on a salad leaf. Unseen by her, a devil happened to be sitting on the leaf; after she swallowed him he possessed her and had to be exorcised by a priest. The second meal of the day was supper, which was eaten after sunset. It was considered gluttonous or greedy to eat after supper and this was particularly true before fasting days. Gluttony was seen as one of the seven deadly sins; its presence put man closer to the animals than to the angels. Although moralists well into the 16th century deemed two meals per day sufficient, people found it obviously difficult to be so restrictive. The old, the sick, and the very young were always exempt from this rule, additionally labourers who had to carry out hard physical work could expect to get a meal before midday, but their employers reminded them that this was a privilege, not a right.

There were vast differences in eating pattern between social classes and food, as well as its preparation, became a significant status symbol. The wealthy elite tried to impress others of equal rank and especially poorer people with their ostentatious and lavish feasting, banqueting, and the consumption of large quantities of food. Indications of how well this elite ate are the "restrictions" which were introduced to curb extravagance among the higher dignitaries of the church. Those rules stated for example that an Archbishop should not have more than six meat dishes - or fish dishes during fasting times - followed by no more than four "second dishes" (Drummond & Willbraham 1958). Fasting fulfilled several functions: it was a form of self-discipline, a private penance for one's personal sins and a public mortification for those of society (Henisch 1976). Additional benefits were that the increased consumption of fish encouraged shipbuilding and the training of mariners as well as preserving the country's meat supply. Fasting regulations were strict, particularly during lent, when people were allowed only one meal per day. At its fullest extent fasting regulations concerned half of all days in the year with meat, fat, eggs, milk, butter, and cheese being equally forbidden. With all these restrictions it was a challenge for cooks and housewives to find satisfactory substitutes for these foods and to find 'loopholes' in fasting restrictions. Every fast was followed by a feast and to be of value each had to be deliberate and conscious; fasting due to financial

restraints was regarded not as a sacrifice but as a mere misfortune. The table of a wealthy man was expected to be opulent and plentiful as a proof of his status, and also as an assurance that there would be leftovers for distribution after meals. Eating was a highly sociable event, the whole household would eat together and prayers at the beginning and end of every meal set the tone. Medieval society believed that outward behaviour revealed the inner man; good manners therefore expressed spiritual grace. Good table manners in this epoch meant for example no gossip about bad news, talking about medical details, loud criticism of the cooking and the pointing out of flies in the food (Henisch 1976). Particularly for women it was essential not to show too great an interest in food or display any sign of overindulgence.

The majority of people, namely peasants and villagers, seldom had the opportunity to overindulge; they lived on a diet of coarse 'black bread' (made from barley, rye or bean-flour), milk, cheese, eggs, and occasionally bacon or fowl. Kitchin & Passmore state in their book 'The Scotsman's Food' that the diet of Scottish peasants was simple and stayed remarkably stable over centuries (Kitchin & Passmore 1949). It was based on cereals supplemented by varying quantities of vegetables (kale and cabbage) and dairy products. Among peasants only few families could eat meat at all and only when animals died by accident or of disease. Because agricultural communities were self-supporting, oatmeal was used most often and wheat bread was a luxury that only the rich could afford. The most common drink in medieval Scotland was ale made from barley or oats.

2.1.2. The diet of the Renaissance (ca. 1500-1800)

The increased influence of courtly culture at the beginning of the 16th century brought the end of the medieval diet. The import of sugar and spices created new and lasting changes in the taste and preparation of food. A lively trade between Europe and the New World developed, the royal courts set examples and aristocratic, and later bourgeois, families followed the latest fashion to consume exotic products. Confectionery began as a mixture between sugar and spices, and was thought to aid digestive troubles. An extravagant example for the use of the newly imported sugar

was the table set of Henry III of France (ca 1550). It was designed by goldsmiths, spun entirely from sugar and consisted of 1286 single pieces including cutlery, bread, tablecloth, plates, centrepieces, etc. (Toussaint-Samat 1992). The creation of this table set underlines how highly valued new foods were, but is also an example of food as a status symbol as it demonstrated the wealth and power of the king.

Another fundamental change was the switch to a three-meal system, which was accompanied by the introduction of hot drinks like tea, coffee, and cacao at the beginning of the 17th century. Interestingly, in Latin countries coffee quickly became the most popular drink, whereas in the Netherlands and Britain tea was the favourite of all social classes. This led to the opening of the first public teahouse in Britain in 1640. Cromwell put a special tax on tea to let the state profit from the English passion for tea, which made tea even more popular because drinking smuggled tea became a way of opposing Cromwell. In 1770 Britain was importing over 6 million pounds of tealeaves per year. A further by-product of the discovery of the New World that brought dramatic changes in eating habits was the potato. Initially it wasn't liked in 18th century Britain and was rejected as food 'only fit for Irishmen and cows' (Toussaint-Samat 1992). However, under the influence of the French Revolution it was soon recognised that providing food for the masses was an important factor in social stability, a task for which the potato was ideally suited.

In this epoch further refinements in agriculture and food preparation took place. Kitchen gardens and fruit orchards provided a previously unknown choice of fruits and vegetables. At the same time an elaboration of table manners occurred; socially defined norms and behaviour patterns were established and consequently misconduct at mealtimes was a source of shame and embarrassment (Teuteberg 1986). The French cuisine set standards for nearly all wealthy people in Europe and cookery books were published. Eating with cutlery and from individual plates became the norm in aristocratic households, and by the end of the 17th century it had reached the urban middle classes.

2.1.3. The industrial revolution (ca. 1800-1900) and its impact on the British diet

The beginning of the 19th century marked the beginning of the transition into an industrial society with radical changes. In 1801 England and Wales had a total population of 8.9 million yet only 50 years later a population of 18 million had to be fed, clothed and housed (Burnett 1989). This increase in numbers was accompanied by a massive urbanisation, which demanded changes in the provision and preparation of food. The new communities in cities and suburbs were not able to feed themselves and food needed to be transported from rural areas. This was made possible by inventions like steam engines and railways, which also allowed better management of famines because food could be transported from outside and inside the region. For the first time it became possible to transport highly perishable goods like green vegetables, eggs, and milk all over the country. As a result, restaurants opened, scientific improvements in agriculture and food preservation decreased the price of food and a food industry developed - modern mass consumption had started.

Historians disagree about improvements in the nutrition of the general population, particularly in the early stages of the Industrial Revolution. Some authors took a more optimistic view and argued that since the beginning of the Industrial revolution the average income increased and therefore people were able to obtain food in sufficient quantities (Habermas 1990). Other historians point out (with the help of contemporary import and tax statistics) that levels of consumption of specific foods did not rise without a corresponding fall in the consumption other foods. For example, when bread prices were particularly high in 1830-1850, people started to eat more potatoes and less bread (Burnett 1989). At the beginning of the 19th century the standard of living for agricultural labourers sank to a severely low level because of a decline in real income, accompanied by changes in society that led to a decline in home baking and home brewing. The newly developing urban working class needed food that was cheap, readily available and prepared for consumption and had a high energy content. The typical poverty diet consisted of white bread, margarine, sugar, jam, and sausages, accompanied by numerous cups of tea (Kitchin &

Passmore 1949). Among poor families there was no variety in food and nothing was considered except cost, around 60% of the family budget had to be spent on food.

Oddy's analysis of the working class diet during this time was based on 17 contemporary surveys of the budgets of working class families (Oddy 1976). He portrayed rather grim conditions and concluded that the average calorie intake before 1902 was only 2,099 kcal/person. The meal pattern revolved around the presence or absence of the main breadwinner (usually the man) in the house. He would have more, and more varied, food than other members of the household. It was common that the children were kept away from the table while he ate, they often received pieces of bread, which they could eat when and how they liked. Those studies reviewed pointed out that the wages paid for unskilled labour were "insufficient to provide food, shelter, and clothing adequate to maintain a family of moderate size in a state of bare physical efficiency" - and that about one third of the total population of Britain lived in these conditions of poverty.

A new and powerful middle-class developed thanks to the growth of industry, commerce and the professions. Although there were huge differences in income and status amongst this class, they had one thing in common: an income that allowed some spending above the absolute minimum necessary, and therefore permitted choice in the selection of food. Entertaining guests was an important part of public relations, and in particular dinner-parties were a unique way to show wealth and refinement, and to celebrate the 'Golden Age' of Victorian prosperity. Undoubtedly one of the icons of this era was Mrs Isabella Beeton and her work 'The Book of Household Management' (Beeton 1861) which gave instructions and advice on all aspects of running a household, including the management of servants, recipes, children's diseases and etiquette. She states very clearly the importance of dinning by saying that the "rank which people occupy in the grand scale may be measured by their way of taking their meals, as well as their way of treating their women. The nation that knows how to dine has learnt the leading lesson of progress. It implies both the will and the skill to reduce to order, and to surround with idealism and

graces, the more material conditions of human existence; and where ever that will and that skill exist, life cannot be wholly ignoble." (Beeton 1861, p 905). The following menu will give an idea of the kind of food that would have been served at a dinner for six persons:

1st Course:	*Spinach Soup, Soles à la Creme, Red Mullet.*
Entrees:	*Roast Fillet of Veal, Braised Ham and Spinach.*
2nd Course:	*Boiled Fowls and White Sauce.*
3rd Course:	*Strawberry Jelly, Swiss Cream, Cheesecakes, Iced Pudding.*
Dessert	

Dinner-parties were great ordeals for the mistress "which she could either pass with flying colours or lose many laurels" (Beeton 1861). It was the duty of the mistress to instruct the servants (who were an essential in the middle-class household), to make her guests comfortable and happy, and to retire with the other female guests to the drawing room after dinner.

If no guests were present, dinner would be simpler, but still consisted of two to three courses and would be the main meal of the day. The first meal was a rather substantial breakfast with toast, marmalade, muffins, chops and steaks, kidneys, bacon, fish and any cold meat. The luncheon was lighter and in families with a nursery the mistress would take this meal with her children. During the day there would be many occasions for tea, or as Toussaint-Samat describes the British passion with tea "during the day any social call, any happy or unhappy occasion, called for 'a nice cup of tea', to keep you going until the time for either afternoon tea, around four o'clock, with cakes, buns, sandwiches, muffins, scones, jam, etc., or high tea" (Toussaint-Samat 1992, p 597-598)

2.1.4. Food and eating in the 20th century

It seems ironic that improvements in the nutrition of the British nation were to a great extent inspired by the outbreak of the two world wars. The Inspector of Recruiting in 1914 had great difficulties in obtaining enough men of satisfactory physique for

service in the armed forces. Almost 40% of all volunteers failed the physical exam, whereas only 10% of Cambridge undergraduates were unfit for service, which demonstrates the relationship between social status and health. Given that the men were usually better fed than women and children it becomes clear that the majority of the population was chronically malnourished. The outbreak of the war made it an obligation for the government to calculate and provide the dietary requirements of human efficiency to create a Britain 'fit for heroes' (Burnett 1989). In 1916 Food Controllers controlled the availability food, all essential supplies were bought and sold at fixed prices. Sugar, dairy products, and meat were rationed but people could buy as much bread and potatoes as they wanted. Furthermore, industrial and school canteens were established to provide cheap and nutritious meals and a great part of the population actually lived better on the rationed portions than ever before.

In the period between 1866 and 1936 the real value of wages rose between 70% and 90%, which increased purchasing power. By the 1930's only one third of the family income had to be spent on food. Food producers and retailers promoted knowledge of nutrition and vitamins, which led to a growing consumption of 'health foods' like fruit, vegetables, butter, and eggs. In particular, higher socio-economic classes were influenced by this development and changed their diet to lighter and shorter meals. Only a small minority of the population was still able to have a number of servants, consequently cooking had to be simplified, canned or ready made food became popular and everyone except the lowest classes began to eat out. But even eating at home became more convenient as many cooking chores were eliminated as much of the food came out of packages (gravy, porridge, jellies, custard). The population soon became familiar with packaged food and the associated brand names (Spencer 2000).

Shortly before the outbreak of World War II (1936-1937) Sir William Crawford carried out a dietary survey on 5000 family budgets representing all social classes. He found that breakfast was now eaten by almost everyone before leaving the house. At about 1pm most people would have dinner, with meat dishes like pies, sausages or

stews popular in lower social classes and vegetables, fruits, and fish more dominant in upper social classes. Depending on social class people would have either afternoon tea with light snacks or high tea (usually meat, vegetable and pudding) when the men came home from work. The evening meal would then take place at either 7-8pm or 9-10pm. Sir William found that traditions were extremely powerful and that people showed little interest in new dietetic developments. He concluded that although a nutritionally adequate diet was possible for $^{5}/_{6}$ of the population, only $^{1}/_{2}$ actually received it.

In 1936 food rationing was re-introduced and again it was seen as a chance not only to maintain, but also to improve, the nutritional value of the British diet. The Ministry of Food gave guidance and information via demonstrations, leaflets, radio and the press. The immediate changes were a reduction in the consumption of fats, meat, sugar, fruit and shell eggs and an increased consumption of bread, milk, and potatoes. Just as in World War I, bread and potatoes remained unrationed, and the distribution schemes allowed for additional rations of proteins, minerals, and vitamins (like cod-liver oil, orange juice, milk, eggs) to young children as well as pregnant and nursing women. Industrial canteens, allotments, fortification of food, and raising of the extraction rate for flour helped to keep up with the nation's nutritional requirements. State planning was extremely successful; before the war the food supply provided on average 3000 calories per head per day, and food providing between 2800-2900 calories per head per day was available throughout the war (Kitchin & Passmore 1949). In a way, food rationing was a great leveller between social classes as the consumption of meat, eggs, fat and sugar and total energy intake fell dramatically in better-off families whereas for poorer families egg and milk consumption rose substantially. Additionally the vegetable consumption peaked sharply for all socio-economic classes (Nelson 1993). Another measure of the success of this strategy was the fact that infant mortality declined throughout the war and the general health of children improved (Spencer 2000).

Food rationing lasted until 1953, since then restrictions have been based on financial or health reasons. Demographic features have changed which had an influence on eating habits. Today households are much smaller than 40 years ago; the typical "2.4 children" family represents actually only about 10% of the total population. Small households can adapt more easily to an individual's needs or preferences, hence choice is more important than ever for food selection.

Although diet and health concerns have become more widespread in the last 40 years this hasn't necessarily influenced peoples eating habits or attitudes towards eating, as is shown by surveys of the Daily Telegraph. In the years 1947, 1962, 1967 and 1973 Gallup Poll conducted a study on behalf of the Daily Telegraph asking a representative sample "If expenses were no object and you could have absolutely anything you wanted, what would you choose for a perfect meal?" Surprisingly, the menus remained virtually the same, namely Sherry, Tomato soup, Roast chicken (1947) or steak (1973) with potatoes and vegetables, trifle or apple pie, cheese and biscuits, and Brandy (only chosen in 1973) (see Burnett 1989).

However, a survey about what constitutes the perfect meal is only one way of assessing change. Since the 1950's a revolution in farming methods has taken place, which has been widely described as 'factory farming' (Spencer 2000). Research into cellular growth and DNA allowed the creation of plants and livestock with desired characteristics. The development of new drugs and chemicals as well as new building technology has permitted farmers to keep a greater number of animals. Although food was produced cheaper and in a greater variety than ever before some consumers were beginning to feel that the costs to environment, animal welfare and human health were unacceptable. As a result, the vegetarian movement grew significantly. Rationing records in 1945 showed that there were only 100,000 vegetarians in Britain. In 1990 the estimated number was 3 million (Spencer 2000). Vegetarianism and environmentalism were often yoked together as an expression of an alternative culture. What you consumed did not only reflect your personal taste or budget but also your political opinions. Some commentators referred to the 1970's as the 'brown

decade' because of the popularity of the concept of healthy eating symbolised by whole meal pasta and bread, real ale, and brown rice (Hardyment 1995). Since then the safety aspect of food has been regularly grabbing headlines, reaching from campaigns over pesticide residues, salmonella and 'mad cow disease', to most recently the controversy about genetically modified food. Consumer patterns have changed in response to these highly publicised scandals, but also to general warnings about the health implications of a diet high in saturated fat and sugar and low in fibre. After all, the modern diet throughout the Western world has been implicated in a wide range of so-called diseases of affluence, including heart disease, tooth decay, irritable bowel and food-related cancers.

The current trend, particularly in higher social classes, to use semi-skimmed milk, poultry instead of red meat and brown bread instead of white, can certainly be attributed to health as well as to cosmetic reasons. Yet these changes are not sufficient for the National Advisory Council on Nutrition Education, which presented in 1983 a report demanding more changes. It recommended a reduction in the consumption of fats by 30%, saturated fat 50%, sugar 50%, salt 50%, and alcohol by 50%. They recommended an increase in the consumption of fibre of 50% by eating more cereals, fruit and vegetables.

Another key trend is the shift of eating patterns, especially the increase of snacks and frequency of eating. American studies have shown that people do not eat three times a day but have, on average, 20 contacts with food per day, and in Europe a similar trend can also be observed (Habermas 1990). In regards to the quality of food Burnett argued that urbanisation and rising real incomes have encouraged the use of so-called stress foods with a high sugar content and snack foods eaten between meals and often consumed outside the home (Burnett 1989). The same author reports that the snack food industry has seen spectacular increases with potato crisps sales alone being valued at £585 millions (the role advertising plays in the increase of snack foods will be examined in chapter 3) (Burnett 1989). From a sociological perspective, a meal is defined as a structured, social event involving food (Mennell, et al. 1992). A meal is governed by rules concerning the sequence of courses, time,

place and a series of actions. In contrast a snack is defined as an unstructured event involving one or more self-contained food items. In Hardyment's opinion, the most marked shift since the war in British domestic eating has been the absolute decline in the number of 'proper meals' consumed at home (Hardyment 1995). In particular the English breakfast (formerly almost stereotypical for British cuisine) has declined. Hardyment based her argument on a survey by Kellogg's in 1988 which showed that 25% of the British population had only bread or a roll for breakfast, what was more 17% of adults and 9% of children ate nothing at all. The author concluded that the decline of breakfast led to an increased need for snacking during the day and thereby encouraged any existing tendency for obesity. Although there can be no doubt that snacking is on the increase it is less certain that snacking has overtaken meals as the dominant mechanism for food consumption. Charles & Kerr emphatically argued that across all social classes 3 meals a day, including at least one cooked meal is still the rule and central to the family food system (Charles & Kerr 1988).

As the historical review has demonstrated, meals have never been purely about fulfilling nutritional needs. Meals reflect status differences, have symbolic meanings, and play an important part in the socialisation, as mealtimes are occasions when social groups come together. They offer the opportunity to observe and learn what is acceptable behaviour and what roles different members of the group occupy. Given the importance of meals as a social event it is not surprising that it also has not only historical but also sociological relevance.

Women play a key role within the domestic dietary culture, as they are the main food preparers. One study of 37 pregnant women in South Wales found that they valued the cooked dinner as essential for their families' dietary needs (Murcott 1982). An important feature of these dinners was the extent to which they validated their roles in the family and the marital context. The author concluded that 'if a job defines how a man occupies his time during the working day, to which the wage package provides regular testimony, proper provision of a cooked dinner testifies that the woman has spent her time in a correspondingly suitable fashion ... the cooked dinner in the end

symbolizes the home itself, a man's relationship to that home and a woman's place in it.' (Murcott 1982, p.693). Hardyment pointed out that the relationship between women and food is problematic, as they have to combine conflicting tasks (Hardyment 1995). They have to accommodate family tastes and ensure variety, but they also have to square them with perceived nutritional requirements. Furthermore, although the position to choose what food is purchased for the family is principally a powerful one, studies have show that women tended to subordinate their own food preferences to those of their male partners. Charles & Kerr studied the role of women in the kitchen and the family in 200 young mothers in urban areas of northern England (Charles & Kerr 1988). They showed that there is a wide consensus as to what a proper meal is ('meat and two veg'), and that men were believed to need more meat. The authors concluded that families were characterised by sexual divisions and power relations that determine food selection and the assumptions of women concerning the food needs of all the family members. The saying "Tell me what you eat and I will tell you who you are" is not only true for social status but also sex. In the north of England, beer consumption showed a marked distinction between women and men. 'Real' men drink ale, women (and "ill tutored youngsters") drink lager. Women eat smaller portions and are expected to do so; just as for medieval women it was taboo to show too great an appetite.

As described in the previous paragraphs, food selection and eating have been invariably linked with class and social status, and the consumption of fruit and green vegetables is a clear example of a present day class-gradient. Class influences not only food selection but also table manners. An interview study of Dutch mothers of primary schoolchildren found that mothers of higher social classes imposed stricter rules on their children, their partners, and in particular themselves, than mothers from lower socio-economic classes (Van Otterloo & Van Ottrup 1989).

Investigations into the sociology of food have concluded that sex, class, and age were important determinants for the distribution of food (Mennell, et al. 1992). Throughout history children have been fed differently to adults. In previous

centuries they received less food because there was no understanding that growth requires extra calories. Today parents and governments prioritise good nutrition for children because it is seen as a guarantee for healthy adulthood. The following section will describe the changes in attitudes towards children in more detail.

2.2. Historical changes in the concept of childhood

The way a society treats and rears children is dependent on the concept of childhood that is present at the time. In other words, each society has different expectations of what can and what can't be expected from members of different age groups, how they should behave and how they should look.

One of the first books concerning the general history of childhood was Philippe Ariès' work 'Centuries of Childhood' (Ariès 1962) and his ideas were very influential. Ariès' main hypothesis was that childhood is a comparatively new concept and that only with the beginning of the 17th century was childhood seen as a distinct stage of human development. He claimed that in "medieval society the idea of childhood did not exist: this is not to suggest that children were neglected, forsaken or despised. The idea of childhood is not to be confused with affection for children; it corresponds to an awareness of the particular nature of childhood, that particular nature which distinguishes the child from the adult, even the young adult. In medieval society this awareness was lacking" (Ariès 1962, p.125). Infants up to seven years of age were seen as vulnerable and fragile, and their death was treated with a certain degree of casualness. This view has been more recently criticised with the main criticism being that the lack of our concept of childhood doesn't necessarily imply that medieval society did not have any concept of it (Archard 1993).

A second hypothesis of Ariès was that before the concept of childhood existed children were free to mix with many classes and ages and that the modern family restricts the freedom of children. De Mause interpreted history very differently when he argued, "the history of childhood is a nightmare from which we have only recently begun to awaken. The further back one goes, the lower the level of childcare, and the more likely children are to be killed, abandoned, beaten, terrorised,

and sexually abused" (DeMause 1976, p.1). Lyman tried to trace the history of childhood to late Roman and early medieval times (Lyman 1976). With a few exceptions the knowledge of parent-child relationships is based on aristocratic and wealthy families and the majority of the experience of 'commoners' escapes us. Childhood in these epochs was not noteworthy in its own right, however from laws and descriptions we can make some conclusions about the situation for children. Two laws from the Theodosian code (circa 322AD) allow a conclusion about the frequency of infanticide: "We have learned that the provincials suffering from scarcity of food and lack of sustenance are selling or pledging their children. It is repugnant to our custom to allow any person to be destroyed by hunger or rush forth to the commission of a shameful deed". And "A law shall be written on bronze or waxed tablets or on linen cloth, and posted throughout all the municipalities in Italy, to restrain the hands of parents from infanticide and turn their hopes to the better (...) if any parent should report that he had offspring which on account of poverty he is unable to rear, there shall be no delay in issuing food and clothing, since the rearing of a new-born infant can not tolerate delay..." (Lyman 1976, p 84).

The coming of Christianity did not end the 'dark ages' for children, but it meant the beginning of a slightly less appalling outlook, however it took until 374AD for infanticide to become a capital offence. Parents were now seen as responsible for the moral upbringing of their children and church leaders built on classical ideas that children could be taught, had souls and were therefore important to God. Thus they should not be killed, maimed or abandoned and furthermore children were regarded as being useful for the self-image of parents. Although neglect and exploitation of children became more widely opposed over the next centuries this did not mean that children's conditions improved immediately. The idea of the child as possession and property of their parents continued to dominate parental actions and attitudes. That children in the medieval epoch were not considered very important is reflected in the following popular proverbs from the 15th and 16th century. "Who sees a child sees nothing" and "For children and women naturally are hard to keep counsel of that thing a man would have kept secret" (Tucker 1976). Children were at the bottom of the social scale and if the child was noble its gender was the central concern as the

example of Henry VIII's desperation for a male heir clearly demonstrated. The medieval interest in the ancients encouraged classical scholarship and education. It became essential for upward social mobility, to secure important government posts, and to turn children into gentlemen and gentlewomen. Again proverbs illustrate the attitude to teaching "As a sharp spur makes a horse run, so a rod makes a child learn" and "The child whom the father loves most dear he does most punish tenderly in fear" (Tucker 1976).

Calvert described this view of children from the middle age to the middle of the 18th century as 'the child as an inchoate adult' (Calvert 1992). The ideal of society was adulthood; children were regarded as adults in the making, with distinct shortcomings. Man can talk, stand upright, walk, and reason - all things young children are incapable of doing, which by popular belief put them closer to the animal than to the human. To disguise these shortcomings babies were swaddled and infants put in corsets that gave them a more upright and therefore a more mature and attractive appearance. Childhood was a risky and undesirable stage and parents did their best to hurry the infants through this stage into adulthood (Calvert 1992).

John Locke was ahead of his time when he published 'Some Thoughts Concerning Education' in 1693, suggesting that children should be reasoned with and not simply beaten into conformity (Archard 1993). He saw children as white paper waiting to be filled with ideas and reason. To achieve reason children should be exposed to situations that discourage the exercise of bad character traits and to keep them away from situations that encourage them. His position was very close to the image of the 'natural child' that became most popular between 1750 and 1830. Another important influence of this period was the philosopher Jean-Jacques Rousseau who cautioned in 1762 "We know nothing of childhood. The wisest writers devote themselves to what a man ought to know, without asking what a child is capable of learning. They are always looking for the man in the child, without considering what he is before he becomes man." (quoted in Calvert 1992, p. 10). Rousseau's achievement was that a large group of people came to believe childhood was worth the attention of

intelligent adults. He encouraged them to take an interest in the process of growing up, not only in the results of this process. This wasn't a purely academic interest but influenced the daily life of parents and their offspring. Mothers were motivated to enjoy running a nursery and fathers were encouraged to play and romp with their children to keep a close eye on their development. Rousseau was best known for his plea to mothers that they should nurse their own children. This was almost revolutionary at a time when in Paris over 80% of the babies were given to professional wet nurses in the country.

Following Rousseau's arguments, parents started to realise that they were guardians and not owners of their offspring, and that children needed more freedom and fewer restrictions and protection. In contrast to previous centuries, children weren't seen as more fragile than adults but fitter and more resistant because they weren't yet spoilt by comfort and luxury. Children were now exposed to daily outings in cold air; they were only lightly clad or covered, and bathed in cold water to make them more resistant to disease and deformity. Middle-class families came to accept that childhood was a legitimate stage and the assimilation into an adult world was delayed until children had a chance to finish their education, however infants were widely regarded as rather selfish, uninteresting and unattractive creatures.

This changed in the Victorian era (1830 to 1900) into the view of the 'innocent child'. Innocence became a religious and literary ideal (see Oliver Twist, Little Eva) with children being regarded as charming and pure, and therefore nearest to God. Their complexity inspired great interest which found its manifestation also in the origin of child psychology, commonly seen in the publications of Wilhelm Preyer's 'Die Seele des Kindes' (Preyer 1882) and G.S. Hall's 'Contents of Children's Minds' (Hall 1883). Minute studies of children became very popular and many mothers had a journal where every event, word, action, and step of the infant was recorded. Although not intended to be used as measures, parents had rising expectations of their children, and were worried if their children hadn't reached certain developmental stages at the right time. Middle-class parents became more concerned about the babies' comforts

and happiness because they believed that even small infants could suffer pain, distress, and fear. Consequently they were less inclined to harden their children to the same degree as before. The home was meant to be a nest and idolised as Mrs Beeton writes: "It ought to enter into the domestic policy of every parent to make her child feel that home is the happiest place in the world; that to imbue them with this precious home-feeling is one of the choicest gifts a parent can bestow " (Beeton 1861, p. 98). Still, society in the 19th century placed values like self-restraint, a proper appearance and control above spontaneity. "There is no more important duty developing upon a mother, than the cultivation of habits of modesty and propriety in young children. All indecorous words or deportment should be carefully restrained and delicacy and reserve studiously cherished" (Beecher, 1848, p.238: quoted in Calvert 1992, p. 121) warned the author of a domestic manual.

Victorian middle class parents were more concerned about the comfort and welfare of their children than ever before, but this concern very often didn't stretch to the welfare of other - in particular working class - children, who were exploited and often maimed in the newly developing industries. In 1802 the Factory Act in England was the first legislation created to ensure the well being of children, although it applied only to orphan apprentices who were wards of the state. Public bodies enlarged their concern to protect children also against their own parents, and apparently this was necessary to stop the worst practices of child insurance, where children were killed or injured to obtain the money, and child farming. In 1889 the British Parliament passed a law to protect children against cruelty (but only after the Society of Prevention of Cruelty against Animals received complaints and decided that it could hardly draw the line at protecting animals) (Robertson 1976). One more sinister view of this development was that an increased responsibility of the state meant also increased influence and control (Hardyment 1983). Children were no longer seen as the property of their parents but also of the nation itself, the state started to invest in children in the areas of health care and education, a development that has continued to the present day.

The first half of this century was the era of baby care experts. Numerous baby books and pamphlets were written, health visitors who checked the standard of infant care became common practice, and clinics and welfare centres sprang up all over Britain. Families became smaller and parents could concentrate their attention (and money) on fewer children. Hervey Elwe summarised these changes in his anthology 'The Modern Child' (1908) (see Hardyment 1983, p 123): "In nothing is change in the last fifty years more marked than in the mental attitude of the English-speaking races towards their children [...] Nowadays nothing is too good for children, no sacrifice too great; money and time are poured like water before their tripping feet. Literature is flooded by a multitude of books about children, full of intuition, insight, and tenderest understanding." Whereas childcare had been a comparatively private matter it started to become a national issue. The role of the mother was of high importance to rebuild a strong and healthy nation fit to "rule the waves" and her behaviour particularly in the first two years would shape the entire future of the child. Expert guidance was seen as essential to fulfil this role.

The key figures of this new scientific approach in the 1920's were John B. Watson and Frederick Truby King. Both men came to the study of children from the study of animals and drew parallels between the training of pets and that of infants. The foundation of their theories lay in behaviourism and they developed physical and psychological programs that largely ignored individual differences. Feeding and sleeping by the clock were advised to establish regular habits from birth onwards. Babies should be left outside in the fresh air (8am to 5pm in winter and 7am to 10pm in summer) and generally toughened up to achieve independence from the mother and to become a 'bonny' and well-trained baby. Watson's description of a happy child was as follows: "A child who never cries unless actually stuck with a pin, illustratively speaking; who loses himself in work and play; who quickly learns to overcome the small difficulties in his environment and without running to mother, father, nurse, or some other adult; who builds up a wealth of habits that tides him over dark and rainy days; who puts on such habits of politeness and neatness and cleanness that adults are willing to be around him; at least part of the day; a child who is willing to be around adults without fighting incessantly for notice; who eats

what is set in front of him and 'asks no questions for conscience's sake'; who sleeps and rests when put to bed for sleep and rest; who puts away two-year-old habits when the third year has to be faced; who passes into adolescence so well-equipped that adolescence is just a stretch of fertile years, and who finally enters manhood so bulwarked with stable work and emotional habits that no adversity can quite overwhelm him." (Watson 1928 cited in Hardyment 1983, p. 172).

But it was Truby King who became standard advice to new mothers in the clinics between the 1920s and the late 1940s. He started his medical career studying the high death-rates of bucket-fed calves and drew parallels to the high mortality rate among bottle-fed infants. As a consequence he promoted breast-feeding with the slogan: 'Breastfed is best fed!' and introduced a very rigid feeding regime. A true Truby King baby was breast-fed every four hours during the day (but never during the night) from the day of birth until the age of 9 months. It was 'bonny' but not fat, which was a change in attitudes, as previously fat was synonymous with healthy, and to have a 'Truby King baby' became the ambition of British women. Particularly middle-class women embraced Truby King's approach that incorporated a separation of children from the adult world in specially equipped nurseries and playpens that demanded spacious flats and gardens. Truby King's first Mothercraft School opened in 1917 and was a reflection of a changing society. In 1900 there were more than 2 million servants in private households including a ¼ million nannies whereas in 1930 less than ½ million servants were employed. A majority of middle-class households aimed to live in newly founded suburban, private homes. Newly developing women's magazines promoted 'modern housewifery' with women being 'the craftworker' (nurse, needlewoman, teacher, nutritionist, chef, beautician, amateur psychologist and design expert) of her time (Humphries & Gordon 1993). Despite the dominance of behaviourism psychoanalytic views of children gained some influence and caused worries about the possibility that infants are 'id-driven' beings. The status of the child took a backward step with the beginning of the 1920's "having struggled from child of nature to innocent babe, trailing clouds of glory and finally to prodigious, much-studied genius in the 'century of the child' epoch, the baby slid now back to unpredictable, coarsely motivated savage" (Hardyment 1983, p.201).

The Second World War changed attitudes to the rearing of children and to children themselves. The ideal of the Hitler youth was to be hard like steel, tough like leather and fast like greyhounds. Organised and very structured child-rearing practices in the Third Reich and in Russia were perceived as a danger to the world, instead of being models for a new society. In reaction to this, parents 'of the free world' were determined to allow their children more freedom than ever before. A never previously known prosperity among all classes combined with shorter working hours and time saving household equipment permitted them to spend money in unprecedented quantities.

Nobody symbolised this new approach better than Benjamin Spock. His book 'Common Sense Book of Baby and Child Care' was first published in 1946 and was outsold only by the Bible. Instead of following scientific procedures mothers were encouraged to react instinctively to their children, to cuddle them, and to have fun with them. The new model child was affectionate, impulsive, dependent and preferably intelligent. Playtime gained dual importance to aid emotional and intellectual development and childhood became a separate period of life with its own activities, folklore and literature. Looking at the child in literature the incredible changes the concept of childhood have undergone become very apparent; there are worlds between the Victorian Oliver Twist and today's Harry Potter but both are expressions of their time.

2.3. History of infant and child feeding

Feeding is an important means of infant and child socialisation and thereby vital for an individuals personality formation. In many cultures the family might be most effectively conceptualised as those people we share our meals with (Counihan 2000). This connection can also be traced back in our language where the old English word 'foster' means 'food'.

The prehistoric patterns of human infant feeding are usually reconstructed on the base of observational studies on primates living in the wild. Like virtually all primates, humans have a relatively small number of infants, usually born as singletons, in which the parents invest considerable attention and effort. To protect the child and thereby ensure the best chance of survival, close physical contact with the parent is essential. This contact is reinforced by primate milk that is high in sugar and low in satiety producing fat, in other words a milk composition encouraging frequent snacking instead of large isolated meals (Quandt 2000). Observational studies in hunter and gatherer cultures demonstrated that infants were normally kept in skin contact with the mother and that nursing took place frequently upon demand.

The earliest sources regarding infant feeding in Europe can be found in medieval times. One of the most widely distributed medical works of the 13th and 14th century was the 'De proprietatibus rerum' by Bartholomeaus Anglicus (around 1230), which contained a section about nursing, the breast, and the quality of milk. He declared that the natural mother is the best nurse, because she loves the child most. If a nurse is necessary she must take the mother's place and love and cherish the child as if it was her own. There is no mentioning of restricting infants to any kind of feeding schedule, infants were probably fed on demand or, in poorer families, when the mother was not working. Contemporary European physicians agreed that boys should be weaned from the breast at about 2 years of age whereas girls could be weaned earlier because they needed less strength and lived longer (Fildes 1986).

Poorer woman nursed their own children, while most of the wealthy families employed wet nurses. Preachers and physicians always warned against wet-nursing because they feared that the baby would acquire the moral and spiritual characteristics of the nurse not the mother. For example, an ill-tempered woman would transmit her vice in her milk, if she was red-headed, a treacherous mind and temper might be conveyed (Cone 1981). The resistance against the use of cow-milk had similar reasons, and the early Roman writer Phayorimus cautioned that "if the lamb be nourished with the milk of goats, they shall have course wool like the hair of

goats: and if kiddes in lyke maner suck upon shepe, the heare of them shall be soft lyke wolle" (Cone 1981). Although the use of animal milk was denounced it must have been used on occasions as wooden and earthen feeding vessels, mainly from the 15th century, have been found (Fildes 1986).

The medical teaching of medieval times was based on Aristotle's and Hippocrates' system of the fundamental principles of the natural world. According to their theory, this natural world consists of four elements: air, fire, water, and earth, and like everything food is composed of these elements. The nutritional value and digestibility of each food are determined by the relative qualities. Children were supposed to have a phlegmatic temperament that is represented by the qualities moist and cold. Bread crusts and milk were given to children who were weaned, because the coldness and moisture of the milk needed to be blended with the qualities of bread that created choler and melancholy. Drummond & Willbraham cite Ibid's advice that "Chyldrene wold be nourysheth with meats and drynkes, whiche are moderately hote and moyste, not with stanynge Galene dothe prohibite them the vse of wyne, bycause it moysteth and heateth to moche the bodye" (Drummond & Willbraham 1958). When children were slightly older they graduated to the free choice of adults, but weren't any longer exempt from fasting regulations.

Wet nursing had been a common practice since the beginning of the second millennium, but in England it reached its height between the 17th and early 18th century. Infants who were fed in this way came either from comparatively wealthy families or were so-called parish children (orphans, bastards, foundlings, etc.). Children from wealthy families were sent to a wet nurse in the country because it was believed that good country air and a healthy wet nurse were the best guarantee for the survival of a fragile baby. Because the infants stayed up to 40 miles away from their parents they were often not seen by them for the first year(s) of their lives. That women from higher social classes seldom nursed their children themselves had often other reasons than the mere concern for the health of the baby. Wet nursing increased the chances of pregnancy and at that time many women were pregnant up

to 20 times to ensure the survival of one or two children. It also freed the lady of the house to continue her normal duties and it was more expensive to employ somebody to replace her than to employ a wet nurse (Fildes 1986). Although maternal breast-feeding was advised for centuries, this campaign was not effective until the mid-eighteenth century. As outlined before, it was then that the idea of the natural child caught on, natural, simple methods of infant feeding became popular and women became idolised as mothers.

It was in the early 18th century that it was finally considered safe to give children water-pap (a mixture of bread, baked flour and water) as soon as the first tooth appeared, although the breast wasn't withdrawn until the age of two. Because of the success of this mixture, other food was used like weak broth after the first tooth, the minced wing of a chicken after the second, for the first time sugar was added to baby food to make it more appetising. Cone refers to Michael Underwood as the most sophisticated writer on childhood diseases in the late 18th century who saw cow-milk as the best alternative to breast milk Cone 1981. He condemned the mixtures which have been previously used, by saying that it "has indeed been a wonder to me how the custom of stuffing new-borns with such like could become so universal, or the idea first enter the mind of a parent that such heavy food could be fit for babies' nourishment at the age of six or seven months. This food may be justly considered a poison...." (Cone 1981, p34).

The reluctance against solely artificial feeding becomes understandable if one considers the mortality rate (between 85 and 99%) in foundlings' homes and hospitals in the late 18th century where artificial feeding was used. Mrs Beeton commented on the subject of baby feeding that mothers should try to breastfeed their children between 9 and 12 months, but admitted that not all women are cut out to breast-feed. She believed that mixed feeding would save the strength of the mother; the child will sleep longer and gain more strength and resistance against sickness or disease. With the industrial revolution artificial foods became more scientific (milk analyses were undertaken, calorimetric requirements in relation to body weight were

calculated) and more convenient. In the middle of the 19th century a pulverised mixture of flour, cow's milk, malt-flour and potassium bicarbonate was introduced and marketed as 'perfect' infant food, and condensed milk - especially Nestle's - became popular baby food because it wasn't as contaminated as fresh milk and lasted longer before going off. An additional problem of bottle-feeding was that few mothers understood the importance of the sterilisation of bottle and rubber with the consequence that they were germ ridden. It has been estimated that around 1900 bottle-fed babies were fifteen times more likely to die within the first year of their lives than those being breast-fed (Humphries & Gordon 1993).

With an increased involvement of the state in health care and welfare, the state took more interest in the nutrition of children. Complaints by teachers that pupils who were hungry were uneducable triggered the Education Act in 1906, which concerned the provision of meals at schools, and the Medical Inspection Act in 1907. By 1914 over 200,000 children were benefiting from these free meals (usually soup, a meat-dish with vegetables and a pudding), which were designed to counter-balance the effects of malnutrition due to poverty or rationing in wartime. It proved a successful scheme with weight charts showing increases in the weight and height of pupils as well as academic improvements (Burnett 1989; Kitchin & Passmore 1949).

As described earlier, the key-figure for the rearing of children in the 1920's was Truby King, who promoted a very rigid feeding pattern. As on the whole subject of child-rearing, Spock's opinion is very different and he advised demand feeding without any schedule and not purely limited to daytime. Spock agreed that breast-feeding was preferable but acknowledged the difficulties of the mother to do so, for example it was difficult to feed on demand in public. Flexibility in when, how, and what to feed characterised this new approach. Whereas in the 1920's solid food was generally introduced after the age of 6 months, by the mid 1950's infants were offered solid foods on the second or third day of their lives (Bond, et al. 1981). Table manners lost most of their importance and were replaced by a growing concern about feeding problems. Instead of brisk behaviourism, gentle persuasion was advised to

deal with infants. The art of persuasion reached its peak with Spock's classic description of the child who would only swallow mouthfuls of food, alternately offered by mother and grandfather while the father drove his car slowly backwards and forwards outside the kitchen window.

More and more parents used artificial baby food that became very easy to prepare, and it was also possible for fathers to feed their infants. The concept of bottle-feeding as convenient, modern and liberating led to a decline of breast-feeding in industrialised western societies. Additionally psychoanalytic views gained more influence and with it three aspects of feeding assumed new significance: biting the nipple, when is the right time to wean, how to avoid the trauma of weaning. As a consequence mothers were advised to stop breast-feeding after six months when teething occurs and many parents agreed that breast-feeding wasn't worth the trauma it caused when the baby had to be weaned. Another reason for the decline in breastfeeding was the fact that giving birth became a more and more medical event and it was not uncommon for mothers and newborns to spend the first two weeks in hospital. During this time the infants were normally separated from their mothers and only brought to them to be nursed at rigid intervals. Mothers were encouraged to wear facemasks while breast-feeding and were not allowed to hold their babies afterwards (Quandt 2000). Given these circumstances it is not surprising that the milk supply of the mothers were insufficient or that the mothers felt more comfortable using formula milk. In 1947 about 40% of 3 month old babies in Britain were fully breast-fed, in 1968 it was only 10% (Chetley 1986). Baby formula manufacturers certainly promoted this change with slogans like: "Give your baby the benefit of modern research-Vitamilk" (Glaxo), "You can't do better for your baby" (Cow & Gate), and "Now Dad can give the baby all the goodness of mother's milk" (Nestle) (see Chetley 1986).

In the 1970's people started to realise that Dad maybe could not give all the goodness of mother's milk and research emphasised the chemical as well as the emotional benefits of breast-feeding. Middle-class women, who were the first to start the trend

of bottle-feeding, were now the first to reverse it and followed the new ideal of native women. It seems ironic that particularly in Third World countries, on which the ideal of a natural mother-child relationship is based, the use of artificial feeding has dramatically increased with detrimental consequences for the health of infants. The World Health Organisation issued an International Code for marketing breast milk substitutes which clearly states that "Breast-feeding is an unequalled way of providing the ideal food for the healthy growth and development of infants; it forms a unique biological and emotional basis for the health of both mother and child; the anti-infective properties of breast milk help to protect infants against disease; and there is an important relationship between breast-feeding and child spacing." (cited in Dobbing 1987, p.10)

Studies carried out by the Office of Population Census and Surveys (OPCS) in England and Wales found an increase of initial breast-feeding from 51% in 1975 to 67% in 1980 but no more increase after that. Data from Scotland were included from 1980 onwards and interestingly they clearly lie below the national average. In 1985 only 48% of Scottish women started breast-feeding after birth and 19% continued to do so after 6 months in comparison to 65% and 22% in England and Wales. Although breast-feeding is strongly promoted and mothers do believe in the benefits of doing so, the majority obviously do not persist for the recommended length of time. This might have different reasons like the belief of insufficient milk supply, difficulties with feeding, lack of information about feeding skills etc. (Wright 1993) but also reflects anxieties mothers have about feeding their infants. Feeding seems to have become one of the main concerns of parents and almost a third of mothers report feeding difficulties to their GPs and Health visitors. This growing concern is not surprising given that it is now a commonly held belief that good nutrition in infancy and childhood contributes to a healthy adulthood and that eating habits acquired in childhood shape those of later life.

The concept most mothers are trying to achieve in the nutrition of their children is a 'balanced' diet that is characterised by dairy products and green vegetables (Mennell,

et al. 1992). The authors interpreted this as a cultural construct that is used to reduce anxiety when facing the overwhelming variety of food, which is presently available. Again social class plays an important role as demonstrated in the interview study, cited above, with Dutch mothers of primary school children that ideas about 'good food' varied slightly with social class and that mothers of higher social classes impose stricter rules on the eating behaviour of their children, partners and themselves (Van Otterloo & Van Ottrup 1989).

2.4. The History of Eating Disorders

One of the important features of anorexia nervosa and bulimia nervosa is a morbid fear of being or becoming overweight. In modern Western societies a slim body is seen as an essential criterion for female beauty and women and girls are prepared to endure a great deal to achieve this ideal. A review of surveys of eating behaviour in adolescent populations found that between 48-80% of females wanted to weigh less and between 37-70% were on some sort of diet at time of survey (Whitaker, et al. 1989). Another group concluded "It is possible that something as hard for most women to achieve as the thin ideal comes to be more valued precisely because it is so difficult to attain. In a time of affluence, thinness becomes a status symbol for women" (Rodin, et al. 1984, p.289-290).

2.4.1. History of obesity

It is often argued that today's obsession with weight contributes to the development of eating disorders. The next sub-section will examine whether this obsession with weight is indeed a comparatively new development and how past and present societies have dealt with obesity.

Bruch refers to the 'Venus of Wilendorf' as the earliest known representation of the human figure, a statue that dates back to 20,000 - 30,000 BC (Bruch 1974). The sculpture represents an obese woman with large breasts, hips and abdomen. Other prehistoric Greek, Babylonian, and Egyptian statues show similar female shapes. She admitted that it is unknown whether these archaeological findings stand for a realistic representation of women, artistic ideals or if they were fertility symbols.

Nevertheless, it seems convincing that in times when survival was threatened by the unpredictability and scarcity of food supply that fat reservoirs would be appreciated. Anthropologists reported that in many so-called primitive cultures (where food supply isn't always secure) obesity is regarded as beautiful. In some parts of Africa young girls are still sent into fattening huts to gain some weight before they get married to be more beautiful and physically able to bear children.

A concern about obesity is not new and in ancient Greek and Roman societies the privileged classes were confronted with the dilemma of how to stay slim in the face of abundant food. In Greek as well as in Roman medical literature, advice on how to fight obesity can be found, and it is similar to today's advice: namely the decrease of food intake and the increase of physical exercise. The Spartans were particularly strict and punitive in their attitudes towards corpulence. Once a month young Spartans had to undress and they were checked to see if they had gained any excess weight. If this was the case they were forced to exercise even more rigorously. The ancient ideal of beauty for men and women was a well-proportioned body, tall and slim. Homer's Odysseus admired the figure of a woman because it reminded him of a palm tree (Hurschmann 1995). The Romans shared the dislike of obesity and solved the dilemma of how to eat and remain slim with the introduction of vomitoria, where they induced vomiting after a rich meal (Bruch 1974).

During the middle ages various views were held on obesity. On the one hand, a certain amount of fatness was seen as a sign of the grace of God and thereby as a status symbol. On the other hand, gluttony was regarded as one of the seven deadly sins and obesity was an expression of eating more than necessary. As described earlier, women were discouraged from showing too much interest in food and eating when they were dinning in company. The ascetic and religiously inspired ideal of beauty for wealthy medieval women was to be pale, fragile and thin. Despite this ideal it would take until the mid-nineteenth century until obesity became a much discussed medical problem (Bruch 1974; Brumberg 1988; Habermas 1990).

Looking at past societies it is clear that obesity only became a problem when an abundance of food was present. This was previously mainly an issue for a very small privileged class, but with the industrial revolution food became more widely available to everyone. More people than ever before had the opportunity to become gourmets and gourmands and consequently obesity became more widespread. A certain degree of plumpness was still regarded as desirable and only excessive obesity was regarded a pathological. One definition of the contemporary view of "excessive" was weighing 100kg or more (Habermas 1990). Previous writers in this area refer to Ebstein, who published an influential book (Ebstein 1882) on corpulence and its treatment in 1884 (Bruch 1974; Habermas 1990). According to Ebstein there were three stages of obesity: in the first stage the individual concerned is an envied person and his embonpoint is admired. In the second stage, the obese person becomes a comical figure and in the third stage a pitied severely ill person. To avoid the last two stages it became popular and fashionable to undergo newly developed weight loss programs. In the Victorian era many women subscribed to the idea that satiety is a conviction of sin, larger women were generally not blamed as lacking self-control (Brumberg 1988). It is also important to remember that at this time women were bound in tight, rigid corsets, which shaped their bodies into an hour-glass shape. A small waistline was of extreme importance but this does not necessarily mean that the whole body had to be slim as the following criticism underlined. "One must mention here that aesthetic errors of a worldly nature to which all women submit, may make them want to stay obese for reasons of fashionable appearance... It is beyond doubt that in order to have an impressive décolleté each woman feels herself to be duty bound to be fat around the neck, over the clavicle and in her breasts. Now it happens that fat accumulates with greatest difficulty in these places and one can be sure, even without examining such a woman, that the abdomen and the hips, and the lower members are hopelessly fat." (Heckel 1911, quoted in Bruch 1974, p.18)

This must be one of the last European comments to criticise fashion for inclining women to stay obese, because a radical change in the image of female beauty occurred in the 1920's. The flapper-girl became the image of a new epoch promoting

the new silhouette that was slim and straight. Consequently, hourglass shaped corsets were replaced by a single band of material that covered the body from chest to waist and flattened the bust. The French physician Roustaine wrote in 1914: "Nowadays it is not the fashion to be corpulent: the proper thing is to have a slight, graceful figure far removed from the embonpoint, and a fortiori from obesity. For once, the physician is called upon to interest himself in the question of aesthetics." (Roustaine 1914, quoted in Brumberg 1988, p. 239).

Before the 1920's, clothes were usually made to measure, in order to market ready-to-wear clothing a normative size range was introduced which increased emphasis on how the individual body related to norms. With the beginning of the 20th century another weight norm gained increasing importance. Insurance companies collated retrospective information about the weight and height of their policyholders, and drew the conclusion that fat policyholders died younger than slim ones. The Standard Tables of Height and Weight were based on this information and give average/recommended weight-height ratios for men and women. They also advised that a weight of 20% or more above the normal weight range justified medical intervention and fitted the view that obesity is a disease. These charts - and revised forms of them - are still in use although there has been wide criticism because they do not consider such factors as age, bone structure, and general body-build.

By the early 20th century paediatricians were no longer only concerned with the weight and feeding of newborn babies but also with older children. As described earlier, infant mortality rates were still very high and many deaths were attributed to gastric or digestive disorders. At that time a fat baby was considered healthy and bonny, an attitude that was criticised by 1920's advisors on childcare like Truby King who advocated rigid feeding regimes and a baby that was not fat. Others advised feeding foods that were light and not too rich in fat (Gibbens 1954). They described the surprise of parents of fat children who fall ill "...If you ask for the past histories of some of the thin and underweight, a mother will say: "But I can't understand it. Before she fell ill she was so lovely and fat." To put it briefly, the heavy eaters have

come to grieve" (Gibbens 1954, p. 20). Still, before the 1940's the underweight child was the central problem in medical and clinical literature. In the 1940's papers with titles like " What to Do about a Fat Child at Puberty", "Reducing the Adolescent" and "Should Teens Diet?" captured the rising interest in adolescent weight control (Brumberg 1988).

Since the 1960's the trend to diet has reached new dimensions firstly because the beauty ideal gets slimmer and slimmer whereas the average weight of the population increases; and secondly a new emphasis on fitness has been added. There can be no doubt that in our society obesity is associated with a stigma, and that this is particularly true for women. One expression of this is the strong negative correlation between socio-economic status (SES) and obesity; a finding which is consistent in all epidemiological studies undertaken in developed countries.

Negative perceptions of obesity can already be found by primary school age. Staffieri demonstrated this by showing 6 to 9 year old boys silhouettes of different body types (fat, muscular, thin) and asking them to assign adjectives (Staffieri 1967). He found that all adjectives assigned to the muscular type were basically positive whereas adjectives assigned to the fat silhouette were socially unfavourable and primarily aggressive like: cheats, fights, argues, and stupid. Adjectives assigned to the thin silhouette were also negative but expressed more personally unfavourable and submissive stereotypes like: sad, quiet, and worries. Interestingly these assignments were made independent of their own body shape, and Staffieri also found that boys with a muscular body shape were indeed more popular than others. Other studies with male and female children confirmed that pictures of overweight children are generally less liked; that when asked, diabetic children preferred their own condition to being overweight; and that generally children were more accepting towards a wide range of handicaps (ranging from missing limps to facial disfigurement) than towards obesity (see Rodin, et al. 1984).

Of course children are not alone in their prejudices. Obesity certainly is not socially accepted, as summarised in the best-selling Beverly Hills Diet "Being fat is an obscenity - we are shunned, scorned, and ridiculed. A failure for all to see and mock." (Mazel 1981). A review of several studies, which examined the prejudice against people who are overweight; found strong indicators that obese individuals were consistently attributed with negative characteristics like being unattractive, unsuccessful and not influential (Gilbert 1986). Attitudes influence behaviour and consequently studies have found that people are less inclined to help an obese person than a thin one, obese women are less likely to be accepted at college or for a better job and they are seen more negatively by helping professions.

Despite these negative perceptions and obvious disadvantages of being overweight the incidence of obesity in Europe, which had decreased during the war and post-war period, has since increased and is now above the pre-war level (Pakesch, et al. 1992). One study found that 6% of men and 8% of women in the UK had a Body Mass Index (BMI) of more than 30 kg/m^2 and thereby fulfilled the WHO criteria for being obese (Rosenbaum, et al. 1985). A further 34% of men and 24% of women fell in the overweight category with a BMI between 25 and 30 kg/m^2. The average weight of the population and the ideal of slimness seem to run in opposite directions, and is particularly pressurising for women. Whereas the average weight for women is increasing, the ideal shapes as portrayed in magazines and pageants are becoming increasingly thinner. As a result, a far larger proportion of females are dissatisfied with their bodies and believe they are overweight than is actually the case (Halmi, et al. 1981). Another study asked men and women to pick their actual as well as their desired figure from amongst different silhouettes (Fallen & Rozin 1985). Whereas men did not show any significant discrepancy between actual and desired shape women expressed significant body dissatisfaction by choosing consistently thinner shapes. Similar studies were undertaken with children (Collins 1991) and came to the conclusion that girls as young as six or seven demonstrated the onset of disparate figure perceptions and expectations regarding thinness among females.

2.4.2. History of bulimia nervosa

Whereas the symptom of bulimia has been recognised since ancient history, opinions among researchers in this field differ as to whether the emergence of bulimia nervosa as a syndrome is of recent origin. The following section will portray the history of the term bulimia and explore how the concept of bulimia has changed over the centuries.

Usage of the term bulimia can be traced back to ancient Greece, where it described a superlative state of hunger or famishment. Bulimia derived from the Greek word bous (= ox) and limos (= hunger) and basically described such a hunger that an individual could eat an entire ox or is famished enough to eat like an ox. A wide range of variants like bulimy, boulimus, bolismos, adephagia, fames canina, etc. have been used over the past 2000 years in medical literature to describe the symptom of eating large amounts of food.

Parry-Jones & Parry-Jones examined references to bulimic subjects in English languages sources from the 17th to 19th centuries (Parry-Jones & Parry-Jones 1991). They found the earliest mention of bulimia in the Oxford English Dictionary (1398) in reference to the English translation of "De prorietatibus rerum" by Bartholomeus de Glanville, a work that is commonly regarded as the encyclopaedia of the Middle Ages. Under the heading "Of bolismus unmoderate appetite" the following description is given:" A man hath undewe appetyte, and eteth more than the comyn doinge is, and yet of his greate eatynge the bodye is not amended but is rather made lene and wasted." (Glanville 1482, cited in Parry-Jones & Parry-Jones 1991, p.136). According to this description, the sufferers experienced weight loss despite the amount they ate, but no reference to concerns about weight or rather the wish to loose weight by inducing vomiting, swallowing parasites or other methods was made. It was seen as a condition that affected the stomach or following Galenic (AD 130-200) theories a digestive dysfunction. The same cause was still assumed 300 years later by James the author of "A Medical Dictionary" (James 1743). James dedicated more than two pages to 'true boulimus' and gave a detailed description of

symptoms, aetiology, differential diagnosis and finally treatment. Like Galen he saw the disorders of this type as digestive dysfunctions that are caused by cold humor affecting the stomach. James distinguished true boulimus from similar disorders associated with worms, pregnancy, and ulcers. He added that it could involve an intense preoccupation with food and that some patients experienced vomiting after eating large amounts of food but that those suffer from so called caninus appetitus. "In the caninus appetitus, there is a desire after much food and great quantities are eaten, which, oppressing the stomach, are again discharged by vomit. The patient thus being relieved, his appetite returns, which having gratified, he finds himself obliged to ease his stomach again, like a dog, by vomiting. In the true boulimis, there is a ravenous hunger and eating, but instead of vomiting, the patient suffers from lipothymy [fainting spells] (James 1743), quoted in Stein & Laasko 1988, p.207). As a treatment plan he advised the ingestion of warm animal fat or extremities and the evacuation of the humor from the stomach.

Parry-Jones & Parry-Jones summarised 12 case reports from the 17th to 19th century who they diagnose as having suffered from a form of bulimia (Parry-Jones & Parry-Jones 1991). To give an example I refer to case 2: "A male, aged 50, " from his youth was wont, with a strange kind of greediness, to take in all sorts of food, and as speedily to eject them." His voracity was intermittent, lasting about 20 days, and for a similar period afterwards, " he ate sparingly, and lived in good health" (Parry-Jones & Parry-Jones 1991, p.131).

Looking at these cases it was first of all striking that the majority consisted of men, whereas today's bulimic population consists of approximately 90% females. All patients were described as having extreme hunger states, some vomit or fast, and purely physical reasons were not excluded, and no reference to a concern of becoming overweight was made. It therefore doesn't appear justified to me to see cases like the one above as historical predecessors of today's bulimics, although they might share some of the symptoms.

The end of the 19th century brought an increased scientific interest in the symptom of bulimia and the link between anorexia nervosa and bulimic symptoms was recognised. Gull mentioned overeating as a symptom in the case history of an anorexic woman and wrote "occasionally the appetite was voracious, but this was rare and exceptional" (Gull 1873 quoted in Casper 1983, p.6). Physicians and psychiatrists from different European countries presented different concepts of bulimia. In Germany, Soltmann described bulimia as a mere symptom of disorders of 'hyperorexie' which describes the constant nibbling of small amounts of food, particularly at night (Soltmann 1894). Sufferers claim that they would feel dizzy or faint if they did not do so. Soltmann found this disorder particularly prevalent among "overexcited hysterical chlorotic young girls" especially common in boarding schools and it is doubtful whether it is purely neurotic or of biological origin. In France, Blachez (Blachez 1869) gave a summary of the historical use of the term boulimie, either as a symptom or a distinct syndrome (see Stein & Laasko 1988). Blachez differentiated between two subtypes: firstly 'cynorexia' (Boulimie is accompanied by vomiting, possibly associated with hot climates) and secondly 'lycorexia' (extremely fast digestion of food due to rapid intestinal contractions). According to Blachez, boulimics showed the following characteristics: 1) offensive breath and body odour and a heavy urine, 2) they may engorge repulsive foods if deprived, 3) notably reduced intellectual abilities, 4) possibly the existence of digestive problems like colics or vomiting, and 5) true boulimie was sometimes seen in pregnant women and frequent among diabetics. Blachez saw the disorder as a functional or gastric neurosis, which occasionally alternates with symptoms of anorexia nervosa in females. As treatment he recommended the use of opiates or atropine to numb the stomach.

Only with the beginning of the 20th century did bulimia become regarded as a mainly psychiatric disorder and was seen by many as a kind of addiction or obsession like gambling, drinking and kleptomania. Janet published "Les Obsessions et la Psychosthenie" in 1903. It was a collection of 236 cases, of whom 4 showed evidence of bulimic behaviour (see Pope & Hudson 1988). The best-described case was that of Nadia, a 27-year-old single woman from a high social class, destined to

occupy a prominent place in society. Apart from bulimia she suffered from a major depressive illness, agoraphobia, obsessive-compulsive disorder and last, but not least, anorexia nervosa. Nadia described that she did not feel loved as a teenager and that she became terrified of growing bigger because she wanted to remain a little girl. Nadia fitted to a much higher degree the prototype of today's bulimic; she is female, of higher social economic status and associated pressures, she expressed weight concerns and also the existence of other psychiatric disorders is common among bulimia nervosa sufferers. Still, opinions differ as to whether Nadia was a description of an anorexic or in fact a bulimic.

Habermas claimed that Binswanger's presentation in 1909 is the earliest case of a non-anorexic with all the clinical features, which are today required to justify the diagnosis of bulimia nervosa (Habermas 1992). A slightly later example is Wulff's paper on four cases with bulimia at normal weight, he defined the clinical syndrome in terms of four behaviours: binge eating, hypersomnolence, apathetic depression, and the disparagement of body image (Wulff 1932). Wulff saw this eating pattern not as an unacceptable drive, but the oral satisfaction of severely regressed individuals or the "spiritually degenerated condition of a person who has fallen to a low moral level." Undoubtedly the most famous case description of bulimia nervosa from the first half of this century is Binswanger's study of Ellen West, (Binswanger 1944). In this the patient gave a moving account of her desperate struggle with binge eating, followed by occasional episodes of vomiting and laxative abuse (see Casper 1983).

In my opinion the symptom of bulimia reaches back over centuries but only with the beginning of the 20th century do the case descriptions share enough features with the syndrome of bulimia nervosa to be seen as suffering from the same disorder. But to whatever year one dates the beginning of the syndrome of bulimia nervosa (in the sense it is presently used) there is no dispute that until the 1970's these cases were uncommon and rarely documented. Not surprisingly previous diagnostic schedules like the DSM I (American Psychiatric Association 1952) and the DSM II (American Psychiatric Association 1968) register neither bulimia nor bulimia nervosa.

Towards the end of the 1970's more and more clinical reports began to appear concerning a "new" eating disorder which was mainly characterised by frequent episodes of uncontrollable binge eating, followed by guilt and the compulsion to lose weight by either purging or fasting, along with extreme concerns about weight and shape. Patients with this disorder usually had a body weight within the normal weight range, which was why Bruch called them "thin fat people" (Bruch 1973). The disorder itself was labelled "bulimarexia", "dietary chaos syndrome", or "bulimia" and in 1979 Russell coined the term bulimia nervosa, which was consequently established in diagnostic schedules like the DSM III-R (American Psychiatric Association 1987).

Previously, we investigated the stability of the syndrome of bulimia nervosa by comparing two cohorts of bulimic women (Schulz & Freeman 1995). The first cohort was studied shortly after Russell's initial definition of the disorder (1982-1984) whereas the second cohort was assessed ten years later. Despite a marked increase in prevalence and the increase in 'popularity' the two generations of bulimic women were remarkably similar in age of onset of disordered eating, symptom-pattern and social class. The main difference between the two cohorts was that the newly assessed sample generally had more psychopathology associated with their bulimia nervosa.

2.4.3. History of Anorexia Nervosa

The term anorexia comes from the Greek 'an' (= want/ lack) and 'orexis' (= appetite) and describes the loathing of food, or inappetency. Another term describing the loathing of food and a squeamishness of the stomach is 'fastidium' which occurred in Latin sources, but also appeared in some English texts (Parry-Jones 1991). Anorexia nervosa literally means the absence of appetite of nervous origin, a term which is somewhat misleading given that most anorexics are extremely hungry, but try to suppress this in order to remain thin. Self-starvation would probably be a better term, but undoubtedly the term anorexia nervosa is now well established and even lay people are more or less familiar with it.

One of the earliest descriptions of starvation is engraved on a granite tomb in Egypt from 187 BC:

> *"I am mourning on my high throne for the vast misfortune, because the Nile flood in my time has not come for seven years! Light is the grain; there is lack of crops and of all kinds of food. Each man has become a thief to his neighbour. They desire to hasten and cannot walk. The child cries, the youth creeps along, and the old man; their souls are bowed down, their legs are bent together and drag along the ground, and their hands rest in their bosoms. The counsel of the great ones in the court is but emptiness. Torn open are the chests of provisions, but instead of content there is air. Everything is exhausted."* (Keys, et al. 1950, quoted in Bruch 1973, p 10).

Famines were something unavoidable at that time, but from early on in human history deliberate fasting was used. Regulation of food intake is one of the earliest treatment methods available to physicians and it has been claimed that in fact the history of diets is as old as medicine itself (Vandereycken & van Deth 1994). Already in Hippocrates' writings, specific diets were advised to prevent diseases or to cure illnesses. Another voluntary use of fasting was in the context of religion. It is important to realise that fasting was not a creation of Christianity but that it evolved in different religions, cultures, and geographical regions. For the Christian religion alone Vandereycken & van Deth found a wide variety of motives as to why fasting was introduced and used. It was seen as a form of mortification and penance, something that united the Christian community, the poor could be fed, and it allowed the expression of grief over Christ's suffering. Church Fathers believed that by not eating, people would find their way back into paradise because after all Adam and Eve were expelled after having broken God's fasting rules.

In Europe between 1200 and 1500 chronicles and hagiographies showed that many women prolonged fasting and gained miracle status (Brumberg 1988; Habermas 1990; Vandereycken & van Deth 1994). Their eating behaviour was documented because the survival on no or extremely little food was regarded as a miracle and a phenomenon that could lead to canonisation. Although fasting was a common feature

of medieval spirituality, men did not seem to engage in it to the same degree and there are only few male saints who claimed that they did not or could not eat. Catherine of Siena (1347-1380) is arguably the best known of these saints. She ate only a handful of herbs and when forced to eat other food would induce vomiting by sticking a twig down her throat (Brumberg 1988). As well as excessive fasting some would engage in additional ascetic practices like piercing their tongues or cheeks, flagellation, wearing shoes with pointy nails and sleeping on beds of thorns or iron. These women were admired and awed because they voluntarily rejected what their contemporaries craved, namely a full stomach and good health. As a result of this admiration many ascetic saints made careers in the church hierarchy.

By the end of the 15th century cases of prolonged fasting aroused more scepticism than awe. The picture of the female saint changed and cases were detected where women claimed they would not eat but were found with hidden food. Extreme asceticism became suspicious and charity (expressed in the founding of hospitals and orphanages) and teaching became the focus of female saints. The church now actively discouraged extreme fasting practices and checked and observed reported cases. Particularly from the end of the Middle Ages onwards, several fasting women underwent formal trials because of disobedience or were questioned by the Inquisition on charges of witchcraft. Although religious inspired fasters appeared up into the 20th century, their number markedly decreased from the 17th century onwards. This can be attributed to the reservations of the Catholic Church, the increasing influence of Protestantism, and the development that prolonged fasting became more of a spectacle (with hunger artists making fame and a living out of it) than a miracle.

When we compare anorexia mirabilis with anorexia nervosa there are common features. Most fasters were women, they chose to deprive their bodies of food and a number died of the consequences of self-starvation. On the other hand, significant differences can be observed. Firstly, not all fasting saints were actually emaciated; their body weight did not have seemed to matter to them nor was it a criterion for

canonisation. Secondly, fasting was embedded in ascetic Christian culture and very often was only one practice among many others. It seems that modern historians focussed on the aspect of food refusal because of the parallels with anorexia nervosa but that they neglect the other ascetic aspects (Habermas 1990). It should be remembered that medieval women were preoccupied with eating and fasting because it was a way to express contemporary religious ideals of suffering and service to fellow human beings (Bynum 1987). For example Angela of Fogligno (see Brumberg 1988) ate the scabs and lice from the bodies of the sick and ate the pus from their sores claiming that it tasted "sweet like the Eucharist". In contrast to this women with anorexia nervosa usually "just" fast but do not do any other harm to their bodies. Today's anorexia nervosa can't be interpreted as a service to others but is more often perceived as the desperate struggle for autonomy and control over their own body.

For centuries fasting saints, miraculous maidens and hunger artists have exercised food abstinence. But from the 17th century onwards it was increasingly seen as a medical problem and gained entry in dictionaries under "anorexia, a sickness characterised by having no appetite" (1651) and "anorexia, a queesinesse of stomack" (1658) (Parry-Jones 1991). Richard Morton's 'Treatise of Consumption' (1689) was credited by many with the earliest report of modern anorexia nervosa. He described the 'nervous consumption' of an 18 year old girl as follows:

> *"In the month of July she fell into a total suppression of her Monthly Courses from a multitude of Cares and Passions of her mind, but without any Symptom of the Green-Sickness falling upon it. From which time her Appetite began to abate, and her Digestion to be bad; her flesh also began to be flaccid and loose, and her looks pale... she won't by her studying at Night, and continual poring upon Books, to expose herself both Day and Night to the injuries of the Air... I do not remember that I did ever in all my practice see one, that was conversant with the Living so much wasted with the greatest degree of a Consumption (like a Skeleton only clad with Skin) yet there was no Fever, but on the contrary a coldness of the whole Body... only her Appetite was diminished, and her Digestion uneasy, with Fainting Fits, which did frequently return upon her"* (Morton, 1689, quoted in Bruch 1973, pp. 211, 212).

Unfortunately, the girl refused treatment and died three months later. Morton also presented the case of a young man suffering form this disorder but gave no further information about sex ratio. He attributed this kind of assumption to "the imoerate drinking of Spirituous Liquors and an unwholesom Air" but acknowledged psychological reasons like "sadness and anxious cares" as predisposing factors. (Vandereycken & van Deth 1994). Morton's work was repeatedly reprinted and translated into several languages but it took another 200 years before anorexia became a well-known medical entity.

It was William Gull's achievement to conceive of anorexia as a coherent disease entity and to differentiate it from the starvation among insane asylum inhabitants as well as from organic disorders like tuberculosis, diabetes, and cancer (see Brumberg 1988). Gull had initially used the term 'apepsia (= indigestion) hysterica' but coined the term 'anorexia nervosa' in 1874. Gull was struck by the excessive restless of his patients despite their severe emaciation. Around the same time Lasègue in France (Lasègue 1873) reported eight cases that suffered from 'anorexic hysterique'. His patient were girls between the ages of 15 and 20 who experienced an emotional upset which led to a loss of appetite, the refusal to eat and as a result of this, severe emaciation. Comparing the descriptions of Morton, Gull, and Lasègue remarkable similarities can be found (Vandereycken & van Deth 1994). Firstly, the illness concerned mostly girls and young women. Secondly, a marked emaciation could be found as a result of an extreme decrease in food intake, which was often accompanied by amenorrhoea and constipation. Thirdly, patients appeared extremely restless or hyperactive and demonstrated a lack of insight in their condition. Fourthly, no organic reason could be found, therefore a mental or nervous origin must be considered.

Despite these similarities marked differences in opinions concerning definition and aetiology can be found. These differences can be partly explained by their different professional backgrounds. Gull was a physician to the English court; he strictly concentrated on medical aspects of differential diagnoses and saw a 'central origin' to

the disease. Gull stated that anorexic women would come from families willing and able to expend financial and emotional resources, whereas Lasègue, a neuro-psychiatrist, provided more than a glimpse in the private world of middle-class families and their relationships to their daughters. Lasègue was the first to suggest that food refusal constituted a form of intra-familial conflict between maturing girls and their parents.

Casper (Casper 1983) was able to find 13 case reports (about 25 different patients) of anorexia nervosa between 1689 and 1900 and other researchers (Habermas 1990; Silverman 1992) have found some more case reports in the English, French and German medical literature. Most of these reports originated in the late 19th century, which leads to the question - why did the history of modern anorexia start at this particular time in history? To answer this question we have to take a look at the family and family values in Victorian times. Family was conceptualised as a 'haven in a heartless world' and the boundaries between public and private life were carried to the extreme. The child became the centre of attention and great care and interest was lavished on it. Girls, probably physically mature earlier than before, remained longer in the family and marriage was often delayed to the mid-twenties. According to Brumberg this prolongation of dependency seemed to have added to the intensity of parental love and one way to rebel against this was the refusal to eat (Brumberg 1988). Eating and dining were extremely important features of Victorian society and the adolescent girl had the power to disrupt their family. Her appetite (or lack of it), her diet, her digestion would easily become the centre of conversation and attention. Another difficulty for the adolescent girl from the late 19th century was the conflicting role models. From the 1870's on, young middle-class women began to seek a new self-image, intellectual fulfilment and profession. But this was often regarded as a violation of Victorian ethics and the 'natural vocation' of motherhood. In this situation it might have been a terrifying process to make this choice and maybe like Nadia (Janet 1906) girls did not want to grow up. As the previous section about the history of obesity showed the increased aversion toward obesity started at about the same time as anorexia nervosa (Bruch 1973). Whereas for men the preservation of health was the main focus, medical reasons played only a minor role

for women. To a much higher degree aesthetic reasons i.e. the wish for an elegant, slim figure dominated the 'battle against fatness'. For today's anorexics the ideal of slimness and beauty are of utter importance and it seems plausible that 100 years ago women came to much the same conclusions.

With increasing interest in anorexia nervosa and more and more reports and hypotheses about aetiology and treatment, the picture became even more confused when Simmonds, a German pathologist, found in 1914 destructive lesions in the pituitary gland of an emaciated women (see Bruch 1973). 'Pituitary cachexia' or 'Simmonds' disease' was soon regarded as a possible cause for numerous forms of uncommon emaciation and instead of psychological reasons any case of malnutrition was attributed to some endocrine disturbance. The only treatment available was the administration of hormones in order to restore the supposed shortage. It was actually a Scotsman, Harold Sheehan, (Vandereycken & van Deth 1994) who brought an end to the confusion about the endocrine or psychogenic origin of anorexia nervosa by proving that malnutrition was not typical of pituitary insufficiency and that the fatal case of Simmonds had in fact died of a thrombosis. From the 1930's onwards anorexia nervosa returned to the psychiatric textbooks.

The period between 1945 and 1960 was strongly dominated by psychoanalytic views, which focused on the disturbed eating function, the oral component. Anorexia was viewed as a form of conversion hysteria; the fear of food intake was interpreted as the unconscious fear of oral impregnation. Bruch summarised the beginning of her 40 years of experience in treating anorexic patients by stating: "I looked eagerly for such fantasies in my patient. When I did not find them, I reassured myself that she had not stayed long enough at the Clinic for them to be discovered." (Bruch 1985, p.8). Hilde Bruch did not look too long for impregnation fantasies but instead focused on the lack of self-esteem, the distorted body image and the wish to be thinner in her anorexic patients and thereby changed the approach to anorexia nervosa drastically. A variety of divergent views have been developed and the rivalry between biological, psychodynamic, learning theory, feminist, family systems and other views continues unabated.

3. A question of how, when, how much and what to eat

The previous chapter has given an overview of historical and social changes that have influenced our present society with its particular set of dietary practices. However within these parameters there is still a diversity of eating practices and food choice. For example although carrots may be socially acceptable, cheap, widely available and perfectly healthy - not everybody likes them. Individuals of the same culture differ in their food preferences and aversions, with most of them acquired by experience or, in other words, learning.

The development of the motor movements required for chewing and swallowing of food is limited by maturational processes, but with practice appear in all healthy members of the human species. What are of greater interest for the present study are aspects of eating like control of food intake, acquisition of rules of eating, food choice and eating behaviours. Psychodynamic as well as learning theory approaches emphasised the significance of early eating and feeding experiences for the development of eating disorders but the main focus of this chapter will be the development of 'normal' eating behaviours.

Learning about food and eating begins at birth. Even neonates show signs of appetite, they can differentiate tastes and have preferences, and a substantial part of mother-child interaction takes place in the feeding situation. The implications and consequences of the choice between breast and formula milk will be discussed with regard to behavioural patterns, mother-child interactions and possible long-term effects. Long-term effects to an even greater extent have been observed as a result of under- or malnutrition. That is why this chapter commences with a section about early nutrition and its impact on health, function and achievement. In the framework of eating disorders malnutrition is also of interest as even women with an active eating pathology get pregnant and have babies. The lower average birth weight of infants of anorexic mothers (Treasure & Russell 1988) might be interpreted as the effect of gestational malnutrition (for a more detailed review see section 4.1.3.).

3.1. Importance of early nutrition for development

The following section will briefly examine the effects of malnutrition on brain and general development. Although malnutrition is commonly regarded as a problem of the past, or of developing countries, unfortunately this is not the case. In January 2002 the Evening News (Swanson & Diggines 2002) reported that one in six children seen at Edinburgh's "Sick Kids" hospital showed signs of malnutrition. A finding like that is gloomy in itself, but also leads to the question of whether subsequent long-term consequences have to be expected, and if so, are these reversible or permanent?

In this context, Lucas introduced the concept of nutritional programming (Lucas 1991). He proposed that 'programming' occurs when an early stimulus or insult, operating at a critical or sensitive period, results in permanent or long-term change in the structure of the organism.' (Lucas 1991 p. 39). Critical and sensitive periods are often used synonymously although their meanings are different (Smart 1991). A sensitive period is defined as a stage at which certain aspects of development occur with the greatest ease. In contrast, the term critical period implies a crisis and abruptness and therefore should be used only as a special class of sensitive periods.

To assess long-term consequences of malnutrition on cognitive development we have to look at changes in the structure of the brain. For obvious reasons most studies about brain morphology have been undertaken on animals, mainly rodents. For rats the principle effect of under nutrition is to slow down brain growth processes and thereby causing deficits in growth attainment (Smart 1991). Bedi's review of studies supported this conclusion by stating that under nutrition caused deficits in body and brain weight and furthermore led to alterations in the structure of the brain (for example reduction in number of cortical glial cells and synapse to neurone ratio) (Bedi 1987). Some of the deficits might disappear with nutritional rehabilitation; others seemed to be of a permanent nature. In particular, if the phase of malnutrition included the gestational period the animals were not able to 'catch-up' in performance with their counterparts without a history of malnutrition. This implies that for rats the

gestational period is a sensitive one for brain development. Also specific deficiencies (e.g. iron deficiency) have been shown to cause permanent brain alterations and consequently performance deficits (Morley & Lucas 1997). Nutritional programming has been shown to influence a number of metabolic, developmental and pathological processes in animals (Lucas 1991). Although animal studies are helpful to establish principles or mechanisms of how nutritional deprivation effects performance, caution is advised in generalising the results of animal experiments results to humans.

One way of studying nutritional programming lies in field studies. Most observational and interventional studies examining the effects of under nutrition were undertaken in developing countries. A review of such studies described under nutrition as 'protein-energy malnutrition' (Grantham-McGregor 1987). Protein-energy malnutrition included different conditions caused by nutrient deficiencies of varying type, extent, and duration and was usually complicated by various infections. The author proposed the following hypotheses to explain how malnutrition affects mental development, which are compatible with Lucas' concept of nutritional programming:

- Permanent anatomical changes and biochemical changes of the brain that affects function.
- Reduced levels of exploration and activity that leads to poor development
- Reduced activity of the child produces reciprocal unresponsiveness in the child's caretaker, which in turn has a detrimental effect on the child's development.

Most studies demonstrated that children with varying degrees of malnutrition performed less well than their well nourished counterparts (Morley & Lucas 1997) and that this disadvantage can be still found after the children have been re-fed (Grantham-McGregor 1987).

The above observational studies were commonly flawed by the fact that they were retrospective and that the undernourished children usually came from a very poor family background. Disadvantaged environmental conditions and malnutrition are frequently intertwined throughout a child's development and influence his physiological and psychological functioning (Galler 1987). In response to these criticisms interventional studies have tried to control confounding variables (Pollitt 1996). This was achieved by assigning four villages in Guatemala randomly to a dietary treatment consisting of high calorie, high-protein supplements vs. low calorie supplements. The supplements were freely available to pregnant women and children up to 7 years of age. Remarkably, benefits of the high-energy supplement could still be found in a wide range of cognitive tests at age 18. The relative advantage was greatest among subjects with a low socio-economic status who received supplements during the gestational period and the first two years of life. The author undertook another study in Columbia where the intervention consisted of supplements, healthcare and education. Improvements in a number of psychological tests could be demonstrated even if intervention started after the critical period. However Pollitt also stressed that the benefits were greatest the earlier intervention started and the longer it lasted.

In regard to specific nutritional deficits, iron deficiency anaemia in infancy has been reported to cause negative long-term effects on cognitive development even when adjustment for confounding variables was made (Morley & Lucas 1997). A circumstance that allowed the study of the effects of a specific deficiency in neonatal diet arose in the 1970's in the USA (Willoughby, et al. 1987). An apparent epidemic of failure to thrive was observed among babies fed with a specific soy-based formula. As it turned out, the formula missed chloride, which is essential for normal growth. Within the study, babies who received this formula were assessed and followed-up with the result that a dose-response relationship between length of exclusive exposure and measures of behavioural, cognitive and motor functioning could be established.

A fourth way of studying the effects of early nutrition on later development is a comparison and follow-up of breast vs. bottle fed babies. Lucas was able to conduct randomised controlled trials with preterm infants and to assess the children at age 7 (Lucas 1991). The results and inherent difficulties of these studies will be closer examined in section 3.2.1. At this point it is sufficient to say that feeding technique seems to have a broad spectrum of long-term consequences ranging from differences in behavioural pattern to intelligence measurements.

Studies on animals and humans seem to support the hypothesis of the existence of critical periods of brain development. The majority of studies on humans confirmed that malnutrition or sub-optimal nutrition could cause disadvantages in later development. But whereas researchers like Lucas claim that these disadvantages are of a permanent nature others like Pollitt argued that intervention consisting of nutritional supplements and educational stimulation produces benefits even after the critical period of rapid neuronal growth (Pollitt 1996).

3.2. The first contact with food

Originally the newborn baby is totally dependent on the caregiver for food. Food selection is not much of an issue because young babies consume milk exclusively, although of course the choice whether to bottle or breast-feed lies usually with the mother. A full-term baby will show signs of appetite and is equipped with a number of reflexes, which help him to find the food source and to make use of it. When the baby is touched on his lips or jaw he will turn his head in the direction of the touch, as he would react when touched by his mother's breast. This behaviour is called a rooting reflex. A further reflex is the suckle-swallow reflex that allows the baby to establish suckle feeding. During the sucking the lips enclose nipple and parts of the areola (or teat), the tongue moves backward and forward to compress the nipple rhythmically whereby milk is expressed. After one or two sucking motions a small reservoir between soft palate and tongue is filled with liquid and swallowing is initiated. The closure reflex allows the milk to pour straight down the throat without the closing of the trachea. This is a highly adaptive mechanism and ensures that

when liquid reaches the back of the mouth it goes down the oesophagus into the stomach and not down the trachea into the lungs (Booth 1994).

If the infant is breast-fed, a complex physiological interaction with the mother is initiated whereby sucking at the breast stimulates neuroendocrine neurones in the mother's central nervous system. These stimulated hypothalamic neurones have axons down to the posterior pituitary gland and secrete a hormone, oxytocin into the blood stream. Oxytocin contracts the surrounding cells of the alveoli in the breast and thereby causes the milk to flow. But sucking does not only stimulate the release but also the production of milk through the release of Prolactin, an anterior pituitary hormone (Drewett, et al. 1998). Stimulation of the nipple is not even necessary to produce the let down of milk. For a lactating women, seeing her baby or hearing it cry, can produce anticipatory milk letdown, which is another example of the complex relationship between mother and child in the feeding context.

At the beginning of the post-partum period the milk consists mainly of colostrum, which has a high density and low volume to ensure that, even in the small quantities consumed, the baby receives all the nutrition it needs. Additionally colostrum contains enough immunoglobulins to prevent infections. Over the first 14 days of life the milk gradually changes into mature milk with its main ingredients:

Lactose (breast milk's main source of carbohydrates, essential for the development of the CNS and helps the baby to absorb calcium and iron)

Lactoferin (protein, helps the infant to absorb iron and inhibits the development of certain harmful bacteria in the bowel)

Interferon (anti-viral factor essential to fight viral infections)

Long chain polyunsaturated fatty acids (LCPs) (acids vital for the development of optic system and the CNS)

Although the ingredients are always the same, mothers vary in the exact composition and amount of milk they produce. Despite all efforts by the food industry it has not been possible to match formula milk to breast milk and differences in feeding pattern and long-term benefits are the result.

3.2.1. Feeding patterns of bottle and breast-fed babies

Over thousands of years the use of human lactation was the normal way of feeding a baby. Only in this century with the invention of formula milk has a real alternative been presented and by the 1950's the majority of mothers chose to bottle-feed (see section 2.3). The following section will focus on the consequences this choice has on behavioural as well as on physiological aspects.

When mothers of breast-fed and bottle fed babies were asked to record the feeding patterns of their children marked differences emerged (Wright 1991; Wright 1993). Formula fed babies were usually offered the same amount of food at comparatively regular intervals, whereas breast-fed babies soon developed more variation. In the first weeks of life they took roughly the same amount of milk every meal but they appeared to be hungrier and some babies had to be fed every two to three hours. At the age of 6 to 8 weeks a pronounced diurnal rhythm developed with the largest feed lying in the morning and decreasing toward night. This pattern reversed when the babies were 4 to 6 months old with the biggest feed now lying in the evening. The author interpreted this as a sign of learning as the infant was able to anticipate longer periods without food and acted accordingly.

The same study also examined the sleeping patterns of infants and found that in retrospective as well as in prospective studies mothers of bottle-fed babies reported that their babies reached the developmental milestone of sleeping through the night at a significantly younger age than fully-breast fed babies (Wright 1991). The finding of diverse sleeping patterns could be linked with another difference, namely that bottle-fed babies were earlier weaned than breast-fed babies. A survey in Cambridge discovered that bottle-fed children were given solid food at an average of 10.6 weeks

for boys and 13.9 weeks for girls, whereas the average for breast-fed babies was 14.9 and 17.4 weeks respectively (Whitehead, et al. 1986). Notable in this context is also the impact the sex of the baby had on early feeding patterns. As discussed in section 2.1, in our society it is a commonly held belief that males need more food than females independent of size. One could argue therefore that mothers of boys earlier assume that milk alone it not sufficient for the babies' dietary needs.

Health professionals, and even food manufacturers, generally recommend the introduction of solids not before 16 weeks of age. Wright explained the finding that bottle-feeding mothers apparently introduced solids earlier than recommended with the return of night wakening which the mothers interpret as signs of hunger (Wright 1991). At four months of age most breast-fed babies are not used to sleeping through the night anyway, therefore a change is not observed and the assumption that the infant needed more than milk was not made. This explanation leads us to the question of hunger recognition and control in the feeding situation.

One measure of control is who determines the pacing of the feed. The feeding process is generally not continuous and unbroken but is interrupted by a number of reasons like choking, winding, loosing the teat or nipple, etc. Wright examined the breaks within filmed feeds of breast and bottle fed infants (Wright 1993). He observed that in the case of bottle-feeding the interruptions were almost entirely initiated and thereby controlled by the mother. In contrast to that, the pacing of the breast-feeds was almost entirely determined by the baby. A review of studies about the quality of mother-child interaction in the feeding situation stressed the importance of the baby's initiative and the reciprocity with which mother and child take turns in action and response (Charone 1982). The author reported contradictory findings in regard to this topic. On the one hand studies came to the conclusion that breast fed babies are more in control and more actively involved in the feeding process because they have to root, turn the head and grasp the nipple (Wright, et al. 1980). Furthermore during breast-feeding the mothers touched the baby, looked at it and smiled more often. Overall the maternal behaviour appeared to a greater extent

related to what the baby was doing than with bottle-feeding mothers (Richards & Bernal 1971; Dunn 1975). On the other hand, Field's study could not find significant differences between the two groups in regards to maternal behaviours (Field 1977).

Not only the pacing but also the question when to start and when to terminate feeding is an expression of control in the feeding interaction. Birch & Fisher argued that for the infant inter-meal intervals are the main mechanism of controlling food intake (Birch & Fischer 1995). For a young infant food selection is not an issue and meal-size it somewhat limited by his gastric capacity. As discussed in section 2.3 the popular advice in the first half of this century was to follow a strict feeding schedule with inter-meal intervals of 4 hours. This changed in the 1960's with the growing popularity of Dr. Spock who recommended breast-feeding and in particular feeding 'on demand'. The authors pointed out that it is comparatively easy for bottle-feeding mothers to control the food intake of their infants because they know how much he/she is consuming. In contrast to that the breast-feeding mother lacks this knowledge and she is therefore more likely to feed on demand which gives the baby more control of timing and meal-size. As a result of this the infant learns to associate hunger with meal-initiation and satiety with the termination of eating.

Naturally this association depends on the mother recognising that the infant is hungry. As stated above, breast fed infants were found to be more likely to develop a varied meal pattern across the day or in other words breast feeding mothers were more likely to recognise and respond to variation in hunger (Wright 1993). When mothers of 2-month-old babies were asked how they identified these variations they offered a wide range of behaviours and reasons that Wright classified into the following five categories.

1) **Avidity measures:** comments concerning the intensity, speed and duration of sucking
2) **Distractibility:** the baby is seen as hungrier the less distractible it is
3) **Cries and screams**
4) **Very frequent feeding**
5) **Maternal inference:** the mother makes an inference to support the claim for increased hunger like 'has gone all night without food and therefore must be hungry'

The author showed that the feeding technique had an impact not only on the recognition of hunger variation, but also on the cues the mothers responded to. Among bottle-feeding mothers intensity of sucking was the most common reason given, whereas it was frequency of feeding for the breast-feeding mothers. Interestingly the mothers also differed in reports of the time of day when their babies were perceived as being most hungry. Bottle-feeding mothers cited feeds at the beginning of the day (often after an overnight fast) and breast-feeding mothers regarding late afternoon as the hungriest time.

Also for the decision when to terminate a feed both groups seemed to look at different cues. Breast-milk has been shown to still be available at the end of feeding (Neville, et al. 1988). This finding led the authors to the conclusion that with breast-feeding the meal-size was determined by the infant and not by maternal factors. In direct observations of infant feeding behaviour several stages in the process of terminating a feed were noticed, like the slowing down of sucking rate and drowsiness. If feeding continued the infant refused to open its mouth and finally spat the teat/nipple out. For breast-feeding mothers the most common cue for terminating feeding was that the infant was sleepy or fell asleep. In comparison bottle-feeding mothers were more likely to continue feeding until the baby spat the teat out. Based on this finding it appears more likely that bottle feeding mothers override early signs

of satiety which could have implications for later eating behaviour and obesity (Wright 1981).

So far this section has concentrated on the behavioural differences of infants that are either bottle or breast-fed. However the majority of studies investigating the consequences of feeding techniques focus on issues like health, weight, and mental and motor development.

In vitro studies and clinical trials have produced convincing evidence that breast-feeding offers immunological benefits like lowering the incidence of otitis media (Duncan, et al. 1993) and gastro-intestinal tract diseases. Some of the studies were undertaken in developing countries, others in industrialised countries (Eaton-Evans & Dugdale 1987). The latter authors investigated the incidence of gastro-intestinal infections in infants in southeast Queensland. Their prospective study followed babies between 0 and 12 months who were either breast, bottle or mixed (breast and bottle) fed. A comparison of the incidence of reported episodes of vomiting and/or diarrhoea showed that up to 6 months of age the breast and mixed fed babies were less likely to get ill than those who didn't receive any breast milk at all. After this age breast-feeding didn't reduce the risk of gastro-intestinal infections significantly. Particularly in developing countries (with limited supplies of clean water etc.) the promotion of breast-feeding has proved to be of vital importance for the fight in reducing common childhood diseases and mortality rates. Farb & Armelagos called attention to the fact that for example in Chile a labourer would have to spend circa 20% of his income to buy formula milk for one child (Farb & Armelagos 1980). What's more the mortality rate of 3 months old bottle-fed babies was 2½ times higher than for breast-fed babies.

There are numerous other health benefits which have been linked with breast-feeding, for example reduction of respiratory infections, neonatal infections in low weight babies, allergies and even a lower incidence rate of sudden infant death syndrome (see Campbell & Jones 1996; Hartley & O'Connor 1996). Of course

breast-feeding doesn't guarantee the health and thriving of babies. If a baby is irritable and fretful it might be difficult to establish sufficient feeds of long enough duration to obtain the fattier hind milk. Additionally maternal stress, tiredness or malnutrition can adversely effect lactation so that the infant can become malnourished. Still, evidence of the health benefits of breast-feeding has been so strong that organisations like the World Health Organisation and UNICEF have given the promotion of breast-feeding priority.

Wright stated that there is a widespread belief amongst clinicians that breast-feeding reduces the risk of rapid weight gain and subsequent adiposity but that conclusive evidence is still lacking (Wright 1993). One survey found that growth velocity and weight gain from the third month was less among breast-fed babies (Whitehead, et al. 1986). This was particularly true for boys when solids weren't introduced before 16 weeks of age. The authors stressed the importance of the time of weaning (which as discussed earlier is linked with the choice of feeding method) and conclude that early-weaned babies have similar growth pattern to those infants who are bottle-fed. Prolonged breast-feeding and delayed introduction of solids (after 5 months) combined with a vigorous infant feeding style has been associated with greater adiposity at age 6 (Agras, et al. 1990). Also Lucas argued that the early energy intake, and not just 'fatness' as a baby, needed to be correlated with later obesity (Lucas 1991). However in contrast to Agras, Lucas' study came to the result that breast fed babies had a lower energy intake than bottle-fed babies. As support for his statement, Lucas referred to Kramer (Kramer 1981), who found that breast-fed (in comparison to bottle fed) babies received some protection against obesity in later childhood and adolescence, even after adjustment for confounding factors. It has to be emphasised that overweight infants do not necessarily become obese adults (Wright 1981; Drewett, et al. 1998). Poskitt stated that the age of onset of adiposity relates more closely to adult obesity than nutritional status in infancy does (Poskitt 1986). More recently, other studies have found that being overweight in infancy (1 to 3 years of age) did not increase the risk of adult obesity but that thereafter the risk steadily increases (Whitaker, et al. 1997) (see section 4.2.2).

Maybe the most controversial area in research about the long-term consequences of breast versus bottle-feeding is the link between mental development and feeding technique. Since Hoefer & Hardy's article in 1929 about later development of breast and artificially fed babies this relationship has been widely investigated and reported (Hoefer & Hardy 1929). Most of these studies came to the conclusion that there is a positive correlation between breast feeding and mental development in children of different age groups (see Florey, et al. 1995). However, so far it has proven impossible to control all possible confounding variables. From a research point of view it would be ideal to undertake a controlled trial where babies would be randomly assigned to different feeding techniques to determine the true effect of breast-feeding on development. For ethical reasons this would obviously not be possible and therefore it remains difficult to control for other variables that might influence the outcome of any study in this area. One brief overview of studies that looked at feeding technique and cognitive development offered the following three hypotheses to interpret the findings of these studies:

1) Cognitive differences derive from associated social class characteristics of the family
2) Cognitive differences derive from different interactions between mother and child during breast and bottle feeding, for example breast fed babies might experience more 'mastery' and are able to generalise this experience
3) Differences derive directly from nutritional differences between breast and formula fed babies (Drewett, et al. 1998)

A long-term study to examine the effects of breast milk on preterm babies ($\leq$ 1850g at birth) was undertaken (Morley, et al. 1988; Lucas, et al. 1992). The infants who took part in the study were entered into four controlled trials using a formula vs. enriched nutrient formula. Mothers chose whether or not to provide additional breast milk, which was fed by nasogastric tube while the infants were in hospital. A follow-

up of the children at 18 months of age revealed that the breast fed children had a significant advantage on mental development tests. Even after adjustment for social and demographic factors an advantage could be found (Morley, et al. 1988). In 1992 Lucas and colleagues published the results of a further follow-up at which point the children were 7½ to 8 years old (Lucas, et al. 1992). Again the children who had been breast-fed had a significant advantage in subsequent IQ even after adjustment for confounding factors (social class, mother's education, days on ventilation required, sex, age of mother). Furthermore a significant correlation between the amount of breast milk consumed and later IQ was found. The IQ of children whose mothers intended to breast-feed and couldn't, and those whose mothers chose not to provide breast milk were virtually identical. The authors interpreted this as evidence against the influence of parenting skills and health and postulated that their findings are consistent with the hypothesis that it is the composition (for example the presence of long-chain lipids, specific hormones and trophic factors) of breast milk that benefits neurodevelopment.

Publication of these findings provoked a brisk correspondence where other explanations were cited and aspects of the data analysis were criticised. Part of the criticism focused on parental factors like the method of assessing maternal intelligence (Wright & Deary 1992), parenting skills and general concern about the infant's welfare (Jacobson & Jacobson 1992; Houghton 1992) as well as smoking (MacArthur, et al. 1992). A later study investigated the relationship between adult intelligence and method of feeding in infancy in a cohort born between 1920 and 1930 (Gale & Martyn 1996). At that time the social determinants of breast-feeding were different; the majority of babies were breast-fed and only wealthier families could afford to buy formula milk. After adjustment for the effects of other confounding variables no association between adult intelligence and method of feeding could be found. Another follow-up study of very-low-birth weight babies (Doyle, et al. 1992) came to results, which were at odds with those of Lucas. The infants in Doyle's et al study were either formula fed, received expressed breast milk or were directly breast-fed. The authors found that children who received formula milk and those who received expressed breast milk had similar scores whereas

directly breast fed children had significantly higher scores on psychological tests. In contradiction to Lucas' conclusion, Doyle et al argued that it isn't the breast milk itself that is beneficial to subsequent intellectual development of premature babies but the act of breast-feeding. However, there was support for Lucas' hypotheses that long-chain polyunsaturated fatty acids are essential to the structural lipids of the brain (Crawford 1992; Beijers 1992).

Although there is still controversy about the possible explanation for any link between cognitive development and feeding method, the majority of research substantiated the benefits of breast-feeding even when obvious confounding variables (like social class) were excluded. This was not only true for preterm babies but also for babies born at full-term who, when followed-up, performed better on developmental tests as well as in later educational attainment (Drewett, et al. 1998). An investigation of mental and motor development at 18 months of age found significantly higher scores among breast fed babies on scales that measured mental development but no significant differences on motor development and behaviour after adjustment for a wide range of confounding variables (Florey, et al. 1995). Studies with children who were born with defects like mild neurological damage (Lanting, et al. 1994) or phenylketonuria (Riva, et al. 1996) were assessed at school age and it could be demonstrated that breast-feeding had a positive long-term influence on them too.

In summary, the choice to breast or bottle-feed an infant has a wide range of consequences. As studies have shown, breast-fed children seem to have more control over meal size and meal spacing because mothers have less information about how much their babies are consuming. Bottle and breast-feeding mothers respond to different hunger cues that might have implications for establishing the association between hunger and eating and it is still open as to whether incorrect learning might lead to later problems like obesity. There is convincing evidence that breast milk has immunological benefits and thereby helps to decrease the risk of childhood diseases. More controversial is the link between method of infant feeding and cognitive

development, although the majority of research in this field showed long-term benefits to breast-feeding. Because a randomised controlled trial with different feeding methods would be unethical the question of whether the benefits of breast-feeding were due to confounding factors like social class, different feeding interaction or the composition of breast milk itself also remains open.

3.3. Hunger and satiety

The following section deals with the regulation of food intake in humans or, in accordance with the overall heading, with the question of 'how much to eat'. Although chapter 2 highlighted the fact that our eating is limited by availability and social constraints most people would agree that hunger and satiety play a central role in initiating and terminating eating.

Particularly in the earlier years of research into hunger and satiety, studies focused on peripheral cues but with the discovery that lesions of specific brain regions influenced eating patterns the central nervous system was seen as increasingly important in the regulation of food intake. In recent years a more interactionist view has gained influence conceptualising food intake as affected by biological and environmental forces (Blundell & Halford 1994). In section 3.3.2 the role of cognition in the regulation of food intake will be explored in more detail. A major research programme undertaken by Birch and colleagues has investigated how children respond to internal signals of hunger and satiety and how learning and social context influence this process. Adults obviously have had learning experiences regarding food and eating and consequently studies examining factors that influence their food consumption (e.g. variety and palatability) will be introduced. Aberrations in the regulation of food intake are defining for eating disorders and a review of studies of hunger and satiety perceptions in eating disordered individuals will bring this section to a close.

The terms hunger, appetite, satiety and satiation are commonly used in various areas of science as well as in general conversation to refer to states and processes, which control and guide food consumption (Blundell, et al. 1988). Satiety and satiation can

be functionally distinguished with satiation describing a process that brings a period of eating to an end and satiety being a state of inhibition of future eating once a period of eating has ended. A clarification of the term hunger is more difficult and as Bruch pointed out, hunger is a complex concept with different meanings (Bruch 1969).

Firstly, hunger is used to refer to the physiological state of nutritional depletion, long-term starvation or to a wide spread famine. But hunger is also used to describe a psychological experience, namely the complex, unpleasant and compelling sensation an individual feels when deprived of food. Bruch saw appetite as desire for a particular food and thereby the more pleasant form of this experience. A third way of using the word hunger is the symbolic expression of a state of need in general or as a simile for want in other areas like, for example, the hunger for life. Bruch argued that it is vital for the study of psychological development to distinguish between the physiological state of nutritional need and awareness of this state (Bruch 1969). Halmi followed this by suggesting that the perception of hunger and satiety is a mechanism that allows the integration of an individual's cognitive set with his / her internal physiology to produce eating behaviour (Halmi 1995).

3.3.1. Physiological models

To start with the physiological state, humans as well as animals not only need to regulate their food intake according to daily energy requirements but also to maintain a reasonable long-term body weight. According to Logue's widely read textbook most theories of hunger have been based on the concept of homeostasis through negative feedback (Logue 1991). These feedback signals could either be sent from sensory endings in peripheral organs (peripheral theory) or originate in the brain itself (central theory).

Especially in the early years before much was known about the central nervous system the peripheral theory had many supporters, which is understandable given that for most people a growling stomach is synonymous with hunger. Washburn's investigation of the stomach contraction theory of hunger in 1912 was one of the first

experimental studies of hunger (see Logue 1991). It involved his subjects having a small tube inserted down their oesophagus, which was connected to a partially inflated balloon in the stomach and the pressure measured during contractions. However, later medical advances have proven that this theory is seriously flawed, as neither stomach contractions nor a stomach itself are necessary to experience hunger. Other peripheral theories of hunger involved stomach distension and oral stimulation. Experiments with sham fed animals (animals who had an oesophagostomy and consequently no stomach stimulation) demonstrated that oral factors contribute to the termination of eating but are not sufficient to regulate food intake on their own. On the other hand stomach distension, unless in a very extreme form, had little to do with the ending of an eating bout as experiments with intragastric feeding showed. Besides stomach and oral factors other peripheral factors like environmental temperature, the level of sugar in the blood (glucostatic theory), gut peptides and lipostatic mechanisms (see Webb 1995; Logue 1991) have been put forward. The number of theories and factors that have been found to influence food intake are a reflection on the complexity of the feeding system.

Since the early part of this century the brain has been implicated as controlling feeding patterns in man and animal. In 1901 a now famous case of obesity in a boy with a large tumour of the pituitary gland was reported (see Bruch 1969). Given the close anatomical and physiological links between the pituitary and the hypothalamus it seemed more than likely that the hypothalamus was involved in the regulation of eating. Clinical observations in humans and lesion experiments with animals have demonstrated that bilateral lesions in the ventromedial hypothalamus (VMH) led to hyperphagia and obesity whereas bilateral lesions of the lateral hypothalamus (LH) led to aphagia. Based on these findings the 'dual centre' hypothesis was developed (Stellar 1954), which proposed that food intake is regulated by two interacting hypothalamic centres, namely a satiety centre in the VMH and a hunger centre in the LH (Rolls & Rolls 1983). This theory dominated until the mid 1970s when it became evident that it was insufficient to fully explain food intake; the theory is based on animal experiments, didn't include the role of neurotransmitters and completely

neglected external factors and the role of learning. For a detailed review of the criticisms refer to Rolls & Rolls (Rolls & Rolls 1983) and Logue (Logue 1991).

Much of the work in researching food intake in humans has been done by investigating reasons for obesity. In this context one cannot fail to mention Schachter's externality theory of obesity, which was so influential that it can be found in most contemporary introductory psychological textbooks. In contrast to previous theories, which were mainly based on animal studies, Schachter's emphasis was on human eating behaviours (Schachter 1968; Schachter, et al. 1968). In a number of cleverly designed experiments he compared the food intake of obese and normal weight individuals without them being usually aware of the actual purpose of the study. For example, subjects were told that they would receive either extremely painful or hardly noticeable electric shocks and they were then left with a bowl of crackers which they had to rate for palatability. The normal weight subjects consumed significantly less crackers in the high fear condition than in the low fear one, whereas obese subjects ate the same amount in both conditions. In terms of Schachter's theory the obese subjects didn't respond to internal cues (assuming that fear inhibits gastric motility) whereas the normal weight ones did (Wright 1987). Further evidence that obese subjects didn't respond to internal physiological signals was found when subjects received so-called preloads, which affected the subsequent food intake of normal weight but not of obese subjects. In contrast to this, external cues like time of day, taste and visibility of food as well as how easy it is to obtain food affected the food intake of the obese to a much higher degree that the normal weight subjects (Wright 1987). Although Schachter's theory was based on the importance of external stimuli it had a very strong physiological foundation. Because of the similarities Schachter found between the eating behaviour of obese humans and that of rats with VMH lesions he concluded that obesity is related to the hypothalamus, a conclusion which provoked similar criticisms to the dual centre theory.

In recent years research into hunger and satiety has taken a more integrative, interdisciplinary approach. Blundell suggested that biological and environmental forces influence eating behaviour (Blundell 1995). He conceptualised appetite as a bio-behavioural system working on three interacting levels. The first level represented psychological events like hunger perception, cravings, and hedonic sensations as well as behavioural operations (food intake). The second level consisted of peripheral physiology and metabolic events and the third level included neurotransmitters and metabolic interactions. Satiety on the other hand refers to the inhibition of hunger and further eating which arises as a consequence of cognitive, post-digestive and post-absorptive processes following eating.

3.3.2. The role of cognitions

If the previous models of hunger or food intake regulation had a physiological foundation the following models stress the importance of psychological factors. However emphasis on factors like experience and learning doesn't imply that internal physiological aspects are not important in the regulation of human food intake. In fact Maus & Pudel argued that the regulation of food intake is an innate mechanism with neonates being almost entirely controlled by physiological needs and only with increasing age do psychological needs and external influences become more important (Maus & Pudel 1988).

There are few experimental studies concerning to what extent babies can regulate their food intake in response to internal cues. Part of the reason for the lack in those studies surely lies in the difficulty of how to assess hunger in infants. Methods usually used with adults are physiological and physical measures (salivation rate, stomach contractions, etc.), numerous questionnaires measuring subjective hunger, global hunger, fullness and food selection as well as behavioural measures (how much do subjects eat etc.) (Wardle 1987). Clearly there are ethical considerations, which limit the use of physiological and physical measures as well as practical problems like infants are not able to fill in questionnaires. Consequently behavioural measures are most commonly used although this is not without problems.

It is almost impossible to measure infants food intake ad libitum because firstly babies are dependent on the co-operation of their carers and secondly on the ability of carers to recognise hunger signals as such. Wright argued in his study with breast feeding mothers that they were not particularly accurate in estimating their infants hunger intensity and particularly mothers of male babies didn't notice hunger variations during the day (Wright 1987). Wright and colleagues undertook a number of studies about the early eating / feeding patterns, which have been introduced in section 3.2.1. In summary, they found that in regard to food intake regulation learning, takes place at a very young age. While meal-size is initially a reaction to periods of deprivation (like night time) by the age of six months breast fed infants appear to anticipate this deprivation and adjust meal-size accordingly, in other words experience and learning have altered eating patterns.

For infants and children the energy density of the food consumed is an important determinant of meal-size, which means eating smaller amounts of food, which is high in energy density and larger amounts of food, which is less energy dense. Animal studies have indicated that rats can adjust food intake in response to caloric density changes in their diets, so that a relatively constant level of intake was sustained (Birch & Deysher 1986). In a similar study with infants who received formulas of varying caloric density the authors observed that caloric intake was positively correlated with the caloric density of the formula until about six weeks of age (Fomon, et al. 1975). In other words, the infants were consuming the same amount of milk regardless of its caloric density. After that the infants began to show signs of caloric compensation, namely those infants receiving low-density formula consumed a larger amount of milk than those who received high-density formula. These findings can be interpreted in different ways; either an innate mechanism matures at about six weeks of age, or learning occurred due to the repeated experiences with the formulas.

Birch and colleagues carried out extensive research in the field of childhood eating behaviours. In a number of experiments they investigated whether the size of

children's meals was influenced by the energy density of the foods eaten; firstly within a single meal and secondly over a longer period of time (Birch & Deysher 1986). To assess the food regulation within a meal, children were given a fixed volume of a pre-load either high or low in energy density. Following the pre-load a second course was offered and the children were allowed to eat ad libitum. The food consumed in the second course was carefully measured and analysed for its nutrient composition. The studies showed that children showed caloric compensation, they adjusted their food intake in response to the energy density of the pre-load (for a summary see Birch & Fischer 1995)

Of course, for a successful regulation of food intake an organism must not only respond to energy density within a meal but over a longer period of time. In this context Davis classic experiment on dietary self-selection is of interest because the participating infants were not only able to choose what, but also how much, they wanted to eat (Davis 1928) (the study will be presented in more detail in section 3.4). The infants succeeded in achieving and maintaining apparently an exceptionally good state of health, which led Davis to the suggestion of the existence of some innate, automatic mechanism of which appetite is a part. Davis study has been heavily criticised but remains of at least historical interest.

More recently Birch et al. (Birch, et al. 1991) measured the food intake of 2 to 5 year old children over a number of days (Birch & Marlin 1982). They measured the energy content of every meal consumed as well as the energy total for each 24-hour period. Analysis of these data revealed a high variation of energy intake between individual meals but a relatively constant daily energy intake. Similar results were obtained when the fat content of the food offered was altered. Again the authors found evidence for adjustments in intake across successive meals with small meals followed by large ones and vice versa. But how does this mechanism work? - After all, meals are often terminated before post-digestive cues, which signal satiety, have a chance to develop. Birch argued that children are able form associations between familiar foods and the physiological consequences of eating them, which allows

them to adjust their intake in anticipation (Birch 1990). In a series of studies investigating this conditioning process Birch and colleagues gave children repeated experiences with high and low energy-dense versions of foods (for a review see Birch & Fischer 1995). For each child each pre-load density was always paired with the same flavour (for example high density vanilla yoghurt versus low density almond flavour yoghurt). In the test situation the yoghurts/preloads were actually of identical energy density but paired with either flavour and it was measured how much the child consumed of the ad libitum second course. The studies demonstrated that children continued to eat more after the flavour, which had been previously paired with low density. The authors interpreted this finding as an indication that the children learned to associate food cues with physical consequences.

The studies presented so far are evidence that children are able to respond to (and to anticipate) internal cues of satiety but they neglect the fact that outside the laboratory eating usually occurs in a social context, which might influence food intake regulation. Further research by Birch and colleagues examined to what extent social context influences children's responses to internal cues resulting from caloric density differences (Birch 1990). The design of the study was identical to the ones described in the conditioned satiety experiments, except that the children were told by adults to focus a) on internal cues of hunger or b) on external cues like time of the day and how much was left on their plates. In the second condition the children were also rewarded for eating. The results revealed that children who focused on internal cues showed clear evidence of adjusting their food intake in response to energy density. In contrast children who were told to focus on external cues showed no evidence of caloric compensation even after the social context was removed.

Johnson & Birch found that parents who reported using more control in their child-feeding practices had children who showed less responsiveness to caloric density (Johnson & Birch 1994). Additionally children who failed to adjust their energy intake in response to alterations in caloric density had greater body fat stores, a relationship that was particularly clear for girls. Interestingly, sex differences were

also found in other areas. Whereas mothers who restrained their own intake were also more controlling with their daughters eating behaviour, mothers of boys did not impose their own dietary restraints on their sons. Overall it could be shown that boys were better in adjusting their energy intake. The authors argued that cultural pressures increasingly produce a compulsion towards thinness particularly for females. Furthermore this study indicated that even as early as pre-school age, sex differences in the control of food intake are present which might foster the high incidence of dieting and restraint eating among females. In the context of my own research it would be interesting to know to what extent the participating children were aware of the effects their parents eating styles had on them and secondly if these effects could be still found when the subjects reach adulthood.

As described above, conditioning influences the maintenance and termination of eating and it seems likely that in our society where food is readily available learning also plays a part in meal initiation. Weingarten's experiments demonstrated that the initiation of meals could be conditioned in rats (Weingarten 1984). Even when they were sated they started to eat when an external cue was presented which had been previously paired with food presentation. His experiments inspired Birch and colleagues to undertake a similar study with pre-school children (Birch, et al. 1989). During the training phase they repeatedly gave children snacks in the presence of visual and auditory cues whereas on subsequent days different cues were presented in the absence of food. The authors found that even when the children had recently consumed a meal (and thereby were unlikely to experience any energy depletion signals) they were more likely to start eating in the presence of cues that had been previously associated with eating than in the presence of those that had not. Age influenced this outcome with older children being more likely to correctly identify the association between external cues and the presence of food, and conditioning was consequently more likely to take place.

In summary the studies presented above substantiated that even very young children are able to self-regulate their food intake in response to varying energy density of the

food offered. But the findings also emphasised the importance of learning processes, which soon begin to play a central part and can override basic biological tendencies. Even babies were able to adjust meals size in anticipation of periods of food deprivation and pre-school children showed evidence of conditioned satiety and conditioned meal initiation. It seems that social context of feeding/eating is essential for the regulation of food intake. Parents often worry if their child eats too much or too little and they therefore employ external control strategies in the feeding situation. Unfortunately the research seems to indicate that this often has effects contrary to those intended because it might impair the child's ability to recognise and respond to internal cues of hunger and satiety. Already at pre-school age, sex differences in this area can be found and Birch and colleagues argued persuasively that this finding helps to explain why eating problems have such a high incidence among females.

With increasing age the question of how much to eat appears to become more complex and less influenced by internal signals. Birch & Deysher compared young children and adults with regard to caloric compensation and sensory specific satiety (Birch & Deysher 1986). They found that both adults' and children's preferences for the food they had just consumed declined in comparison to foods they had not recently eaten. The authors interpreted this as a sign of sensory specific satiety. Maybe more interestingly they could demonstrate that children showed much clearer evidence for caloric compensation than adults did. The authors hypothesised that children have fewer experiences with food and consequently less expectations, they might therefore be more responsive to physiological feedback cues that may be immediately available to signal satiety.

On the subject of sensory specific satiety, Rolls and colleagues undertook a number of studies with adult subjects (Rolls, et al. 1981). They found that subjects ate a third more when they were offered four different kinds of sandwiches in succession instead of only one kind. This effect was repeated in another study where three yoghurts with distinctive flavours, colours and textures were offered. An increase in

consumption could be observed in comparison to when only one yoghurt was offered, even though it was the subject's favourite flavour. However, an increase in intake could not be observed when the yoghurts did not vary profoundly. Based on the above findings it seems likely that satiety is at least partly specific to a food, which has been consumed and that consequently the availability of a wide range of foods can lead to increased food intake during a meal. The authors proposed that these findings are an important clue to the high incidence of obesity in Western societies, which pride themselves on the wide variety of foods available.

From everyday experience it seems convincing that food intake is not only influenced by the variety of food available, but also how palatable it is. The relationship between hunger and palatability has been investigated by using tracking ratings (Hill, et al. 1984). Normal-weight women were asked on two occasions to eat small equicaloric lunches consisting of either highly or less preferred foods. The subjects had to fill in a number of questionnaires in fixed intervals, measuring prospective consumption, bodily sensations and general feelings, food preferences and fullness. As expected, the authors found that hunger diminished during the course of eating and feelings of fullness rose correspondingly. During eating hunger was influenced by the palatability of food, but the desire to eat (i.e. appetite) was influenced to a much higher degree. In contrast to that, ratings of fullness (i.e. satiety) were hardly influenced at all by the factor of how much a person liked the food. The study also revealed after-effects of eating highly preferred foods namely that such food might hasten the return of feelings of hunger and the desire to eat. The authors suggested to view hunger rating as an index generated by a variety of sources like internal state (reflected in physical sensations), palatability, and attributions made about the caloric value of the foods consumed.

Suzan Wooley was among the first to investigate the sensitivity of humans to the actual and informed energy content of a preload (Wooley 1972). Her study design involved four experimental conditions, which varied the actual energy content (high vs. low) and the information given to the subjects (true vs. false) about the energy

content. The studies demonstrated that the reported feelings of hunger were to a higher degree influenced by the subjects' beliefs than by the actual energy content of the preloads consumed. The authors suggested that relative insensitivity to internal signals of caloric loads was the norm for people of any weight level. In comparison to Birch's studies with children, it seems that children posses the ability to regulate their food intake in response to internal cues but that adults loose this ability and are more influenced by cognition. However, the methodology of Wooley's study has been criticised (Ogden & Wardle 1990). The main criticism was that the subjects were allocated to the groups post hoc with respect to their guesses about what they had consumed. Given that these guesses were made after the subjective hunger ratings it seems likely that those two variables were related. Wardle found, in subsequent studies (which manipulated subjective and physiological factors independently), that adults were after all sensitive to actual energy content. However Wooley's studies remain influential and were relevant for the model of restraint eating. Restrained eating behaviour can be described as a cognitive attempt to consciously limit one's food intake, an eating pattern that is particularly common among women (Wardle & Beales 1986). Numerous studies indicated a relationship between restrained eating and episodes of binge eating (Spencer & Fremouw 1979) and most researchers would argue that this relationship is a causal one.

These studies are based on 'set-point' theory, which proposed that every person has specific set-points of body weight that are determined by biological and individual factors (Nisbett 1972). If a person tries to achieve or maintain a weight below her/his set-point this individual would be biologically underweight. Restrained eaters (like any human or animal, which endures energy depletion) experience acute and chronic hunger and are therefore more responsive to external cues associated with food and eating. Polivy modified this theory by emphasising the importance of cognition and emotions for the short-term regulation of food intake, stating that cognitions are more important than internal physiological signals (Polivy 1976).

Amongst many others Herman & Mack tested this hypothesis in a laboratory situation (Herman & Mack 1975). In the first phase of the experiment subjects had to consume a set number of milkshakes (one, two, or none) whereas in the second phase they were allowed to eat as much ice-cream as they wanted. The subjects had also filled in a questionnaire about eating behaviour, which classified them as normal, or restraint eaters. Unlike normal eaters, restraint eaters demonstrated so called counter-regulation by eating more after a large preload and less after a small or no preload. Later experiments revealed that the mere belief of having overeaten (by consuming a large preload) could trigger binge eating. Polivy & Herman argued that restrained eaters substitute internal homeostatic control with cognitive control and that this makes them more vulnerable to bouts of excessive eating because they are used to ignoring their physiological state (Polivy & Herman 1985). However, reviews of dietary restraint concluded that counter-regulation was found in normal weight restrained eaters but that obese restrained eaters simply failed to regulate food intake (Ruderman 1986). Williams and colleagues looked at the relationship between the three constructs critical for the restrained eating theory (cognitive restraint, disinhibition, and hunger) in a large sample of female and male adolescents (Williams, et al. 1996). They found firstly that there were two types of restraint eaters with some youngsters who followed the prediction of the dietary restraint theory and binged, while others maintained their restraint. Second, they found that bingers were not a homogeneous group and displayed varying levels of cognitive restraint. Finally, hunger seemed to be 'multi-determined', which means in this context that non-dieters experienced only little hunger because they ate before they got too hungry and dieters might not experience much hunger either because they successfully suppressed it. I think the results are best summarised by part of the paper's title "dieters are not always bingers, and bingers are not always dieters".

As discussed above, there is evidence to suggest that children are born with a system to self-regulate food intake (at least to a certain degree). It seems that learning and cognitions very soon alter or even undermine this system. Social context plays an important part in this, be it through parental control strategies in the feeding process

or due to pressure from a society which values thinness in women to such an extent that they feel the need to constantly limit their food intake.

3.3.3. Hunger and satiety in eating disorders

In the above sections physiological and psychological approaches to hunger and satiety in children and adults were introduced. The following section will investigate the relationship between eating disorders and hunger / satiety. Halmi integrated several models of hunger by summarising that the "perception of hunger and satiety is the mechanism that integrates an individual's cognitive set (attitudes toward, and the conceptual identity of, the nutritional content of the food) with her / his internal physiology (neurotransmitters, peptide hormones, metabolism affecting the intake of food) to produce eating behaviour" (Halmi 1995, p.247). Looking at the self-starvation of anorexics or large binges of bulimics it seems reasonable to suspect that in the case of eating disorders this perception is disturbed.

Based on her clinical work with obese and anorexic youngsters, Bruch (Bruch 1974) argued that hunger was not innate biological knowledge (Bruch 1969). Starting with the moment of birth every human has to learn how to organise hunger signals into recognisable patterns. She paid particular attention to early mother-child interaction in the feeding situation, proposing that if the mother responded adequately to signals indicating nutritional needs the infant would develop an engram of hunger. If, on the other hand, the mother responded inappropriately, was neglectful or over-solicitous, the child would be confused and later not be able to discriminate between hunger and other sources of discomfort. In her opinion, eating disorders were the result of these incorrect learning experiences and reflected the individual's inability to respond to bodily sensations. As an example of this she referred to the common statement of anorexics 'I do not need to eat' and claimed that this is an accurate report of how they feel. To underpin her theoretical deductions from clinical observations she carried out an experiment in which measured amounts of food were introduced into the stomach of obese, anorexic and normal weight subjects in order to compare their sensitivity to internal stimuli (Coddington & Bruch 1970). Although the ability to

recognise if and how much food they had received varied within the normal weight group, obese and anorexic subjects were significantly less accurate.

Comparing anorexic and normal weight women using hunger and satiety questionnaires before and after a meal demonstrated that both groups perceived hunger in a similar way (namely as a feeling of gastric emptiness) but that for anorexics the experience of hunger was connected with negative effects like an increased urge to eat, preoccupation with food and anxiety (Garfinkel 1974). The groups varied more in regards to the perception of satiety where, unlike the controls, anorexics described either no gastric sensations or feelings of being bloated. Additionally the majority of anorexic subjects did not eat until they felt full but instead restricted their intake to a predetermined limit. The author noted that the 'abnormal' perception of satiety remained even two years after maintaining a reasonable weight. In a later experiment the same group confirmed the differences elicited in responses to a satiety questionnaire (Garfinkel, et al. 1978). As another method to measure interoception the authors used a modified version of a Cabanac testing method. This method was developed to demonstrate that obese subjects did not show any changes in ratings of the pleasantness of a sucrose taste following a glucose preload. In contrast, normal controls experienced satiety or an aversion to the taste after glucose preloading (Cabanac & Duclaux 1970). Similar to obese subjects, anorexics displayed no satiety aversion to sucrose which indicates a lower than normal responsiveness to internal cues related to food requirements.

Clinical observations of bulimics supported the notion that they too have difficulties experiencing fullness and satiety after a meal, which contributes to difficulties in food intake regulation. A previous study employed a six-meal protocol to assess satiety in binge and non-bingeing eating episodes in bulimic and normal eating women (Hadigan, et al. 1992). They assessed satiety by examining whether an increase in the size of a preload led to a decrease in food consumption in a subsequent test meal. To summarise the results, bulimics failed to develop consistent changes in hunger and satiety ratings in response to preloads of varying sizes. In the

bingeing condition bulimics ate significantly more than controls and also found it difficult to complete the non-bingeing meals without inducing vomiting afterwards. Even though these findings suggest a disturbance in satiation in bulimics, the bulimics showed some form of responding to internal signals by significantly reducing their food intake after a large preload in comparison to a small one.

The previous section included a description of the first study utilising the methodology of tracking hunger and satiety ratings before, during and after a meal (Hill, et al. 1984). This method has been employed to compare the hunger perceptions of anorexics of different subtypes and normal weight women (Owen, et al. 1985). The curves generated showed marked differences not only between eating disordered and normal women but also between subgroups of eating disorders. The study was a pilot study and involved only a very small number of subjects, but the same design was used in an expanded study to include three eating disorder subgroups (anorectic-restrictors, anorectic-bulimics, normal weight bulimics) a control group and overall a larger number of participants (Halmi & Sunday 1991). The experiment involved the consumption of liquid meals under two conditions, in one a reservoir of food was visible, in the other it was hidden. Somewhat surprisingly the external cue of being able to see how much was consumed did not significantly influence the consumption. Analysis of the ratings came to the result that (just as in the pilot study) eating disordered subjects had predominantly 'abnormal' patterns of hunger and satiety curves, indicating a confusion of these concepts.

A normal pattern was characterised by being hungry before a meal, eating reduced hunger and increased fullness and that fullness was maintained in the post meal session. In contrast to this pattern, restricting anorexics displayed high fullness and low hunger ratings throughout the test session whereas bulimics typically reported that they were hungry and not full throughout the course of the meal. Those bulimics who did experience hunger reduction frequently experienced rebounds of hunger shortly after the end of a meal. The above hunger and satiety aberrations persisted for 6 to 12 months after the end of treatment (Halmi 1995). The study also elicited

differences in post meal cognitions, particularly those connected with the urge to eat. The urge to eat was negatively correlated with satisfaction (restricting anorexics had the least urge to eat and were most satisfied with the meal) and was also associated with binge frequency and depression (bulimic patients who binged frequently were most likely to be depressed).

The role of serotonin in the development and maintenance of eating disorders has been investigated. It is now well established that drugs which increase serotonin levels depress the urge to eat and can cause nausea, for example selective serotonin re-uptake inhibitor anti-depressants (McManis & Talley 1997). Similarly, drugs that block certain actions of serotonin are used as anti-emetics (Goldspiel, et al. 1997). Some authors have argued that anorexia might reflect a mild hyperserotonergic state and that bingeing might be an adaptive behaviour to regulate a physiological deficit of serotonin in the brain (Kaye 1995; Pirke 1995). Brain levels of serotonin are known to be dependent on the availability of tryptophan, which adds support to this theory.

The above studies used liquid formula meals so that the proportions of nutrients could not influence the perception of hunger and satiety. But Sunday & Halmi wanted to investigate the response of eating disordered subjects to normal foods of varying levels of fat and carbohydrates (Sunday & Halmi 1996). Microanalysis of the meal as well as the analysis of hunger and satiety ratings came to similar results as the studies described above. A macro analysis of the meal showed that eating disordered subjects demonstrated more variability in their total energy intake than did the controls. This finding reflected the fact that the eating disordered patients showed either severe restriction or overeating. Fat content of the food did influence eating behaviour particularly in bulimic subjects. If they succeeded in limiting their initial fat intake they were able to keep their energy intake below that of the control group. If, on the other hand, they did not manage to control their initial fat intake they generally overate. The authors further showed that perceived high levels of fat

not only triggered strong feelings of guilt and danger in eating disordered patients but also in restraint eating controls.

Reviewing the literature it seems that eating disorders are not only characterised by a disturbed eating behaviour but also by an 'abnormal' perception of hunger and satiety. Although some of these features (for example a lack of satiety aversion to sucrose) were shared by different subtypes of eating disorders, more detailed assessments indicated patterns that were specific to each subtype. The finding of a disturbed integration of the processes of perceiving hunger and satiety does not answer the question of causality, in other words it is still unclear if those abnormal perceptions are the cause or the result of disordered eating. All studies that assessed their eating disordered subjects at various times during and after treatment agreed, that disturbed perceptions of hunger and fullness remained for some time after treatment, even if eating behaviour appeared to have normalised. Research in the area of hunger and satiety perception is of direct relevance to the treatment of eating disorders. This has been stressed in the past by Hilde Bruch and more recently by authors like Sunday & Halmi, who argue that the treatment of anorexic and bulimic patients should involve a 'retraining' of normal hunger and satiety responses (Sunday & Halmi 1996).

3.4. Food selection

The introduction of solid food is often the first time period in life that is associated with eating problems. It is therefore a critical time for children and their parents, and for many a constant battle. There is, of course, the question of how children would fare if they could choose their own food without being bribed, charmed, ordered or pleaded with. Davis' original classic experiment supported the idea of 'body wisdom' but has since been widely criticised (Davis 1928). Some food preferences and aversions are genetically based, but most are acquired when individuals are exposed to novel foods. As discussed in the previous chapters, food and eating are an important part of our existence as social beings. Learning what to eat is therefore shaped by social constraints and by observing significant others like parents and peers.

3.4.1. Biological determinants

Newborn babies seem to have an innate preference for liquid foods and they are usually not willing to accept any solid foods before they are 10 weeks old (Lyman 1989). A finding that is not surprising given that the first source of nutrition - mother's milk or a facsimile of it - they are likely to encounter is liquid. However, in the context of this study consistency is of lesser importance than taste. Taste is basically a chemical sense, which operates by detecting molecules of chemical substances. Humans have four basic taste sensations, namely sweet, sour, bitter and salty. Taste receptors are situated on the tongue and not only convey pleasant sensations but also help in preventing any undesirable or even toxic elements from reaching the stomach.

Although taste and hedonic quality are closely associated with food acceptance and refusal, genetic aspects and heritability are seldom included in food selection studies. Studies on neonates allow examining the existence of genetic factors because at that age preferences are unlikely to be learned responses. Facial expressions of infants in response to different taste stimuli have shown that even newborn babies have distinct unlearned responses (Steiner 1979). Facial responses to bitter and salty tastes expressed disgust but are also adaptive mechanisms because they involved mouth movements that tended to eject the unpalatable items. A great deal of evidence suggests that infants (as well as animals) have a strong preference for sweet tastes (Birch 1987). It has been argued that it was of evolutionary advantage to have a preference for a concentrated source of calories, like sugar, when digestible calories are not freely or sufficiently available (Logue 1991). Furthermore sweet was usually associated with 'safe' given that many poisons have a bitter taste. The evidence regarding an innate reaction to salt is less clear (Schmidt & Beauchamp 1990). At about four months of age babies start to prefer isotonic salt solutions to water or a near isotonic salt solution (Beauchamp, et al. 1986). The authors interpreted this finding as evidence for a post-natal maturation of an unlearned preference. Another model for studying genetic factors lies in twin studies. Such studies have demonstrated a strong heritability for the sensitivity in detecting the bitter taste of phenylthiocarbamide (PTC), but in terms of preference and use of 24 food items a

heritability component was only found in 8 and 3 of the food items respectively (Krondl, et al. 1983). Based on these findings it seems that environmental adaptation and learning have a stronger influence on food related behaviour of adults than a genetic component.

If we accept that humans have a number of innate adaptive responses towards food, the question arises how far this 'wisdom of the body' reaches. Clara Davis' classic studies (Davis 1939) addressed this particular question (Davis 1928). All in all 15 infants who had no previous experience with adult food were allowed to self-select their diets. At each meal the children were presented with a variety of natural, unprocessed and unpurified foods of which they could choose what and how much they wanted to eat. As a result of her six-year study Davis found that the children were in exceptionally good health and without any eating problems. Although some of the chosen combinations might appear strange to us they were nevertheless well balanced from a dietetic point of view. Also the quantities consumed reflected calorie intake in relation to changing energy requirements connected with growth and increased activity. Davis concluded: "...by providing conditions under which appetite could function freely and beneficently as in animals and primitive peoples, the experiments resolved the modern conflict between appetite and nutritional requirements. It eliminated anorexia and the eating problems that are the plague of feeding by the dosage method." (Davis 1939, p.261)

Her study has been criticised for making fairly broad statements based on such a small sample. Furthermore the children were living in an institution under the care of nurses and other health professional, which is likely to have a beneficial affect on their general status of health. The main criticism is probably that the children weren't completely free in their choice of food. After all they were only presented with a selection of healthy foods. But Birch put this criticism in perspective by pointing out that Davis herself recommended "... leave the selection of foods to be made available to young children in the hand of their elders, where everybody has always known it belongs." (Birch 1987). Consequently, she viewed Davis' study more as an

illustration of social transmission (whereby an individual transmits cultural rules to the child) than as evidence for the wisdom of the body. However more recent support for the latter model has been reported (Schmidt & Beauchamp 1990). They referred, for example, to clinical observations in patients with Addison's disease (with an inability to retain salt due to hormone deficiency) who exhibit an increased preference for salt and consume large amounts of it.

In summary, infants are born with a number of adaptive mechanisms in regard to food. Some, like the preference for sweet, can be observed from birth onwards others are innate but seem to mature later. Although there is evidence to support the notion of the wisdom of the body (in other words that a person prefers to eat what his/her body needs) food choice cannot be totally guided by genetic and biological determinants. After all, it would not be adaptive for a species in a constantly changing environment to have a rigid set of preferences which limits food choice and thereby survival.

3.4.2. Social determinants of food selection

Apart from a few genetically programmed responses, humans are born without information about what is edible and what isn't. They need to learn to make this distinction during infancy. Humans are omnivores and as such need to find and consume a wide variety of foods. Some studies have suggested that there might be a sensitive period during the middle of the first year of life where babies were particularly open to the introduction of novel foods (Drewett, et al. 1998). This suggestion is supported by Davis' study with newly weaned infants. She described that the babies "...tried not only the food but chewed hopefully on the clean spoon, dishes, the edge of the tray, or a piece of paper on it. Their faces showed expressions of surprise, followed by pleasure, indifference, or dislike (...) Never again did any child eat so many foods as in the first weeks of the experimental period" (Davis 1939, pp.260-261).

As any parent or caretaker of small children knows, children at this age see almost anything as potential food and there is hardly anything that isn't tempting enough to

be put into the mouth, chewed on or even to be swallowed. With the end of the first year this phase usually comes to an end and the child becomes less flexible in its eating pattern and more wary of new foods. From an evolutionary viewpoint this behaviour might be of advantage because at this stage of development the child becomes more mobile and independent and could be endangered by eating potentially dangerous food he encounters. The noted food psychologist Paul Rozin emphasized this neophobia, or fear of the new, to describe an unwillingness or rejection of novel foods (Rozin, et al. 1986). On the other hand neophilia, or love of the new, describes a desire or willingness to seek out new, different food resources.

When we are exposed to new foods a basic pattern of eat, evaluate, repeat consumption or rejection takes place. Research with humans and other omnivores has shown that food preferences are shaped through the repeated association of sensory cues with the social contexts and physiological consequences. Future rejection is particularly likely when the consumption of a novel food is followed by gastro-intestinal illness, in other words when a conditional food aversion has occurred. As de Silva & Rachman demonstrated, these aversions were robust over time, associated with considerable avoidance behaviours and resistant to cognitive persuasion (De Silva & Rachman 1987). However actual physical sickness is not essential for the rejection of food, as food is often rejected before even tasted. Rozin & Vollmecke identified three principal reasons for rejecting foods (Rozin & Vollmecke 1986):

1) **Danger**, food is rejected because of anticipated post ingestion consequences like allergic reactions, vomiting, etc.
2) **Distaste**, food is rejected of the smell or taste.
3) **Disgust**, food is rejected because of the origin or nature of the food. Either items are rejected because they are culturally considered inappropriate (e.g. paper) or offensive (e.g. faeces, insects).

In a study of 1 to 5 year olds, very young children were shown to be likely to accept dangerous or disgusting substances, but that older children increasingly rejected these substances (Rozin, et al. 1986). However for all of the age group studied inappropriate foods were still likely to be consumed. This result supported the conception of the development of food choice that moves from broad to narrow and Rozin summed up his findings with the statement "... a major part of learning that occurs in development might be a learning what *not* to eat." (Rozin, et al. 1986, p. 141). These findings were somewhat at odds with those by Wright who found in a similar age group that the older children were more likely to taste unfamiliar fruits, which indicated a decreasing neophobia (Wright 1991). What both authors did agree on was that learning plays as important part in food acceptance and that this process is highly influenced by social context.

In Birch's experiments exposure and familiarity emerged as significant factors for food preferences in young children. Unfortunately, and in contrast to dietary guidelines, the most familiar and preferred foods in childhood tend to combine the principle components sugar and fat (Birch & Fischer 1997; Birch 1992). Parents and nutritionists alike are faced with the problem of how to introduce different foods as children often reject novel food and therefore can't achieve familiarity. Their attitude can be summarised with the refrain 'I don't like it; I've never tried it' (Birch & Marlin 1982).

Birch & Marlin found that visual exposure alone had an influence on familiarity ratings, but further experiments underlined that to achieve significant changes in food preference the children had to taste the food and not just look at it (Birch & Marlin 1982; Birch, et al. 1987). This finding supported the 'learned safety' hypothesis, namely that ingestion of novel foods that is not followed by negative gastrointestinal consequences will be regarded as safe and therefore will be chosen again. Furthermore the study has direct implications for health education as it demonstrated that just talking about healthy eating or showing pictures of fruits and vegetables is not sufficient to achieve behavioural changes. Recent school

intervention programs to reduce risk factors for obesity (Sahota, et al. 2001) therefore not only involved teacher training, school action plans to promote healthy eating and physical activity, but also the actual modification of school meals.

Unlike in a laboratory setting, children's eating is typically a social occasion and the presence of parents, siblings, peers etc. allow other learning mechanisms to take place. Modelling is one of those mechanisms and especially effective when the model is seen as similar to the observer or if the model is regarded as particularly powerful. Birch examined the effects of peer models food choices on preschool children (Birch 1990). In her study she seated a child with strong preferences for one particular vegetable with three or four children who showed preferences for another vegetable. The author found that within four days the target child showed a significant shift from choosing their preferred vegetable to the preferred vegetable of their peers. This shift was still evident several weeks later and Birch argued that preschoolers' food preferences were strongly influenced by those of other children.

In their review of factors influencing children's eating patterns Ray & Klesges stated that children were more likely to eat what they see an adult eating (Ray & Klesges 1993). Furthermore the relationship to this adult seemed to be of importance with mothers being more influential than strangers. Of course, if a child's preferences are to a significant extent shaped by those of their parents this raises the issue of what impact paternal dieting practices or eating disorders have on their offspring. This issue will be discussed in greater detail in chapter 4. At this point it is sufficient to say that studies have shown that maternal dieting or eating pattern can constitute a risk factor for their daughters to develop similar patterns and that modelling might in effect play a role in the transmission of eating behaviours.

One area that utilises the effects of modelling and familiarity is television and in particular advertising. The average child watches 24 hours of television per week and is therefore exposed to hundreds of commercials. Millions of pounds spent on advertising not only familiarise potential customers with a product but also foster

favourable attitudes towards them. Despite its profound role in today's society relatively few studies have examined the effect of television on children's food choices and the existing ones were almost exclusively based on American television. However, with the advent of cable TV, satellite dishes etc, the findings can to some extent be generalised for Britain too. One survey showed children viewed on average 21.3 commercials per hour and food advertising accounted for 47.8% of these commercials (Taras & Gage 1995). A staggering 91% of advertised foods were for items considered to be of low nutritional value like candies, high sugar breakfast cereals, biscuits and soft drinks. Those commercials influenced not only the food preferences but also the behaviour of children, with children wanting to buy those foods most often advertised (Ray & Klesges 1993). Simply seeing some kind of food advertised increased the liking for that food and this was especially the case if the advertised foods were associated with positive role models (Rodin 1980).

The final learning mechanism that will be discussed within this section is instrumental learning or specifically the role of food as a reward. Many types of food are given as reward or withheld as punishment, with sweets being the most frequently used in either role (Ray & Klesges 1993). One study indicated that this was a common practice employed by half the parents of preschool children (Stanek, et al. 1990). Sweets and desserts were most often used in an attempt to manipulate the child's behaviour. If food is used as reward the social context is positive and the presentation of the food is typically associated with parental attention and praise. Birch and colleagues carried out a number of studies investigating the influence of social context on children's food preferences. For example, they presented children with food in different social contexts where it was used either as a reward, paired with positive adult attention or in a non-social control condition (Birch, et al. 1980). After a series of 20 presentations the children's preferences for the food used in positive social context were significantly increased (with the reward condition resulting in the biggest shifts) whereas there was no change in preferences in the control condition. On the other hand, food can be presented in more negative social context namely the child has to eat a certain food to obtain a reward. A common example for that would be the parent rule that the child has to eat the vegetables to

get the dessert. In a subsequent study, the same group found that children's preference for a fruit drink declined if the children were made to drink the juice in order to be allowed to engage in a play activity (Birch, et al. 1984). Many parents would like their children to consume more vegetables and fruits and less fatty or sweet food, however restricting foods tends to enhance the food preferences and can increase intake (Birch & Fischer 1995). In addition the same authors pointed out that dichotomising foods into 'good' and 'bad' foods might send mixed messages to children who observe that those bad foods are offered as treats or for special occasions (Birch & Fischer 1998).

In summary although humans are born with some innate food preferences what we choose to eat is determined by a variety of factors. Young children have to learn which things are safe to eat and what they like. Exposure and familiarity play an important part in the establishment of early food preferences whereby the actual ingestion of the novel food is not essential but of great importance to create familiarity. Eating within the family has a profound influence on food selection as family members serve as models and also provide the social context in which the food is presented. Experiments by Birch and colleagues have indicated that the instrumental use of food can have opposite effects to those desired. Commonly used parental practices (restrictions, treats, etc) might reinforce the preference for foods high in sugar and fat and the rejection of food that is 'good for you.

4. Early risk factors for the development of disordered eating

The previous chapter explored how children learn to eat and what mechanisms might play a role in the acquisition of food preferences and eating patterns. The following chapter will examine eating behaviours 'gone wrong' and investigate possible causes or risk factors for the development of disordered eating.

The present study aimed to explore links between early eating patterns and later eating disorders - accordingly the following chapter will focus on risk factors, which were present at an early stage of life. Parents are usually the ones providing food and play an important part in the development of a child's eating habits. Furthermore eating disorders are widely attributed to particular family structures or interactions (Bruch 1973; Minuchin, et al. 1978). The first section of this chapter will present those theories and empirical evidence related to them. The second section will discuss the impact of genetic influences on the development of pathological eating behaviours. Any manifestation of such behaviours at a young age can only be due to early causative factors. Consequently, current research about childhood eating problems will be presented. Given the existing social stigma of obesity it is not surprising that dieting has become increasingly common even among young children. The last section of this chapter will therefore explore dieting behaviour and its links with the development of eating disorders.

4.1. Family Characteristics

At a young age the family is arguably one of the main influences and as a result has been the focus of attention for clinicians and eating disorder researchers alike. Bruch stressed the importance of mother-infant interaction for the development of hunger awareness and subsequent eating patterns (Bruch 1973) (see chapter 3). Based on her work with obese and anorexic children she formed her theories around 'family frames and transactions'. Within these family frames she described the features of a family with an obese or anorexic child. For example, she observed that obese children often had a particular position within their families (e.g. the youngest) and a mother who felt insecure in her fundamental attitude towards the child. Bruch argued that the

mother compensated for this with overfeeding. Additionally families of obese children often regarded physical activities and social contact with peers as dangerous and undesirable, which set the scene for later inactivity and poor social adjustment. On the other hand, typical families of anorexic children were described as success-oriented upper-middle class families, which encouraged their child's academic or athletic development but did not promote self-expression and autonomy.

Minuchin also based his theories on clinical work with anorexics (Minuchin, et al. 1978). Like Bruch, he associated family relationships and rearing practices to the development of eating disorders. He postulated that 'certain types of family organization are closely related to the development and maintenance of psychosomatic syndromes in children, and that the child's symptoms in turn play an important role in maintaining the family homeostasis. Anorexia nervosa is defined not only by the behaviour of one family member, but also by the inter-relationship of all family members' (Minuchin, et al. 1978, p.20-21). Based on this model he referred not to families with anorexic children but to anorexic families and he observed four features, which characterised those families.

1. **Enmeshment:** Enmeshment refers to an extreme form of proximity and intensity of family interactions. The anorexic family is characterised by highly enmeshed patterns, which promote loyalty and protection of the family, but work against autonomy and self-realisation. Family members intrude into each other's thoughts and feelings and their excessive togetherness results in a lack of privacy for the individual family member.

2. **Overprotection:** This is reflected in a high degree of concern for each other's welfare. Nurturing and protective responses are constantly elicited and supplied. The parents' over protectiveness retards the development of autonomy, competence and interests in activities outside the safety of the family.

3. **Rigidity:** The anorexic family is heavily committed to maintaining the status quo. In periods when change and growth are necessary they consequently experience great difficulty.

4. **Lack of conflict resolution:** This describes the denial of existing problems and the families are highly invested in consensus and harmony. If a conflict does arise the families are typified by an inability to confront differences or to negotiate resolutions.

Another prominent advocate of this systemic view is Palazzoli who described families with anorexic children as rigid homeostatic systems, regulated by secret rules, which pathologically bind the family together (Palazzoli 1974). Most of the above theories were based on clinical work with anorexics and their families as bulimia nervosa has only been defined as a syndrome in its own right in the 1980's.

Since then, these theories have been expanded to include and describe bulimic families as well. Vandereycken summarised that the anorexic family seemed to be more 'consensus-sensitive' whereas the bulimic families seemed to be more' distance-sensitive' (Vandereycken 1995). In contrast, the bulimic family showed less conflict avoidance and stronger interpersonal boundaries but provided a less stable and less caring environment overall.

These theories proved very influential and have stimulated a great deal of research. The following sections will present some of these studies concerning the basic question 'what are the families of eating disordered individuals like?'

4.1.1. Demographic Features

Over recent years the image of anorexia and bulimia as disorders of the white, upper-middle classes has been challenged and this section aims to provide a brief overview of the conflicting findings. As most researchers themselves point out reported characteristics of eating disordered families are difficult to compare as a variety of different measures and different populations have been used.

4.1.1.1. Socio-economic status (SES)

Even in 1880 Fenwick observed that anorexia nervosa was more commonly found in the 'wealthier classes of society than those who have to produce their bread by daily labour' (Silverman 1992). Since then it has become one of the stereotypical features attributed to anorexia nervosa. Bruch detected among her anorexic patients a majority of upper-middle class and even 'super-rich' families (Bruch 1974). More recently this stereotype has been questioned the overrepresentation of upper social classes could be associated with the structures, norms, and thresholds of the local health care systems (Hoek 1995). In countries like the Netherlands, with a rather generous state health insurance system, social economic status seems to have less of an influence on the presentation and recognition of eating disorders. Freeman & Gard set out to further dismantle the myth that eating disorders are associated with higher socio-economic status by reviewing the existing literature (Gard & Freeman 1996). They concluded that the relationship between anorexia nervosa and high socio-economic status was not proven, but due to artefacts in the data collection and interpretation. Furthermore they found increasing evidence that if there is relationship between bulimia nervosa and socio-economic status, it points towards a predominance of cases in lower socio-economic groups.

In contrast to anorexia and bulimia, the finding of a strong negative correlation between social economic status and obesity is striking in its consistency in all epidemiological studies undertaken in the Western developed societies. Pervasive stigmatisation of obese individuals has been reported as a potential cause of this correlation (Sobal & Stunkard 1989). One large study on men and women in Manhattan compared overweight men and women with normal weight men and

women with regard to their social status and achievements (Goldblatt, et al. 1965). They found that being thin was associated with a higher social class for women but not for men. The authors also discovered that in comparison with normal weight women, overweight women were much less likely to achieve a higher socio-economic status than their parents and were in fact more likely to achieve a lower status. A further recent longitudinal study with Australian families investigated the association between BMI and family characteristics, including life style, in parents and their offspring (Burke, et al. 2001). Their data confirmed the association between lower SES and overweight or obesity in the parents but in that study the only significant correlation between BMI and SES in the offspring was seen at age 12 in daughters. This study will be discussed in more detail in section 4.2.2.

4.1.1.2. Ethnic background

Whereas epidemiological studies dating from the 1970's claimed that anorexia nervosa was virtually limited to patients of white racial origin, more recently reviews of clinical populations have gradually recognized the existence of different levels of eating pathology among different ethnic groups (McCourt & Waller 1994). In particular, girls with an Indian subcontinent heritage living in Britain have been shown to have increased levels of eating pathology, which the authors link to high levels of perceived maternal control. An interesting observation by Bryant-Waugh & Lask was that in their original studies of childhood onset anorexia in the late 80's none of their patients were of Asian origin (Bryant-Waugh & Lask 1991). However, over the subsequent few years 13% of referrals for anorexic girls were of Asian origin. It is plausible that minority non-white groups who live in Western societies are in a juxtaposition of different norms and values. This additional stress factor might contribute to the development of bulimia or anorexia.

As discussed above, obesity is associated with lower socio economic status, which in turn is linked with ethnic origin. However, in comparison to other race-sex groups white women experienced the greatest pressure to be slim, they were least likely to be overweight and obesity amongst white women was most strongly associated with lower social class status (Rand & Kuldau 1990).

4.1.1.3. Family size and birth order

Vandereycken & Van Vreckem reviewed the divergent results of studies concerning family size and birth order (Vandereycken & Van Vreckem 1992). In contrast to Bruch (Bruch 1974) they could not find conclusive evidence that any of these variables had a significant association with anorexia or bulimia nervosa. But Vandereycken conceded that these findings did not exclude the possibility that for individual cases their position within the family might be of relevance for the development of an eating disorder (Vandereycken 1995).

4.1.1.4. Family psychiatric morbidity

Studies investigating the prevalence of psychiatric disorders amongst bulimic and anorexic subjects have been undertaken to clarify possible causal and ontological links. The lifetime rates of particular diagnoses like mood disorders are significantly higher in relatives of subjects with eating disorders than in relatives of control subjects drawn at random from a general population (Strober 1995). An earlier study compared bulimic patients, patients with a major depressive illness and non-psychiatric control subjects (Hudson, et al. 1987). They found that the risk for a major affective disorder amongst first-degree relatives of bulimic and depressive subjects was similar (32% vs. 24.6%) and significantly higher than that of the normal controls (9%). Similarly anorexia has been linked with high levels of affective disorders, alcoholism and substance abuse in relatives (Santanaso, et al. 1997; Strober 1995; Lilienfeld, et al. 1998). More recently comparison studies between various groups of subjects with eating disorders have been undertaken. While no significant differences in the distribution of psychiatric family histories between anorexic and bulimic subjects has been found, a further subdivision of patients showed that the presence of purging behaviour was associated with a higher incidence of a pathological family background (Pantano, et al. 1997). Another study came to similar conclusions, but also noted that a positive family psychiatric history was associated with more serious eating pathology, and that therefore family psychiatric morbidity could be of prognostic value (Santanaso, et al. 1997).

Although most studies agree about the existence of an association between family psychiatric history and eating disorders it remains unclear if eating disorders and mood disorders are linked to a common liability that is familially transmitted.

4.1.2. Family Interactions

Since clinicians (Minuchin, et al. 1978; Palazzoli 1974) have stressed the importance of specific pathogenic family processes for the development and maintenance of eating disorders many investigators attempted to measure concepts like enmeshment, family interaction, cohesiveness or attachment in families with eating disorders (Bruch 1973).

Strober was one of the first to use a standardised scale -the Family Environment Scale (FES)- to compare two subtypes of anorexic subjects, namely restricting anorexics and bulimic anorexics (Strober 1981). The results of his comparison indicated that the families of restricting anorexics had higher levels of cohesiveness and a clearer structure of rules and responsibilities within the family. In contrast, the bulimic anorexic families had higher levels of conflict interactions and expressed more negativity. A later study used the FES to compare bulimic anorexic patients with controls without a history of psychiatric disorder (Humphrey 1986). In addition to these two groups, the parents of the subjects also completed the FES. The study found that the bulimic anorexic patients perceived their families as being more isolated, less involved and less organised than the controls. Maybe an even more interesting finding was that mothers and fathers rated their families in a very similar way as their daughters.

Johnson & Flach used somewhat different populations by comparing bulimic patients with normal controls (Johnson & Flach 1985). They found that their bulimic patients were similar to Strober's bulimic anorexic group. In comparison to normal controls, the bulimic women perceived their families as less supportive and reported that their families did not encourage independence. The authors encapsulated the findings by saying that these families seem to be enmeshed yet disengaged, with high conflict and a low emphasis on self-expression. Families of bulimics had

achievement expectations comparable to those of control families but the former placed less emphasis on intellectual and recreational activities. Interestingly they found that a greater disorganisation of the family resulted in greater severity of bulimic symptoms. One comparison study of four eating disordered sub-groups (bulimic anorexics, restricting anorexics, bulimics and controls) and their parents revealed significant differences between the families in the same direction as found in the previous studies (Stern, et al. 1989). Although both eating disordered subjects and their parents rated their families as being less supportive, less encouraging of the expression of feelings and more conflictual, the authors found a consistent tendency for the parents of all groups to view their families in a more positive light than their daughters.

The above studies have concentrated on female patients with different forms of eating disorders. Kagan & Squires were interested in the relationships between eating behaviours of normal college students and their perceptions of their family's cohesion and adaptability (Kagan & Squires 1985). They found no relation between those family characteristics and dieting, and a gender specific relationship for compulsive eating. Male compulsive eaters perceived their families as relatively uncohesive and rigid whereas female compulsive eating was only associated with uncohesiveness. In summary, subjects who dieted restrictively or binged did not share the family pattern associated with clinical eating disorders.

Another self-report measure commonly used to assess family interaction is the Parental Bonding Instrument (PBI) (Parker, et al. 1979), which was also used in the present study. The PBI was developed in Australia and has been used extensively in a number of studies with subjects suffering from different psychiatric disorders. It has two sub-scales measuring Care and Overprotection. The latter subscale is obviously particularly relevant to test Minuchin's theories of overprotection within anorectic families. Results of studies using the PBI to assess families with eating disorders have been somewhat ambiguous (Ward, et al. 2000).

In a non-clinical population overprotection as well as low care was associated with abnormal eating attitudes (Calam & Slade 1987). However, these findings were not replicated in a study with eating disordered patients (Palmer, et al. 1988). They compared the PBI scores of bulimic and anorexic women with those from the published normative data of Australian GP's and found no significant differences on the overprotection scores and only small and inconsistent differences on perceived care. The authors stressed that overall the clinical subjects produced widely varied results and therefore concluded that family factors were of importance but that eating disordered patients were diverse and had a widely variable experience of family life. This study was criticised for using the Australian norms as a comparison for a British population given that national or cultural differences are likely to be reflected in PBI scores. This criticism was addressed by a subsequent study using a relatively large British population of 98 patients with bulimia or anorexia and 242 comparison subjects (Calam, et al. 1990). On the whole, the authors found support for the hypothesis that eating disorders were associated with less parental care and more protection. Although the mothers of the eating disordered women were perceived to be more overprotective this difference did not prove to be significant. In contrast, fathers were perceived as significantly more overprotective. This trend for paternal overprotection was also found in an American population of bulimic women but it was the lower level of perceived care (particularly from the mothers), which clearly distinguished bulimics and normal controls (Pole, et al. 1988).

As pointed out above, the results of the self-rating measures might be influenced by a variety of factors unrelated to the question of whether eating disordered families are indeed different from those without the occurrence of an eating disorder. The Palmer et al. (Palmer, et al. 1988) study was criticised for using Australian norms despite findings that the PBI is culturally sensitive. Age is another factor of possible influence. Calam et al.'s study found significant correlations between the women's ages and the PBI scales, with older women remembering their parents as being more protective and less caring (Calam, et al. 1990). A comparison study of adolescent patients with anorexia nervosa reported that the anorexic patients rated their parents similarly to a normal control group and as more caring and less overprotective than a

non-eating disordered patient group, who were referred for other psychological problems (Russell, et al. 1992). The authors raise issues concerning the use of the PBI in adolescents - particularly anorexics who might have the tendency to idealise their parents - and the role of the family in the aetiogenesis of this condition. Another possible confounding factor is the existence of other psychiatric disorders like depression. Pole et al. addressed the problem that eating disorders are frequently associated with depression and that depressive symptomatology could influence the perception of parenting (Pole, et al. 1988). However in their study depression was not related to a more negative perception of the parents. In contrast, Blouin et al. found that only the FES scores of depressed bulimics reflected the picture of less cohesive, less independent and more achievement oriented families, but non-depressed bulimic women did not differ from normal controls (Blouin, et al. 1990). In summary a number of factors might contribute to conflicting findings as the discussed studies employed different instruments, different age groups, and confounding factors like depression or the desire to portray a perfect family have not always been taken into account (Ward, et al. 2000).

Although there is extensive literature on families of patients with eating disorders, little is known about their siblings. Studies of eating disorders in siblings have used mainly twin studies to establish a possible influence of genetic factors for the development of anorexia and bulimia nervosa. One study of the lifetime prevalence of eating disorders in siblings of anorexic patients compared with siblings of patients with other psychiatric disorders (Strober, et al. 1990). The authors came to the conclusion that first-degree relatives of anorexic patients were significantly more likely to develop an eating disorder than all other groups. Still, with prevalence rates about 6.1% for either anorexia or bulimia nervosa the number of affected sisters was quite low. One could argue that this result is not supportive of aetiological theories stressing the importance of family factors given that certain styles of child-rearing should be similar for siblings of the same sex. On the other hand, some authors stressed the importance of non-shared experiences (Wonderlich, et al. 1994). Their study looked at the non-shared childhood environment in bulimia nervosa. In comparison with normal controls, bulimic women were more likely to perceive their

father as less affectionate and more controlling towards them than their sibling. This finding suggested that although siblings grew up in the same family environment critical factors were not shared. Unfortunately the study did not use siblings as controls to assess their perspective of family life.

One study that did actually involve siblings was by Caspar (Casper 1990). His long-term follow-up study compared anorexic women, their sisters closest in age and normal controls, with a variety of measurements. No differences in body weight, EAT scores, and all eating related sub-scales of the EDI between recovered anorexics and their sisters were found. The sister pairs scored higher on the same sub-scales and demonstrated more body dissatisfaction and drive for thinness than the normal controls. The three groups also completed personality questionnaires that showed that the scores of the non- eating disordered sister were between those of the anorexic sisters and those of the normal controls. The authors argued that the sister pairs shared their endorsement of conventional standards and were equally authority bound but that the non-eating disordered sisters possessed greater spontaneity and a greater ability towards effective social engagement.

Reviews of the research in this area have deduced that is too fragmentary and sparse to conclude whether siblings are more at an increased risk for developing an eating disorder themselves (Vandereycken & Van Vreckem 1992). So far, studies have focused on problems of sib-ship but overlooked the positive role siblings can play in the protection and/or recovery from eating disorders.

4.1.3. Maternal eating disorder and its influence on the children

Traditionally anorexia and bulimia have been seen as disorders concerning mainly adolescents and young adults. More recently this approach has been expanded to childhood eating disorders and the recognition that many eating disordered women have children themselves. The following section will only briefly discuss the effect of eating disorders on fertility and pregnancy. Instead the main focus will lie on the

relationship between maternal eating behaviour or attitudes and the eating pattern of their offspring.

Studies of anorexic women have demonstrated that an active eating pathology was associated with a lower birth weight of the infant (Treasure & Russell 1988), as well as lower Apgar scores (Stewart, et al. 1987), which indicated that the babies of eating disordered mothers were, at birth, less alert and in poorer physical condition. The incidence of prematurity was twice, and perinatal death was three times higher than within a normal population (Brinch, et al. 1988). There are fewer studies about normal weight bulimic women although profound amenorrhoea (usually seen in anorexic women) is relatively rare; consequently pregnancies among women with bulimia nervosa are not uncommon. These studies noted variable effects of the pregnancy on the eating disorder pathology. In their descriptive study of pregnancy and motherhood in anorexic and bulimic women Dent & Freeman claimed that pregnancy had either an ameliorating or deleterious impact on those conditions rather than no effect (Dent & Freeman 1994). Lacey and Smith indicated considerably reduced symptoms with 75% of the bulimic women in their sample having stopped their bulimic behaviour by the third trimester (Lacey & Smith 1987). However, they also reported a higher incidence of obstetrical complications and congenital malformations. On the other hand, a later study found no significant differences between the first pregnancies of bulimic and normal controls in regards to miscarriages, pregnancy complications or birth weight (Mitchell, et al. 1991). Nevertheless, the authors conclude that hospital admission for actively bulimic patients was advisable if they couldn't control their eating on an outpatient basis.

Obesity also negatively affects menstrual functions and fertility (Foreyt & Poston 1998). Additionally, obesity is associated with an increased risk of miscarriage as well as maternal and foetal complications (Pettigrew & Hamilton-Fairley 1997). A study exploring the relationship between maternal obesity and psychological well being during pregnancy and postpartum was recently (Carter, et al. 2000). The authors found a significant association between BMI, eating attitudes and anxiety/

depressive symptoms at 4 and 14 months postpartum, but this relationship did not exist during the pregnancy. These findings are consistent with an earlier study which found that women who were obese before their pregnancy were more likely to have a positive change in body image during their pregnancy, whereas women who were of normal weight were more likely to have a negative change (Fox & Yamaguchi 1997). It can be argued that for bulimics pregnancy provided a socially accepted or even venerated reason to be larger and thereby a break from the cultural ideal of slimness (Lacey & Smith 1987). It seems plausible that the same mechanism could apply for obese women.

If eating disorders are regarded as someone's inability to control and regulate their food intake adequately, then this leads to the question of how they respond to someone else's nutritional needs, mainly of course their own children. Additionally, the possibility has been raised that the maternal eating pathology might interfere with satisfactory parenting and the overall mother-infant relationship (Hodes, et al. 1997; Woodside & Shekter-Wolfson 1990).

Studies in regards to early feeding (Stewart, et al. 1987; Stein & Fairburn 1989) found that women with active anorexia or bulimia had more difficulties breast-feeding. Lacey & Smith described that the overall nutritional and developmental state of infants of bulimic mothers was good although 15% reported 'slimming their babies down' within the first year of life (Lacey & Smith 1987). Equally Evans & le Grange found that eating disorders affected early feeding behaviours with eating disordered women being more likely to schedule feed their babies whereas normal comparison mothers were more likely to feed their infants on demand (Evans & le Grange 1995). However their results also indicated that mothers and children of both groups did not differ in their satisfaction with their body sizes and the accuracy of their body perception. An interview reported that in each of the cases the mother's eating pattern affected the way she cared for the child (Stein & Fairburn 1989). Either the quality of parenting was directly affected by bingeing or purging activities,

or by an unwarranted concern about the weight and shape of their children resulting in attempts to keep the child's weight down.

Prolonged malnourishment of their children has been also observed in anorexic mothers. A study by van Wezel-Meijler & Wit described three mothers who had brought their children to medical attention because of their worries that the children were growth retarded. Only after closer examination did it become clear that the mothers had been anorexic and indeed severely limited the food intake of their offspring (Van Wezel-Meijler & Wit 1989). More recently, one case series presented a collection of eight anorexic mothers whose children had suffered food deprivation as a consequence of their mothers' eating disorder resulting in shortness of statue, physical frailty and psychological harm (Russell & Treasure 1998). The study revealed different methods adopted by the mothers to limit their children's food intake including prolonging breast feeding, diluting bottle feeds and forbidding snacks or sweets.

Probably the most comprehensive series of studies investigating the impact of maternal eating disorder on early care taking and infant development were conducted by Stein and colleagues. They observed primiparous mothers of infants with eating disorders and those without during meals and in playtime (Stein, et al. 1994). The authors detected that, compared with controls, the eating disordered mothers were more intrusive towards their children in both situations and also expressed more negative emotions during meals. The index mothers were more reluctant to let their child feed him/herself and overall mealtimes were more often characterised by conflicts. The index children themselves weighed less than the control children and their weight was inversely related to both the amount of conflict during meals and the extent of mother's concern about her own body shape. To examine if this finding was specific to infants of mothers with eating disorders or common in infants of mothers with any form of psychopathology a second parallel study was undertaken (Stein, et al. 1996). In comparison with infants of mothers with post-natal depression the infants of eating disordered mothers were smaller, both in terms of weight for

length and weight for age. However the study found little evidence that eating disordered women were dissatisfied with the shape of their children or that they misperceived the size of their children. The authors concluded that the way in which maternal eating pathology affected a child's development is complex and that their finding did not support a direct transmission via the extension of the mother's psychopathology.

The above studies took eating disordered mothers and examined their children. An alternative strategy to investigate inter-generational transmission is to look at a population of children/adolescents and investigate what their mothers' attitudes towards food and eating are like.

Stein et al. compared the mothers of children with feeding disorders with mothers of children with other behavioural problems and community comparison mothers (Stein, et al. 1995). The mothers of the index children scored significantly higher on all subscales of the Eating Disorder Examination Questionnaire except concerns about body shape. The association between feeding problems and maternal eating disturbances was further strengthened by a recent community study (Whelan & Cooper 2000). After screening for feeding and other behavioural problems, four year olds were divided into three groups (children with feeding problems, children with behavioural problems and children without problems) and their mothers were assessed with standardised psychiatric interviews. In comparison with the two other groups, the mothers of children with eating disorders did not differ in regards to past and present affective disorder but the incidence of eating disorders was dramatically raised.

Not only infants, who are most dependent on their mothers' care and feeding, are influenced by maternal eating disorders or disturbances but the same pattern has been found amongst preadolescent and adolescent girls. Using the EDI, one study identified high school girls with a high level of eating disturbances and compared their mothers with those of girls with a low level of eating disturbances (Pike &

Rodin 1991). As anticipated, the mothers of the girls with eating disturbances were more eating disordered themselves than the mothers of the comparison group. Furthermore the former reported a longer history of dieting, thought their daughters should loose more weight and rated their daughters as less attractive than the girls judged themselves. They were also less satisfied with family cohesion (relative to ideal) than the comparison mothers. Hill & Franklin's study sought to further investigate these concepts in British 10-year-old girls and their mothers (Hill & Franklin 1998). In contrast to Pike and Rodin's study, they found that mothers' and girls' dietary restraint scores were correlated, but their eating attitudes were not. However, mothers of high restraint girls did rate their daughters' attractiveness significantly lower than the other mothers and also reported less family cohesion, organisation, and moral-religious emphasis. The authors of both studies interpreted their findings as a further indication that maternal eating patterns and attitudes have an impact on their offspring's eating patterns. However both studies couldn't provide evidence regarding the specific mechanism of intergenerational transmission, as they didn't allow discrimination between modelling influences and the more direct parental encouragement to control weight. But as Hill & Franklin pointed out, it would be plausible to assume that parents both indirectly and directly influence their daughters' eating given the high value placed on thinness and weight control (Hill & Franklin 1998).

Stein (Stein 1995) suggested three possible groups of mechanisms by which parental eating disorders may influence a child's development:

1. The disturbed attitudes of the parents have a direct effect on their offspring (e.g. underfeeding, being critical about their child's eating habits or their child's shape).
2. The eating pathology interferes with general parenting functions (e.g. parental preoccupation with food may impair their ability to respond to their child's other needs).
3. Parents with eating disorders present a poor role model.

In summary, studies concerning intergenerational transmission of eating disorders have consistently demonstrated that maternal eating disorder has an impact on their children. This impact can range from prolonged underfeeding of infants resulting in failure to thrive, feeding problems in early childhood and a disturbed eating pattern in young girls. The results were consistent, no matter whether the index group consisted of mothers with a diagnosis of eating disorders or of children with some form of disturbed eating pattern. Although the evidence for the existence of intergenerational transmission is considerable, the precise mechanism remains unclear and it seems likely that different methods of transmission are not mutually exclusive but constitute a complex system.

4.2. Early onset eating problems

The present study is concerned with the association of childhood experiences related to food and eating and later eating disorders. Lask argued that eating disorders develop over time with some causative factors being in place from birth, others emerge early in life and finally others which occur much later in life (Lask 2000). Early manifestations of eating disorders therefore indicate those risk factors that are present at a young age. Furthermore, particularly in the case of obesity, the longer a child has had problematic eating behaviours the less likely it is that the problem will spontaneously resolve. For these reasons the following sections will give an overview of research regarding early eating and feeding problems as well as childhood onset of obesity, anorexia and bulimia.

4.2.1. Early eating and feeding problems

The previous sections explored how eating patterns in infancy and childhood are established in general. In addition, the following section will concentrate on problems related to early eating or feeding patterns and possible links to the development of eating disorders in later life. Particularly in the first year of life feeding is an important part of the parent-child interaction and often described as a mirror of the parent-child interaction overall. One definition stated that feeding is successful when the parent attends to the child's rhythm and signals of hunger and satiety, works to calm the child and develops feeding mechanisms that are effective

with the individual child's emotional needs, feeding skills and limitations (Satter 1988). This current section will present data relating to less successful or satisfying feeding relationships.

Some researchers have differentiated between malnutrition and failure to thrive on one side (Lindberg, et al. 1990) and early feeding problems on the other side, whereby the former diagnosis is based on growth disturbances and the latter diagnosis is solely made on the basis of feeding processes. This classification has been criticised as being oversimplifying as both areas can overlap, for example in the case of young children who developed serious behavioural eating problems after experiencing ill health or tube feeding in early life (Douglas & Bryon 1996). For the purpose of this review, failure to thrive will therefore be included. It is a problem which normally concerns and alerts parents and one of the main reasons why children are brought to medical attention. As discussed above, this syndrome is also of particular relevance for eating disorders research as it was observed in children of anorexic mothers.

Given the importance of feeding and the time and energy which is required, it is not surprising that parents are experiencing a great deal of concern about their children's eating patterns. But although feeding problems are common there are surprisingly few studies about routine feeding problems within a normal population (Dahl & Sundelin 1986). One epidemiological study in Sweden found that 1.4% of infants aged 3 to 12 months had required referral for feeding-related problems, whereby the majority of these cases belonged to the categories colic, vomiting, and refusal to eat (Dahl, et al. 1986). Undoubtedly the number of children with problematic eating behaviours, which does not warrant further medical attention, was considerably higher. Another review of eating problems within childhood and adolescents reported that at least 25% to 40% of young children displayed eating patterns, which concerned their parents (Maloney & Ruedisueli 1993).

The types of feeding problem seen change according to the child's development. In the first few months of life colic, spitting up, sucking and weaning problems dominate. In contrast the toddler years are more likely to be characterised by an increasing independence of the child that finds its manifestation in food battles. Food refusal, dawdling over meals and in particular picky eating are most commonly described with the latter occurring in up to 30% of children (Maloney & Ruedisueli 1993).

In an attempt to identify aetiological factors in the development of early eating problems a variety of aspects have been investigated. Many authors have underlined the importance of responsiveness in the feeding interaction (Satter 1988; Ainsworth & Bell 1969; Bruch 1973). Examples of parental mistakes were terminating feeding at pauses instead of continuing the feeding process or misinterpreting the baby's fussiness as satiety. Satter made a causal link by stating that such parental behaviours were likely to produce underweight infants. What is more, problems in the feeding interaction seem to have an impact on the overall parent-child relationship and vice versa, for example one study which assessed infants with non-organic failure to thrive and found that 50% of them showed insecure attachment to their mothers whereas this was only in 16% of the control group the case (Gordon & Jameson 1979). A more recent study came to similar results by comparing toddlers with infantile anorexia nervosa, picky eaters and healthy eaters (Chatoor, et al. 1998). The infantile anorexic group exhibited the highest rate of insecure attachment relationships and the authors concluded that feeding problems could occur with secure child-parent relationships but that insecure attachment might intensify feeding problems and might lead to more severe malnutrition.

One large study of 1408 infants between 30 and 71 weeks looked at risk factors for different types of eating problems within a normal population (Lindberg, et al. 1990). They found that 25% of the parents experienced some feeding problems in the first six months after birth and that for more than 10% this was an ongoing problem. While vomiting was only related to breast-feeding problems, the authors found that

colic was additionally related to maternal health factors, caesarean section and problematic mealtime behaviours even after the colic had disappeared. Refusal to eat presented the largest number of correlates including problematic meal behaviours, family feeding problems and health problems. The factors which the eating problem groups had in common and which distinguished them from control groups, were sibling feeding problems and parental anxiety about infant health. However, it seems likely that the latter were more likely to be the result of early eating problems rather than a predictive factor. Still, the results of Lindbergh et al.'s study supported Dahl and Sundelin's (Dahl, et al. 1986) earlier findings that a substantially greater proportion of parents with infants with feeding problems had experienced feeding problems in their own childhood. Like in the above study Dahl & Sundelin described the refusal to eat group as having the most overt difficulties in the mother child interaction with the children tending to eat slowly with many interruptions while their mothers were trying to tempt, distract or even force the child to eat.

Douglas & Bryon (Douglas & Bryon 1996) interviewed the parents of young children with severe behavioural feeding and eating difficulties and found that 76% of their patient group had been diagnosed with a least one severe medical problem in their early history (including Down syndrome, cancer, ophthalmic problems, etc.) and that they were commonly born prematurely and / or with a low birth weight. Within the group a higher proportion of developmental delay and of behavioural problems was found (in particularly sleeping problems) than would be expected in a normal urban population but this finding could be related to the presence of early medical problems. Distress during feeding in the first six months of life and frequent vomiting were other common findings in the histories of the children. Most parents felt that the feeding problem had a significant impact on their family life, but no raised levels of maternal depression or pathological eating attitudes could be found. In contrast to Lindberg et al. (Lindberg, et al. 1990) the parents didn't report a raised level of eating disturbances amongst their other children. Two further studies (Whelan & Cooper 2000) looked at the mothers of infants with feeding problems and found increased rates of eating disorders or disturbed eating patterns amongst them (Stein, et al. 1995).

As discussed above a wide variety of factors may be important in the aetiology of eating and feeding problems and as Skuse & Wolke stated 'feeding problems are particularly likely to develop when either the infants endogenous programming is faulty in some way, compromising the signals or the coherence of the pre-programmed behaviours, or when the caregiver is for some reason unable accurately to identify or respond to the infant's particular needs.' (Skuse & Wolke 1994, p. 2)

Early feeding and eating problems are of particular interest for research into eating disorders because of their shared characteristics. For the aetiology of early eating problems as well as later eating disorders the mother child interaction is regarded as of vital importance and family features are examined as potential risk factors. What's more, problems like refusal to eat and anorexia nervosa appear very similar in their manifestation and both can lead to severe physical problems. However, few empirical studies exist that have investigated the relationship between early eating problems and the later development of eating disorders. In one retrospective study, parents of bulimic women reported no significant feeding and eating problems in their daughter's childhood (Mitchell, et al. 1986). Whereas another found a raised incidence of reported feeding problems amongst the parents of pre-pubertal anorexic girls in comparison with post-pubertal anorexics and pre-pubertal neurotic children (Jacobs & Isaacs 1986). As far as this author is aware only one prospective study exists that has traced maladaptive eating pattern over a 10-year period from early childhood to late childhood/adolescence (Marchi & Cohen 1990). The authors found that children showing problems in early childhood are at an increased risk of later developing an eating disorder or at least eating disorder symptoms warranting concern. The frequency of symptoms and diagnoses increased with age and were more prevalent in girls than in boys. The study identified pica and problem meals in early childhood as risk factors and picky eating as a protective factor for bulimia nervosa. On the other hand, digestive problems and even more so early picky eating were strong risk factors for anorexia nervosa in adolescence.

However, it is difficult to infer a causal link between early eating problems and eating disorders because the former are so common and an association might therefore be coincidental (Machan & Waller 1993). The authors therefore set out to investigate one mechanism that potentially links the two phenomena, namely maternal response to food fussiness. To do so mothers of bulimic, anorexic and normal eating daughters were asked about their daughters fussiness as a child and what management strategies the mothers implemented to reduce this fussiness. The authors came to two main conclusions; firstly that mother's attempt to manage food fussiness with behavioural strategies had apparently the inadvertent effect of maintaining it, and secondly that those women who developed bulimia or anorexia were affected by the mothers' use of behaviour modification strategies at a younger age. The authors speculated that the mothers of eating disordered women exerted more global control and that the children responded from an early age with trying to re-establish some control over food.

The parental management of fussy eating was further investigated in a group of normal teenage girls and their mothers (Calam, et al. 1997). Like in the previous study, negative and positive reinforcement were found to be ineffective, while early use of modelling was associated with increased fussiness in later childhood. Additionally fussiness in childhood was correlated with bulimic attitudes and behaviours in adolescence. Both studies were pessimistic about early interventions for fussiness using behavioural techniques and argued that intervention should aim at improving the parent-child relationship and to provide the child with alternative means of attracting parental attention.

The studies presented above have focussed on those early feeding problems where parents are concerned that the child doesn't eat enough food or is very picky about what food is eaten. On the other hand, excessive or voracious appetite is a fairly uncommon complaint of parents (0.2%) despite the fact that 5 to 15% of children under 5 are obese (Maloney & Ruedisueli 1993). This is a somewhat surprising finding given the stigma attached to obesity, and might be interpreted as an

indication that for babies (unlike all other age groups) a certain 'pudginess' is socially acceptable or even desired. After all, unless severely overweight, bigger babies tend to reach developmental milestones like eating solids, crawling, or walking earlier. Furthermore a number of authors have stressed the feeding relationship is a reflection of the overall mother child relationship. On this base it seems plausible that a mother whose child doesn't eat feels rejected and perceives eating as a problem whereas a child's 'good appetite' is seen as a confirmation of a positive relationship.

4.2.2. Childhood obesity

Recent increases in childhood obesity have been reported and raised public concern with some suggesting an obesity 'epidemic' in young children (Dietz 2001). A study of a large number of 3 - 4 year old English children reported that there was a 60% increase in the prevalence of being overweight (defined as a BMI >85th percentile) and a 70% increase in the prevalence of obesity (BMI >95th percentile) between 1989 and 1998 (Bundred, et al. 2001). They found that the increase in weight was not mirrored by an increase in height, which must lead to the conclusion that obesity increased and not overall size. The authors also could not find increased rates of obesity in infants aged 1-3 months, consequently the excess weight gain occurred between infancy and preschool age. Other studies criticise the use of percentiles and refer to recently agreed cut-off points for overweight and obesity in children (Chinn & Rona 2001; Cole, et al. 2000). However, despite using different measures Chinn & Rona's study came to similar conclusions. The analysis of the BMI of primary school children showed a greater increase among the older groups, an outcome that was particularly noticeable in Scottish children (with nearly 20% of the 9 to 11 year old girls being overweight). In 1994, 1.7% of boys and 2.6% of girls in England fulfilled the criteria for obesity whereas in Scotland those rates were higher with 2.1% of the boys and 3.2% of girls being obese.

Similar increases in childhood prevalence rates have been found in the United States (Ogden, et al. 1997) and other developed countries around the world. Still, according to a recent review of 50 national surveys childhood obesity isn't a public health problem in the majority of developing countries with the lowest prevalence rates in

the poorest countries of Asia and in Sub-Sahara Africa (Martorell, et al. 2000). Overall childhood obesity was associated with living in urban regions and with a higher socio-economic status of the mother. The authors concluded that 'Nutrition Transition' (the adoption of Western diets with high levels of fat, sugar and refined food and a more sedative life style) hadn't had yet an impact of most children in developing countries.

4.2.2.1. Aetiology of obesity

These increased prevalence rates are of particular concern given that obesity in childhood is a good predictor for obesity in adulthood. Whitaker et al. (Whitaker, et al. 1997) found that being overweight in infancy (1 to 3 years of age) did not increase the risk of adult obesity but that thereafter the risk steadily increased regardless of parental weight. However parental obesity more than doubles the risk of developing adult obesity in obese and non-obese children under ten years of age. Lieberman (Lieberman 2000) reviewed studies concerning childhood obesity and found that between 40 and 74% of obese 11 to 14 year olds became obese young adults and that up to one third of obese adults had been at least overweight by the age of 7 and two-thirds by the age of 14.

To investigate the natural history and the concept of critical periods for the development of childhood obesity a number of longitudinal studies have been undertaken (Stark, et al. 1981; Burke, et al. 2001; Guo, et al. 2000). Stark et al followed 5362 British children born in one week in March 1946 and recorded their weight at age 6, 7, 11, 14, 20 and 26 (Stark, et al. 1981). The authors could not find an optimal age for the prediction of obesity but that excessive weight gain could commence at any time. Similarly to the above studies, they found that overweight children were more likely to become overweight adults than their normal weight contemporaries. Still another, more recently published, longitudinal study found evidence indicating the existence of critical periods for the development of obesity (Guo, et al. 2000). The authors concluded that changes in childhood BMI were related to adult weight and obesity for women in particular. They also detected that the pattern of BMI changes reflecting childhood obesity had stronger effects on

subsequent weight than birth weight and adult lifestyle variables like physical activity, smoking and alcohol.

4.2.2.2. Genetic factors

In regards to the aetiology of obesity the importance of genetic influences is widely accepted. At a population level the genetic component of obesity is usually expressed in terms of heritability, which can range between 0 and 1. Data from numerous studies suggest that BMI has a hereditability of 0.2 to 0.7 (Lieberman 2000; Grilo & Pogue-Guile 1991). However family aggregation studies do not differentiate between the effects of genetic transmission and shared environment. Adoption studies have found a strong correlation between the BMI of adopted children and their biological parents but not their adoptive parents. Also studies with adoptive siblings found little evidence of shared environmental influences as no significant correlations between those children who were brought up together could be found (Grilo & Pogue-Guile 1991). The study of monozygotic (MZ) twins reared apart is regarded as one of the most effective designs to study genetic components but is difficult to carry out for practical reasons. Nevertheless one study managed to find a larger number of MZ (n=186) and dizygotic (DZ) (n=218) twins who were reared apart and compared their BMI with that of twins who were reared together (Stunkard, et al. 1990). The authors demonstrated an overwhelming influence of genetic factors with heritability values (0.7 for men and 0.66 for women) for MZ twins who were reared apart. Sharing the same family environment did not contribute to the similarity of BMI in later life but non-shared experiences contributed 30% of the variance. But in the face of dramatically rising prevalence rates of obesity environmental influences must be included. Increased rates of assortative mating among obese individuals might contribute to the rise of obesity via genetic factors (Hebebrand, et al. 2000), but it seems unlikely that this phenomena alone leads to rapid changes within the gene pool (Sorensen & Echwald 2001).

Although the importance of genetic influences has been established, the link between genotype and phenotype remains unclear. A number of candidate genes have been identified which could be implicated in determining phenotype. Animal models of

obesity have been investigated in an attempt to locate single gene defects that have the potential to cause obesity (for a recent review see Chagnon, et al. 2000). No single human gene for obesity has yet been identified as a result of these models and many argue that multiple gene loci are likely to be implicated. However rodent research has advanced our understanding of human obesity and of particular current interest are mutations of the LEP and LEPR gene, which are responsible for the production of the hormone leptin and its receptor. In mice, injections of leptin led to reductions of body weight, subcutaneous fat, serum glucose and insulin. Relative insensitivity of leptin receptors has also been hypothesised as a possible cause of obesity (see Jebb 1997 for a review). Investigation of these animal models may yet bear more fruit as the equivalent human genes have been found and are similar.

4.2.2.3. Environmental Factors

In the following sections the relevance of different environmental factors for the development of childhood obesity will be presented. Although peers and the broader world play a role in a child's development, particularly at a young age the family is probably the main influencing factor. Many variables within the family environment may influence a child's eating pattern and thereby its weight. Amongst others parents influence their children's eating by child-feeding strategies, family life style and food offered and consumed in the family.

Bruch's work about the relationship between childhood obesity and early feeding experiences has been presented earlier (Bruch 1973). The basis of this theory was the observation that mothers of obese children found it difficult to distinguish between emotional and hunger signals from the child. This observation has been empirically supported by a study of a small group of mothers with early onset morbidly obese children and a comparison group (Baldaro, et al. 1996). Mothers and children of both groups were asked to identify facial expressions of emotions (anger, sadness, fear, happiness) shown on slides. Support for Bruch's observations was found as the mothers and children of the experimental group made more mistakes in the recognition of facial expressions. Furthermore they found a linear correlation between the number of mistakes made by the mothers and by their children.

Dietary intake is certainly one environmental factor, which has been implicated in the development of obesity. From an early stage onwards parents use a variety of strategies aiming at providing an adequate, well-balanced diet. As described in chapter 3 the use of bribes, threats, and food rewards by parents can be counterproductive (Birch & Fischer 1998). For example, the number of parental prompts and encouragements to eat has been shown to be directly related to the relative weight of the child and longer feeding times were associated with a higher weight of the child (Klesges, et al. 1986).

The issue of control in the feeding situation has been further examined, especially in regards to parents' own dieting attitudes. According to one study, the type and degree of parental control used in the feeding situation was critical for the development of obesity in children (Costanzo & Woody 1984). They concluded that parents are especially controlling in areas of their children's development, which are of particular importance to themselves, or in which they perceive their children to be at risk. This was consistent with the finding that children with greater body fat stores showed less evidence of responsiveness to caloric density cues and were in turn more likely to have mothers using high levels of control in the feeding situation (Johnson & Birch 1994). What's more, the authors found some indication that mothers who cognitively control their own food intake were especially controlling in the feeding practices of their daughters but mothers of sons did not impose the same dietary restraints. A later study by the same group further substantiated the significance of control in the feeding relationship by providing evidence that mothers' dietary restraint and perceptions of their daughters' risk of being overweight predicted maternal child-feeding practices which in turn predicted their daughters' eating and relative weight (Birch & Fischer 1998). This was partially replicated by a discordant sibling study with mothers of obese and non-obese children that emphasised the importance of mothers' own eating history and weight concerns, but could not find differences in the maternal control over feeding between the obese and non-obese child (Saelens, et al. 2000).

The eating pattern of the parents has not only been examined in the context of parental control in the feeding situation but also in its own right as a likely source of influence on a child's dietary intake. Agras et al. examined the microstructures of eating behaviour and caloric intake in parents and their 18 months old infants by observing them eating a lunch in a laboratory setting (Agras, et al. 1988). They found that even if separated for the meal the infants' caloric intake was significantly correlated with mothers eating rapidly and fathers' duration of eating. However their study did not find a significant relationship between these family eating behaviours and measures of adiposity like BMI or skinfold thickness. Consequently the authors stressed that food intake was just one determinant of body weight.

Although it seems to have face validity that obese individuals eat more than their non-obese counterparts empirical results were indeed inconclusive for adults (Romieu, et al. 1988; Miller, et al. 1990; Dreon, et al. 1988) and children (Griffiths, et al. 1987). Still, there seems to be a greater consensus that a higher fat intake played a role in the energy balance and development of obesity (Nguyen, et al. 1996; Wardle, et al. 2001).

Wardle et al. (Wardle, et al. 2001) argued that the importance of genetic factors for the development of obesity were widely accepted and that it was now time to explore the mechanisms by which genotype becomes phenotype. If obesity was seen as the result of a higher energy intake than energy expenditure, one would expect that high-risk groups (like children of obese parents) have different diet and activity levels than children of non-obese parents.

It has certainly been suggested that low energy expenditure is a critical factor in the excessive weight gain of infants born to obese parents (Roberts, et al. 1988). However in more recent studies on larger samples of infants (Davies, et al. 1995; Stunkard, et al. 1999) these findings were contradicted. The earlier study found no

differences in energy expenditure of infants of parents with high BMI vs. parents with a low BMI. However, the authors of the later study clearly stated that it is the energy intake and not the energy output, which determines body size in infants. Studies with older children have come to similar inconclusive results. For older children or teenagers there is of course the methodological problem of determining if obesity is the cause or the result of inactivity. Several researchers have (Robinson 1999) pointed the finger at television viewing as one cause for childhood obesity, because it led to reduced energy expenditure by replacing more physically demanding activities and also to an increased dietary intake during viewing or as a result of food advertising (Gortmaker, et al. 1996).

Lucas underlined the importance of family attitudes and lifestyle for the development of a child's activity pattern (Lucas 1988). She argued that parents who live an active lifestyle encourage their children to do so as well, whereas parents who model a more sedentary lifestyle are setting the stage for their children to be less physically active. Following this argument, obese children are less likely to be physically active for two reasons, firstly because the likelihood is that their parents are obese and model a more sedentary lifestyle and secondly because their obesity makes them feel embarrassed or too weight conscious to participate in sport activities.

One study avoided this methodological problem elegantly by comparing children of overweight and lean parents who were themselves not yet overweight in regards to their food and activity preferences (Wardle, et al. 2001). The authors found that children of overweight families had indeed a preference for sedentary activities like computer games and television watching. Additionally children from overweight families had a higher preference for fatty foods, they were less likely to like vegetables and displayed more 'overeating-type' eating patterns. The authors concluded that the genetic risk of obesity was transmitted to the next generation by differences in diet and activity preferences.

Several longitudinal studies have been undertaken to further investigate the association between different family lifestyle variables and childhood obesity. The studies, which included a measurement of parental obesity, found that it was a high risk factor for the development of obesity (Hood, et al. 2000; Burke, et al. 2001; Maffeis, et al. 1998). Hood et al. (Hood, et al. 2000) found that the children of parents who displayed high levels of disinhibited eating, particularly when coupled with dietary restraint, had the highest increase in body fat. Dietary restraint was associated with being overweight in males and females of all ages (Llunch, et al. 2000). In regards to physical activity the studies came to inconclusive results. For example, physical fitness in teenage years was negatively related to fathers' obesity in daughters and mothers' obesity in sons (Burke, et al. 2001). However, at 8 years of age sedentary activities were independently associated with being overweight but that this association was not maintained over the follow-up period (Maffeis, et al. 1998).

Most studies into childhood obesity stress that an understanding of its aetiology is vital to develop prevention strategies. Early prevention is necessary because once established obesity is refractory to change, and obese children are likely to become obese adults who continue to struggle with their weight. If obesity is that notoriously difficult to 'cure' what are the reasons for still trying?

Obesity in adulthood is a well-established risk factor for musculo-skeletal and cardiovascular diseases, diabetes, and hypertension, and was generally linked with a reduced life expectancy (Lieberman 2000). Equally, in children, obesity represented a risk factor for a number of illnesses (Freedman, et al. 1999; Johnston 1985) and in particular for type II diabetes in children, obesity played a major part (Fagot-Campagna, et al. 2000). But as Lucas stated the psychosocial consequences of obesity had a greater impact on the child than any health risk (Lucas 1988).

As discussed in chapter 2.4.1, society's attitudes towards obesity have changed over time and in our society obese individuals suffer from social and psychological prejudices, which already exist in childhood. Staffieri's classic studies demonstrated that children at primary school age associated obesity with negative characteristics (Staffieri 1967). Research results are consistent: obesity is socially not accepted. Adults and children alike regarded obesity as a condition worse than most physical or mental disorders, and a slim figure was essential in the choice of a partner, in play or marriage (Wadden & Stunkard 1985; Lieberman 2000). Although there are many studies investigating stigmatisation there are fewer studies exploring how obese children felt about themselves. Some studies of the development of self-esteem and body-esteem in overweight and normal weight youngsters have shown that low body esteem has been shown to be related to being overweight and that girls were generally less satisfied with their bodies (Mendelson & White 1982). The relationship between weight and self-esteem was less clear, with self-esteem being differently affected in different age groups. Epstein & Klein assessed moderately obese children and their parents in regards to psychological/psychiatric problems (Epstein & Klein 1994). They found that the majority of obese children had no psychological problems and that parental obesity and parental psychiatric symptoms had a greater impact on the psychological well being of the children than the child's BMI, age or sex.

In summary it seems that obesity is, to a great extent, influenced by genetic factors and that one of the best predictors for the development of obesity is parental obesity. However, dramatically increasing prevalence rates for childhood onset obesity underline the importance of environmental factors. It may be that genetic susceptibility determines which individuals are most likely to become obese but that environmental conditions are instrumental for the transmission from genotype into phenotype. Parental control in the feeding interaction as well as parental eating patterns appear to influence children's dietary intake and consequently lead to a better understanding how genotype turn into phenotype.

4.2.3. Early onset anorexia and bulimia nervosa

Although not as epidemic in proportion as childhood obesity there has been increasing interest in early onset bulimia and anorexia nervosa. This is partly because they appear to become more common but also research in early onset eating disorder provides a testing ground for theories about the aetiology of these disorders (Hodes 1993). The following section will present an overview about epidemiology and potential risk factors for the development of childhood anorexia or bulimia.

Dieting has been implicated as a precipitating or even triggering factor in eating disorders. Furthermore studies assessing abnormal eating attitudes and behaviours in children and teenage girls usually examined their dieting behaviours. Consequently this section will also include studies concerned with dieting in childhood and early adolescence.

The question of how many children are affected by anorexia and bulimia nervosa is difficult to answer because of the different methods of case detection (eating disorder questionnaires, medical records, and referrals) and the different definitions of caseness (Doyle & Bryant-Waugh 2000). The criteria for a diagnosis for anorexia and bulimia nervosa in women are different to those for children. For example whereas for adult women weight loss is a diagnostic criteria, children with anorexia nervosa might fail to gain weight. DSM-IV and ICD-10 criteria have been demonstrated to be of little value for the classification of eating disorders in children, as 50% of children referred to a specialist centre fell in the DSM-IV category of 'eating disorder non-specific' or could not be classified at all (Nicholls, et al. 2000).

Despite an interest in early onset eating disorders few epidemiological studies assessed children for eating disorders as such. An early study amongst girls of age 15 and under in private schools in London detected a prevalence rate of 0.2% for eating disorders (Crisp, et al. 1976). Probably the most thorough study of incidence rates of anorexia nervosa took place in Rochester, Minnesota and was based on medical records from 1935 to 1984 (Lucas, et al. 1991). For the age group of 10 to 14, they

found 25.7 females and 3.7 males per 100,000 of the population per year, the highest incidence rates (43.5) were found amongst 15 to 19 year old females. Even fewer studies exist about childhood bulimia. One study simply states that early onset bulimia was very rare but increased in frequency during adolescence (Hodes 1993). Another could only find 6 cases of pre-menarchal onset in a population of 270 bulimic women (Kent, et al. 1992). Although there is some debate as to whether the prevalence rates within the population are increasing, a general increase of in numbers of patients presenting for treatment of eating disorders has been observed. There has been a dramatic increase in children with anorexia nervosa referred to Great Ormond Street (Bryant-Waugh & Lask 1995). In the 1960s there were only one or two cases per year, then this rate rose slowly in the 1980s to an average of six per year. In contrast to that, the authors reported 25 referrals in the first half of 1994.

In regards to aetiology this section will concentrate on familial and psychological components. However a number of genetic and biological factors have been considered as being relevant for early onset eating disorders and will therefore be briefly summarised.

4.2.3.1. Biological Factors

Reviews of this area have suggested several potential biological risk factors (Bryant-Waugh & Lask 1995; Lask 2000). One such factor was an endocrine disorder, which affected the hypothalamus-pituitary-gonadal axis. It remains open as to whether this dysfunction could be caused by immaturity, damage, or hypersensitivity of the hypothalamic centres for appetite regulation or abnormalities at receptor sites. The authors reviewed further studies concerning abnormalities of brain structure and function. For example, it has been shown that children and adolescents with anorexia had a unilateral reduction of blood flow in the anterior portion of the temporal lobe. Also serotonin levels have been examined as a potential risk factor for the development of eating disorders. Low levels of serotonin are associated with impulsivity, which is an important feature in bulimia nervosa whereas high serotonin levels may play a part in the rigidity and constraint observed in anorexics.

Food intake is not only controlled by the brain, but also peripherally in the gut, where the peripheral satiety system is situated. Consequently studies have investigated the role of gastrointestinal hormones in particular cholecystokinin (CCK). High levels of CCK, which are associated with a sense of satiety, were more commonly found in anorexic individuals whereas low levels of this hormone were found in bulimic individuals. But as Lask (Lask 2000) pointed out, it is inherently difficult to distinguish between those findings which predate the onset of an eating disorder, and those which are a result of starvation, dehydration, bingeing and purging.

4.2.3.2. Genetic Factors

There is now persuasive evidence from family and twin studies that genetic factors are of significance in the development of anorexia and bulimia. Theander (Theander 1970) first noticed an increased prevalence of anorexia in sisters of anorexics and since then a number of well-designed studies have examined whether familial aggregation could be found in eating disordered populations. The tendency for a particular illness to cluster among relatives is a hallmark of intergenerational transmission (Strober 1995). Most studies in this field have demonstrated that bulimia and anorexia nervosa were several times more common amongst the biological relatives of anorexic and bulimic subjects than in the general population (Strober 1991). For example, evidence for genetic clustering has shown rates of anorexia and bulimia declining from first- to third-degree relatives with a tendency for the family members to be affected by the same disorder as the index subject (Woodside, et al. 1998).

Familial aggregation studies have the inherent difficulty in differentiating between the environmental and genetic components, which is why the study of twin pairs has become an increasingly important focus in genetic research. Twin studies have the advantage that statistical analysis of differences in concordance rates between monozygotic (MZ) and dizygotic (DZ) twin allow conclusions about the magnitude of the genetic component. The concordance rates for anorexia nervosa were found to be up to 10 times greater for monozygotic than for dizygotic twins (Lask 2000). These findings implicated a strong genetic component with heritability estimates

ranging from 0.5 to 0.9 (Strober 1995). Twin studies have also examined the concordance rates for bulimia nervosa. One small study of twins found concordance rates of 83% for MZ and 27% for DZ twins (Fichter & Noegel 1990) and another population based twin study found significantly higher concordance rates for MZ than for DZ bulimic twins (Kendler, et al. 1991).

Not only eating disorders, but also eating attitudes and behaviours as such, have been shown to have a genetic component, for example, a heritability of 0.4 to 0.5 has been shown for overall EAT scores and EDI subscales within a normal twin female twin population (Rutherford, et al. 1993). Another study examined female twins regarding their weight, shape and eating attitudes and found that the correlations between MZ were higher than those of DZ twins (Wade, et al. 1999). The authors decomposed the variance of disordered eating into four types of general influence namely: additive genetic factors, non-shared environmental factors, shared environmental factors, and finally dominant genetic factors. Similarly to Kendler et al. (Kendler, et al. 1991), they found that the influences most likely to determine individual variation in disordered eating are additive genetic and non-shared environmental which explained 60% and 40% of the variance respectively. However the significance of non-shared experiences does not rule out all aspects of the family environment as children raised in the same family can still experience their environment differently (Murphy, et al. 2000; Daniels & Plonim 1985).

4.2.3.3. Psychological Factors

Looking at more psychological components, one study of risk factors specific for early onset bulimia nervosa made the point that those individuals who developed bulimia earlier than average might have a higher loading on risk factors (Schmidt, et al. 1992). Indeed they found that the younger onset group more often reported a family history of depression and overall inadequate parental control than a group with later onset bulimia nervosa. Risk factors for the emergence of early eating disturbances (like secretive or inhibited eating, overeating and vomiting) have also been studied prospectively (Stice, et al. 1999). Following a group of children and their parents for the first five years of their children's lives, the authors found that

maternal body dissatisfaction, dieting, bulimic symptoms and the BMI of the parents predicted early eating disturbances. Additionally certain child characteristics like BMI during the first few months of life and infant feeding were predictors for early eating disturbances.

Substantial attention has been paid to the role of trauma, particularly childhood sexual abuse, in the aetiology of anorexia and bulimia. However, the conclusions regarding a link between childhood sexual abuse and eating disorders remain conflicting. There is clear evidence of high prevalence rates for childhood sexual abuse in eating disordered populations (Waller 1991; Sloan & Leichner 1986; Palmer, et al. 1990). Depending on the measurements used and the definition of sexual abuse these rates ranged from 34% to 83% (Bryant-Waugh & Lask 1995). It has been suggested that the response to childhood sexual abuse might be disgust with feminine characteristics and sexuality (Oppenheimer, et al. 1985). This disgust could find expression in an over concern with body image or even anorexia nervosa.

Contrary to Oppenheimer's hypothesis another study found relatively low rates of sexual abuse within a restricting anorexic group and much higher rates amongst bulimics (Waller 1991). A further study by the same author, showed that also the nature of the abuse was of significance in the clinical presentation of bulimia (Waller 1992). The frequency of bingeing behaviour was particularly high amongst women who reported sexual abuse, in particular if the abuse occurred before the age of 14. If the abuse was intra-familiar the women were also likely to vomit more frequently. However, Finn et al. (Finn, et al. 1986) argued that these links were not established but that eating disorders and sexual abuse simply had high prevalence rates in the population. Pope & Hudson (Pope & Hudson 1992) made a case for prospective studies investigating childhood sexual abuse as a risk factor for the development of eating disorders. In the absence of such studies they reviewed controlled retrospective studies and concluded that bulimic subjects did not have substantially higher prevalence rates of childhood sexual abuse than control groups. What's more, a review of studies of sexual abuse in the general population produced prevalence

rates of between 27% and 51%. The authors concluded that the prevalence rates for bulimic patients fell well within the same range as those for the general population. Another important point was made by Kinzl et al. (Kinzl, et al. 1994) who argued that it is not the sexual abuse per se which led to psychological problems, but that it was confounded by the adverse family background around the abuse. Their sample of female university students demonstrated that women who had experienced abuse were no more at risk of developing an eating disorder but that those who reported an adverse family background were at higher risk for eating disorders.

The above studies were based on retrospective reports of adult women, but a more recent study used 10 to 15 year old girls as informants (Wonderlich, et al. 2000). A comparison of test results from abused versus non-abused girls revealed that the abused children had higher levels of body dissatisfaction and overall they preferred a thinner ideal. Additionally girls with experiences of abuse had higher levels of purging and bingeing behaviours.

To summarise the divergent views about an association of childhood sexual abuse and eating disorders it seems likely that early sexual trauma may be a contributing factor in the aetiology of eating disorders in a significant number of individuals, but it is neither sufficient nor necessary nor specific for the development of anorexia or bulimia (Bryant-Waugh & Lask 1995). Although research has focused on childhood sexual abuse there are other forms of childhood adversity, which might be contributing to the development of an eating disorder. One study looked at factors like physical and sexual abuse, psychiatric history of parents, family structure and separation (Schmidt, et al. 1993). They found that different factors of adversity tended to cluster in the same patients and that in particular bulimic patients had experienced two or more types of adversity in their childhood. Bulimics were also more likely than anorexics, or bulimics with a history of anorexia nervosa, to report excessive parental control. Expanding on the issue of control and adversity in childhood, Troop & Treasure's (Troop & Treasure 1997) study compared women with a history of eating disorder (n=43) and those without eating disorders (n=20). In

contrast to the above studies this study did not focus on whether eating disordered women experienced more traumatic events in their childhood but on the question of how the two groups dealt with the adverse events in their childhood. In contrast to the similar rates of adversity (ranging from teasing to abuse) experienced by the two groups their responses differed significantly. Whereas childhood helplessness was more frequent in women with eating disorders - in particular bulimia - childhood mastery was more frequently observed in women without eating disorders. However, the number of subjects was relatively small and the researchers specifically aimed to recruit control subjects who had experienced adversity. Given this recruitment bias it seems a possibility that particularly women who did develop successful coping strategies in dealing with adverse events responded and took part in the study. Still, it is an interesting perspective on the impact of sexual abuse and underlines that psychiatric disorders are not an inevitable consequence of childhood adversity.

4.2.3.4. Dieting

A look at putative risk factors for early onset eating disorders would not be complete without examining the role of dieting within a child and adolescent population. Dieting amongst adolescent girls has been accepted as almost normative behaviour with prevalence rates of up to 70% (Wadden, et al. 1989) but the notion of children dieting has also been more recently investigated (Hill 1993).

It has been argued that, particularly at a young age, dieting is not an innocuous practice as the self-enforced restriction of food intake might deprive the growing body of nutrients at a time when they were most needed. In children as young as nine years of age it has been demonstrated that the restrained eaters consumed 11% less energy than the daily-recommended allowance for girls of that age and showed a tendency to skip meals (Hill & Robinson 1991). In addition excessive weight loss at a young age could lead to retardation of growth and delayed puberty (Pugliese, et al. 1983). A review of studies regarding early dieting behaviours stressed not only the physical but also the psychological dangers of early dieting (Hill 1993). Dieting has been shown to alter and impair cognitive processes in adults and furthermore an increased preoccupation with food could lead to feelings of reduced control over

eating. According to Polivy & Herman dieting did not only normally precede eating disorders but was causal in the their development (Polivy & Herman 1985). A prospective study of 15-year-old girls found that, for the majority of girls, dieting did not lead to extreme concerns about food and weight but that on the other hand dieters had an eight-fold increased risk of developing eating disorders compared with non-dieters (Patton, et al. 1990).

A later longitudinal study by the same group followed a cohort of 14 to 15-year-old students over three years and found that dieting was the most important predictor for the development of new eating disorders (Patton, et al. 1990). Girls who were dieting at a severe level were 18 times more likely to develop an eating disorder than girls who were not engaged in dieting behaviours. In addition girls who were dieting moderately were still 5 times more likely to develop eating disorders than non-dieting girls.

Given the potential risks for the psychological and physiological well being it is important to examine the reasons why children diet. As discussed in chapter 2, even young children have a negative view of obesity. For example, even 5 year old children were motivated to avoid obesity and that from that age onwards they perceived a relationship between eating and obesity (Edelman 1982). In a survey of American children ranging from 7 to 13 years, 45% of them wanted to be thinner and 37% had already undertaken steps to loose weight (Maloney, et al. 1989). Additionally the authors could show that, according to the scores of the children's version of the Eating Attitudes Test, 8.8% of the girls could be classified as anorexic. Overall the figures are very similar to the results of surveys of adolescents and college populations. A more recent study within the same age group found that 50% of all children wanted to be thinner and 16% reported attempting weight loss (Schur, et al. 2000). The researchers found the children well informed about food choices and exercising and that the main source of information was the immediate family. Also a similar study with British children underlined that at age 9 girls not only have concerns about their weight but that they are actively trying to restrain their eating

with the goal of losing weight (Hill & Robinson 1991). In a comparison of 9-year-old and 14-year-old girls both groups expressed high levels of body dissatisfaction and shared a similar range of dieting motivation (Hill, et al. 1992). For both groups the motivation to diet was more related to the perception of their body shape than their actual weight and nearly 80% of the normal weight girls and 40% of the underweight girls had dieted to lose weight. The authors interpreted their findings as an indication that children embraced adult values of thinness and attractiveness and that consequently some of them were struggling with their physical appearance and eating behaviour.

A recent study looked at body dissatisfaction and weight concerns in 5-year-old girls (N=197) and their parents (Davison, et al. 2000). Higher weight was associated with greater body dissatisfaction, which in turn was associated with higher weight concerns, and this was true for the girls as well as their parents. Additionally the combination of the girls body dissatisfaction and mothers' own weight concerns were independently positively related with the girls' weight concerns. The influence of parental (or more commonly maternal) weight concerns has been investigated by a variety of studies. Interviews with the mothers of 10-year-old girls who scored particularly high or low on a dietary restraint questionnaire found a strong association between the degree of dietary restraint of the girls and that of the mothers (Hill, et al. 1990). Furthermore the highly restraint girls had, like their mothers, a susceptibility to eat as a result of being upset or bored and overall higher scores on the EAT than the girls with low dietary restraint. As discussed earlier (section 4.1.3) the mothers of highly restrained 11-year-old girls reported more snacking and fasting themselves and also rated their daughters' attractiveness lower than comparison mothers (Hill & Franklin 1998).

Another study investigated the role of the mother-daughter relationship on weight concerns in a slightly older sample of girls aged 16 to 19 years (Ogden & Stewart 2000). The authors found no support for the hypothesis that mothers were simply models for their daughters' weight concerns as no significant association between

mothers' and daughters' weight concerns could be found. However body dissatisfaction and restrained eating were more common among daughters whose mothers reported a low belief in their and their daughters' autonomy and if mother and daughter rated projection as an important part of their relationship. The authors concluded that the transmission of weight concerns occurs via a complex system of interactions between mothers and their daughters that not only involve weight or shape issues. A further study indicated that girls do not just copy their mothers' behaviour but that other factors influence the decision to diet (Huon & Walton 2000). The study compared girls who had begun to diet recently with girls who have never dieted. Those initiating dieting perceived a higher level of influence by parents and peers to diet and were overall more likely to conform and comply with their parents. On the other hand the girls who never dieted perceived their fathers as being more supportive.

Few studies have investigated the role of the father in the development of eating behaviours or body image. Striegel-Moore & Kearney-Cooke's findings suggested that mothers and fathers rated the physical attractiveness of their child similarly and were equally satisfied with their child's eating habits (Striegel-Moore & Kearney Cooke 1994). Overall parents with younger children evaluated the child's physical appearance and eating habits most positively and reported the highest level of praise and the lowest level of criticism. As demonstrated in the above studies, parents who themselves were trying to diet were more likely to encourage their children to do so and this was true for mothers and fathers. Then again a partially contradictory study found that adolescent daughters were more likely to diet if their mothers made negative comments about their weight and described them as overweight, but this relationship could not be found in the father-daughter relationship (Keel, et al. 1997). Negative comments about weight and shape by parents or peers have been shown to have a detrimental effect on the development of a positive body image. A sample of 10 to 15-year-old girls showed a relationship between the extent of being teased about physical appearance, body image dissatisfaction and eating disturbances (Fabian & Thompson 1989). It is maybe an expression of the impact of teasing on

the individual that even in adult populations these negative effects of being teased in childhood still existed in adulthood (Thompson, et al. 1991).

In conclusion, although there is some debate if childhood anorexia or bulimia nervosa are indeed becoming more prevalent, there is little doubt that referrals rates to specialist centres are rising and that there are numerous children who suffer from some form of eating disorder. As is the case with later onset eating disorders, the aetiology is complex and probably an interaction of factors like genetic, biological, familial, personality and socio-cultural factors. Trauma like childhood sexual abuse can contribute to the development of an eating disorder but because of the high prevalence rates in the population this hypothesis remains controversial. Numerous studies have implicated dieting in the aetiology of eating disorders and it has been shown that even young children have embraced cultural stereotypes of thinness and are trying to diet. This is particularly worrying as many of those children are normal or even underweight and their dieting might progress to a form of eating disorder. Body dissatisfaction and weight concerns have been shown to be related to parental attitudes towards their own and their child's appearance and eating behaviour.

From a research point of view it would be desirable to have randomized double blind studies to establish, for example, what kind of early feeding pattern has the most long-term benefit. Additionally, prospective studies would be the gold standard to determine what, or if, early factors are associated with the development of an eating disorder. Clearly, the absolute majority of the studies presented here fall short of this standard and for obvious reasons. As an example, most parents feel very protective of their children and would be unlikely to conform to a research protocol interfering with the way they want to bring up their child. Prospective longitudinal studies into eating behaviours are rare because following large numbers of subjects over several years requires extensive personnel and financial resources (e.g. see Marchi & Cohen 1990). The reality of eating disorder research - like many other fields - is that studies have to rely on retrospective reports (for a further discussion of the use of

retrospective data in section 5.2), the groups are not randomized and the sample sizes are relatively small.

The previous chapters have attempted to provide an overview of the current state of research into early eating behaviours and eating disorders. Attempts have been made to limit the publications cited to those that involved at least reasonable numbers of subjects or gave a comprehensive review of studies in a particular area. In the previous chapters is has been argued that eating and feeding is culture specific and undergoes constant changes. Given that the study was undertaken in Britain with the majority of informants being British, where possible it has tried to concentrate on British studies. However North America undeniably has a strong presence in the treatment and research of eating disorders, which has been reflected in the previous chapters. In addition many sociologists and psychologists have argued that eating, and potentially eating disorders, follow a trend set by America, which supports the generalization of American results on to British conditions.

Although eating disorders is a rapidly increasing field of research there are still gaps which merit attention and further investigation. Reviewing the available literature it becomes clear that eating disorders like anorexia and bulimia nervosa are often treated completely separate from obesity. Whereas the approach to the former is often psychological in nature, research into the latter is often dominated by a physiological approach. The present study attempted to integrate these two fields by involving obese informants as one of the sub-groups. Furthermore many studies base their findings either on patients who attend a specific treatment center or alternatively purely on college or university students. In contrast the current study, presented in the following chapters, involved women who were currently or in the past in treatment as well as women who have never received professional help. In a way this sample is more representative of the 'true' population of eating disordered women than a purely clinical one. Finally, the present study is intended as an exploratory study utilizing different methods of data collection (questionnaires and interview) as well as different methods of data analysis (quantitative and qualitative).

In comparison to other studies this has the advantage that, not only particulars like family structure, meal contents and dieting history can be established, but also emotions associated with these particulars can be explored. The following chapters will give an insight how this ambition was realized.

5. Methods

The aim of the previous chapters was to provide the theoretical background on which the present study was based. Links were made between changing historical and social conditions and changes in outlooks on food and eating. It has been demonstrated that in our current society infancy and childhood are regarded as key stages for the establishment of eating patterns.

Not only do children have to learn how to eat, they also need to learn to recognise when they are hungry and when they had enough food. Furthermore, they have to develop their own individual food preferences. As shown in the previous chapters, this learning occurs within a social context, at an early age when the family plays a key role. It is usually a parent who feeds a baby and also in later childhood parents set rules and examples in regards to food and eating. Of course this is not only true for the development of normal eating but equally for the development for eating problems. An extensive body of research has been presented trying to establish what particular aspects of the family are potentially involved in 'producing' disordered eating. However, very few of those studies involved obese women as a comparison group. If anorexia and obesity are regarded as the opposite extremes of eating behaviour it would be interesting to know if those extremes are the result of a different upbringing in regards to food and eating.

Consequently the objective of the present study was to explore and compare the early influences on eating patterns of women with different forms of eating problems, in particular women with anorexia nervosa, bulimia nervosa, obesity and those without a history of eating problems.

The two main questions of interest were: do women with any form of eating disorder experience a different 'socialisation' towards food and eating than women without an eating disorder? Secondly do the four different sub-groups differ from each other and if so, in what way?

5.1. Informants

Eating disorders are generally seen as a "women's problem" and although this is not necessarily the case eating disorders are much more prevalent in the female population (Habermas 1990). As discussed in previous chapters the socialisation in regards to food and eating is quite different for the two genders. To remove the effects of this possible confounding factor the study involved exclusively females. The participating women were fully informed about the purpose and progression of the study and provided written consent (see appendix).

The participating women were not placed under different experimental conditions and particularly the interview required the sharing of often very personal memories, to reflect this the participating women will therefore be referred to as informants.

The author is aware that obesity is a description of body weight, or body mass and is, as such, not an eating disorder per sae, just as being underweight is not the only criterion for anorexia nervosa. But in order to meet the objective of the study to compare women with very different eating patterns obese women were included as one of the sub-groups. A commonly used weight-height index is the Body Mass Index (BMI) and although it does not discriminate between muscle and fat mass it is a simple and reliable measure of overall obesity. Different recommendations exist as to what the cut-off point for obesity should be. The WHO recommended in 1986 for women a BMI of >28.6 as a cut off point for obesity and a BMI range from 23.9 to 28.6 as a definition of overweight. In contrast to these recommendations several epidemiological studies use a BMI between 25 and 30 as a criterion for overweight and a BMI of at least 30 as a definition of obesity. In line with the majority of epidemiological studies a BMI of >30 were chosen to define obesity.

The inclusion criteria for the study were as follows:

Anorexic Women: Currently or in the past fulfilling DSM-IV criteria for anorexia nervosa.

Bulimic Women: Currently or in the past fulfilling the DSM-IV criteria for bulimia nervosa.

Obese Women: Currently or in the past having a BMI of 30 or more. Presence or absence of Binge Eating Disorder was neither exclusion nor inclusion criteria.

Normal Women: Normal in this context was defined by the absence of any current or previous eating disorder or severe eating problem.

In addition, all participating women had to be born later than 1959 and at the time of interview had to be at least 18 years of age. Any subject suffering concurrently from a psychotic disorder or other major psychiatric condition was excluded. Sufferers from a physical disorder (e.g. diabetes, or celiac disease) that imposes strict dietary restriction as part of the treatment as well as those who suffered from such a condition in childhood were excluded.

The original plan was to interview mothers and sisters of the informants, partly to get more information about early feeding experiences but also to explore the importance of shared versus non-shared environmental influences. Unfortunately in the interview situation very few informants gave their permission to contact their families of origin. Particularly amongst the bulimics this might be explained by the fact that their parents were not aware of their eating disorder and that they did not want to alert them by the fact that they took part in this research project. Other participants

just stated that they did not want to involve their families and this was true even for the normal group. Consequently this part of the study had to be abandoned.

The recruitment of informants took place in a variety of ways to attract as many women as possible form different backgrounds. A number of informants were recruited via the Cullen Centre, which is a unit specializing in the outpatient treatment of eating disorders and is attached to the main psychiatric hospital in Edinburgh. An information sheet about the study (see appendix) was displayed in the waiting room. Furthermore the nurse therapists mentioned the study to the clients in treatment groups for bulimia and overeating as well as in individual therapy sessions. Clients who showed an interest in taking part in the study received a copy of the information sheet. In addition self-help groups dealing with eating problems and slimming clubs within the community were contacted and provided with information about the study. To attract informants who weren't currently in treatment groups information sheets were displayed in public places like university libraries and local shops in Edinburgh and Bristol. Lastly adverts were placed in different local newspapers.

Despite these stringent efforts it proved very difficult to recruit suitable volunteers for this study (the time frame for data collection is included in the appendix) and the original target of 30 informants for each group could not be achieved. Consequently group size had to be adjusted. Included in this study were 18 anorexic women, 18 obese women, 21 bulimic women and 20 normal women (N=77). It is impossible to determine from what initial source the informants were recruited as they were overlapping and some informants saw the information in different places. Later analysis of the data showed that 33% of the obese, 50% of the anorexic and 53% of the bulimic group had ever been in contact with the Cullen Centre because of a problem with eating. Although a selection bias can't be excluded, most of the informants had received some form of treatment for their eating disorder and many had been in contact with a variety of places (self help, GP, other psychiatric hospitals, etc.). Given the life threatening nature of anorexia nervosa it seems

unlikely to find adequate numbers of anorexics without any treatment experience whereas obese informants are more likely to be found in the community. The purpose of the widespread recruitment procedures was to find as many informants as possible from a variety of backgrounds.

All potential informants in the study made contact with myself via the telephone number given in adverts and informationsheets. Further information about the purpose and procedure of the study was provided and it was preliminarily checked that the caller fulfilled inclusion criteria for the study. If this was the case the woman was invited to take part in a one-off interview with myself. The interviews took place in an office within the Royal Edinburgh Hospital or if the informants preferred it, in their homes. At the beginning of the meeting it was again explained what the study involved, that participation was voluntary and confidential and that consent to take part in the study could be withdrawn at any stage. The informants had the opportunity to raise any remaining problems and were then asked to sign a consent form (see appendix). Before the start of the study ethical approval was obtained form the appropriate LREC.

The meeting lasted on average 1 to 1½ hours. In six cases it was not possible to meet the informants face to face due to geographical distance or time constraints of the informant. Considering the difficulties in recruiting informants it was decided to send questionnaires and interview guideline (including added information) by post. In either situation the informants completed the following measures:

Eating Attitudes Test (EAT) (Garner & Garfinkel 1979) is a well-validated questionnaire, which consists of 40 items evaluating a broad range of anorexic target behaviour and attitudes. It produces four scores for Dieting, Bulimia and Food Preoccupation, Oral Control and finally a Total score.

Bulimic Investigatory Test Edinburgh (BITE) (Henderson & Freeman 1987) is self-rating questionnaire, which results in a symptom score reflecting bulimic attitudes and thoughts as well as a severity score reflecting the extent of bulimic behaviours like bingeing and purging.

Eating Disorder Inventory (EDI) (Garner, et al. 1983) is a 64 item, self-report measure designed for the assessment of psychological and behavioural traits common in anorexia nervosa and bulimia nervosa. It consists of the following eight subscales: Drive for Thinness (DT), Bulimia (B), Body Dissatisfaction (BD), Ineffectiveness (IN), Perfectionism (P), Interpersonal Distrust (ID), Interoceptive Awareness (IA), and Maturity Fears (MF).

The above questionnaires all assessed the informants' current behaviours and attitudes whereas the following measures were aimed at the informants' recollection of relationships and events in their childhood.

Physical Appearance Related Teasing Scale (PARTS) (Thompson, et al. 1991) is an 18 item scale consisting of the factors Weight/Size Teasing (W/ST) and General Appearance Teasing (GAT). Because the questionnaire concentrated on being teased by male family members two questions about female members were added (PARTS female), which were scored separately.

Parental Bonding Instrument (PBI) (Parker, et al. 1979) is a 25 items self-rating instrument containing statements concerning parental attitudes and behaviours. Separate forms have to be filled in for each parent. Two factors have been established by factor analysis, namely Care and Overprotection. The first factor comprises of items, which reflect content, affection and closeness at one extreme and indifference and rejection at the other. The second factor includes items, which suggest intrusiveness and control at one pole and encouragement and autonomy at the other.

For the purpose of the study a semi-structured interview was constructed, which was to a certain extent based on interviews of a previous study with bulimic women (Schulz & Freeman 1995). This interview was modified and expanded to explore other areas of relevance for the objective of the present study. For the construction

of the interview Brewin et al.'s (Brewin, et al. 1993) recommendation to improve the quality of retrospective reports were followed where possible. A small number of volunteers (n=5) were recruited to test and practice the interview; these volunteers were not included in the actual study. Changes to the interview guideline were made following the pilot stage, before its final form was established.

The final interview took about 45 to 60 minutes and included the following sub-sections:

Family History (e.g. demographic information, psychiatric history of other family members)

Eating Pattern within Family (shape of other family members, meal situations, use of food as reward or punishment, food restrictions, eating behaviour of other family members)

Eating History of Subject Herself (e.g. feeding patterns, feeding problems, food aversions)

Body Image (e.g. early body shape, appearance related criticism, comparison with contemporaries)

History of Eating Disorders was only elicited from members of the three eating disordered sub-groups and contained questions about the reasons, progress and duration of their eating disorder.

There are principally three ways of recording an interview, namely taping the interview, taking notes during the interview and writing them up after the interview

and lastly making notes shortly after the end of the interview (see Whyte 1982 for a fuller discussion of these various techniques). The decision to adopt the second approach was made for several reasons mainly practicality. At the onset of the study it was planned to interview 120 women plus their mothers and/or sisters. Within the constraints of a study with one research worker it would have been impossible to transcribe in excess of 200 interviews, lasting approximately an hour. In addition although taping provides the fullest account, it adds formality to the interview situation. Particularly when highly personal information is shared some informants might feel inhibited by the presence of a tape recorder. On the other hand, it was necessary to take notes during the interview because many of the questions were very specific and it would have been impossible to remember all the details. The interview was there as a structure and guideline, but was handled flexibly. Some of the questions were very specific or gave the informants a choice of answers, but often the informants would elaborate and these comments were taken down and included in the qualitative analysis. Other questions were more open and the participating women were encouraged to give examples of their own experiences. In either case the answers or comments were written down as verbatim as possible. The author is aware that by taking notes the interviewer makes a decision about what is relevant to the study and what isn't. However even the coding of complete transcriptions involves a selection as the condensing of information is a necessary part of any qualitative research process.

Due to the nature of the present study the majority of the questions concern episodes or events in the informants childhood and therefore encounter problems inherent with this kind of retrospective data. In order to justify the use of retrospective data within this research project I firstly would like to refer to Brewin, Andrews, and Gotlieb's (Brewin, et al. 1993) appraisal of retrospective reports. The Authors summarised the objections to taking psychiatric patients' accounts of their childhood into three categories. The first category concerned normal limitations in memory; memories of childhood experiences are bound to be imperfect in all individuals regardless of their clinical status. The second category referred to the general memory deficits connected with psychopathology, people with depression or anxiety disorder may be

more likely to have inaccurate recall of childhood memories due to their condition. In the case of eating disorder this category could also include cognitive dysfunctions due to malnutrition. The third category included criticism regarding mood congruent memory processes. The following subsections answer these three categories of criticism in order.

5.1.1. Normal limitations of memory

A large number of studies in the field of social and cognitive psychology have shown that there are specific effects which alter the recollection of past events and experiences, like self-serving attribution bias, egocentricity, cognitive consistency, etc. A way of testing the reliability of personal recollections is to compare them either with previously given accounts or with the recollections of the same events by others. Yarrow, Campbell & Burton (Yarrow, et al. 1970) undertook a study where they interviewed mothers and children and compared these retrospective data with the original data, collected three to thirty years earlier. In the context of the current study it is particularly interesting that the authors found the recollection of the children to be more similar to the original records than those of the mothers.

Studies about the consistency of recall over time showed that the result very much depended on the kind of information asked for and the way it was asked. Robins et al. (Robins, et al. 1985) undertook a study in which they interviewed people who had attended a child guidance clinic 30 years earlier. The subjects were in their 40s at the time of interview, and their account of past family life was compared with the original records of the clinic. The study demonstrated that there was high level of agreement on items like family separation but marked differences on items like source of family income. This discrepancy was explained by the circumstance that as a child the subject might not have been aware if the family received welfare but that they experienced themselves if their parents separated or not. Brewin et al (Brewin, et al. 1993) concluded that autobiographical recollections were not free from error but that targeting the broader outline of events, and avoiding asking for information

for which the subjects had an only inadequate base of information can improve the quality of recall.

5.1.2. General memory deficit in psychopathology

Brewin et al. (Brewin, et al. 1993) stated that the studies about a negative effect of depression on short-term and long-term memory were inconsistent. Whereas some researchers could detect those negative effects, other research groups came to the conclusion that depressed patients complained more often about memory difficulties than non depressed subjects but in fact performed equally well in memory tasks. An alternative explanation for memory difficulties could lie in the motivation problems of depressed patients, which might lead to less encoding or less active retrieving of information. The influence of depression on accuracy of recall is only relevant for the present study in so far as eating disorders are often associated with depressive symptoms. In a 10 year follow up study previously undertaken with bulimic women it was found that 26% had a life time diagnoses of a major depressive illness (Schulz & Freeman 1995). Furthermore the initial assessment (1992-1995) of newly referred bulimic women to the Cullen Centre using self-report questionnaires showed mean scores, which indicated a depressive illness. Given that some of the informants for the present study were recruited via the Cullen Centre, it is plausible to expect the existence of some depressive symptoms. However, informants with a current diagnosis of any major psychiatric illness other than an eating disorder where excluded from the present study, thereby removing this potential source of bias.

Additionally the effect of malnutrition on memory, particularly in the case of anorexia nervosa, might be of importance. Computer tomography scans have shown structural brain alterations in patients with anorexia nervosa as well as in normal weight bulimics (Lauer, et al. 1990) and loss of concentration is often described as a side effect of eating disorders. Strauss & Ryan (Strauss & Ryan 1988) examined cognitive dysfunction in eating disorders. They found that anorexics (restricting and bulimic anorexics) made more logical errors than the control group, but that there was virtually no difference between control group and normal weight bulimics and a

sub-clinical group. The study also looked at performances in regards to so-called cognitive slippage and conceptual complexity; no significant differences between the five sub-groups could be found. What's more, clinical experience has shown that patients with severe eating disorders are still capable of achieving excellent results at school or work, even if they had at very low weight.

King, Polivy & Herman (King, et al. 1991) looked at selective processing in different eating disorder sub-groups. The hypothesis was that people who are very concerned about their weight and eating are more likely to remember others' weights and weight related behaviours. Their findings demonstrated that obese and anorexics were biased to recall more weight and food information than controls.

To conclude: although eating disorders might be associated with some cognitive difficulties, eating disorder sufferers can be expected to perform sufficiently, particularly given that the study will concentrate on food and eating issues. Furthermore all informants were motivated to take part in the study, given that participation was completely voluntary and didn't involve any financial gains.

5.1.3. Mood-congruent processes

Theories like Beck's cognitive therapy model made the assumption that depressed patients have a negative perception of the world and consequently their own past. One could argue that the often-found association between the retrospective reports of adverse parenting and psychiatric disorders - like depression - are based on this negative recall bias. Again, studies investigating this subject come to inconsistent results. Concerning the reliability of the recollection of parental care Lewinsohn & Rosenbaum (Lewinsohn & Rosenbaum 1987) undertook a study in which they questioned a community sample about three parental care factors (positive involvement, negative control, lax discipline). In a one-year follow-up the self-report measures were repeated. The study demonstrated that the subjects who were depressed at the time recalled their parents as significantly less loving and more

rejecting than subjects who were not depressed at the time of assessment or had never been depressed in the past. Lewinsohn & Rosenbaum took these results as evidence that negative mood negatively biased recall and didn't necessarily reflect reality. On the other hand, Brewin et al (Brewin, et al. 1993) cited a number of studies demonstrating that the recall of parenting was extremely stable and not influenced by mood status. For example, Robins et al. (Robins, et al. 1985) collated reports of early home life of patients with depression, patients with alcoholism, and controls without a psychiatric disorder. These reports were then compared with reports from their siblings. Their results showed that that agreement between siblings and subjects was not influenced by the existence of a psychiatric disorder.

Several ways were suggested to insure the reliability of retrospective data. The reviewed studies indicated that accuracy of recall depends to a large extent on the events, which are to be recalled, and on the instruments used in the studies. The implications for the present study were to ask for specific events not only for general statements about attitudes toward food and eating. Brewin et al (Brewin, et al. 1993) argued that questionnaires have been successful at measuring global attitudes towards parenting but that semi-structured interviews are the measure of choice to assess specific childhood experiences.

In summary the reviewed studies highlighted problems with retrospective information and recall bias. Conversely it has been shown that retrospective data were less biased if appropriate measures were taken. Although not without flaws, retrospective data can be valuable and have their place in psychological research.

Of course one of the main reasons for using retrospective data is practicality. There are many studies about the family characteristics of women with eating disorders (Calam, et al. 1990; Wonderlich, et al. 1994 etc.). The research teams used questionnaires, interviews, and structural analysis of parent-child relationships, but almost all of them were based on retrospective data. There are few longitudinal studies like Marchi and Cohen's (Marchi & Cohen 1990) study about the association

between early childhood eating behaviour and adolescent eating disorders. Their study involved the screening of 800 children who were followed over a period of 10 years. In the age group of 9 to 21 year old females (N=326) they found 4 cases of anorexia nervosa and 8 cases of bulimia nervosa. With similar rates one would have to assess more than 1600 girls and follow them up over a lengthy period of time to achieve a sample of 20 anorexics. Although it would have been interesting to see the results of such a study it would have been far beyond the point of what could be realistically achieved within this PhD project.

5.2. Data Analysis

Due to the different nature of measurements used within the study the data obtained allowed or required different methods of analysis.

Questionnaire Data: The questionnaires described above (BITE, EAT, EDI, PARTS, PBI) all produced data, which were approximately normally distributed. Differences between the four groups were therefore analysed using four-way analysis of variance (ANOVA). In addition, the four groups were collapsed into two groups of women with eating problems and normals. T-tests were used to directly compare these two groups. In all cases two-tailed non-paired t-tests were performed with equal variances not assumed.

Interview Data: Basic continuous demographic data like age, weight, family size etc. were analysed in the same way as the questionnaire data outlined above.

To give an indication of the relationship between the above variables a series of bivariate correlations was conducted and Pearson correlation used to determine the significance level.

However the majority of the interview questions elicited categorical data. In these cases Chi-square tests were used to allow a comparison of between group differences.

6. Results

The following chapter is organised into two main parts relating to the main hypotheses of the study. This first hypothesis concerned the question of whether there are differences between the four groups (anorexic, bulimic, obese, and normal) regarding their general family environment, in particularly their upbringing relating to food and eating. Subsequently the results in relation to the second hypothesis will be presented, namely if the informants without a history of an eating disorder differ from those with an eating disorder.

6.1. Comparison between the anorexic, bulimic, obese and normal sub-group

ANOVAs were performed to establish if the four sub-groups were different from each other in their responses to the questionnaires and responses to questions on interval data level (e.g. age, weight, age of menarche).

Unsurprisingly the results of the eating behaviour questionnaires (BITE, EAT, EDI) were highly significantly different with the normal subgroup consistently scoring the lowest results (see table 1). In other words the normals demonstrated the least pathological attitudes and behaviours in relation to eating.

The obese and bulimic sub-groups scored very similarly on the BITE and showed the highest scores on both sub-scales. Maybe more surprising is that the bulimic group also had the highest overall scores on the EAT, an instrument which is aimed at anorexic target behaviours. The four sub-groups differed significantly on all sub-scales of the EAT (Dieting, Bulimia and Food Preoccupation, Oral Control) as well as on the total score. The subscale where anorexics had the highest result was Oral Control.

The only scale, of all the eating behaviour related questionnaires, which didn't show a significant difference was the EDI sub-scale Interpersonal Distrust. This means that the four groups don't differ significantly in regards to their eagerness/reluctance to form close relationships. The other EDI subscales demonstrated that the obese

subgroup was most dissatisfied with their bodies, had most bulimic attitudes/behaviours and felt most ineffective.

Table 1 Eating Behaviour Questionnaire Results
One Way ANOVA

Questionnaire		Group Mean ± Std. Deviation				F
		Anorexic N=18	Bulimic N=21	Obese N=18	Normal N=20	
BITE	Severity	11.5 ± 7.5	17.1 ± 7.7	16.3 ± 8.8	3.8 ± 3.9	14.22**
	Symptom	3.6 ± 4.3	5.8 ± 4.7	5.4 ± 6.3	0.5 ± 1.1	5.85**
EAT	Dieting	11.2 ± 8.6	13.4 ± 9.3	8.6 ± 9.6	1.0 ± 1.3	9.53**
	Bulimia & Food Preoccupation	3.3 ± 4.4	5.8 ± 4.7	4.9 ± 5.0	0.8 ± 2.0	6.85**
	Oral Control	5.9 ± 5.2	3.2 ± 3.4	1.6 ± 2.6	0.8 ± 2.0	7.78**
	Total	29.6 ±21.6	32.0 ±19.7	22.9 ±21.5	5.4 ± 3.6	8.97**
EDI	DT: Drive for Thinness	8.3 ± 7.6	10.1 ± 6.4	7.3 ± 6.6	1.6 ± 2.6	7.43**
	IN: Ineffectiveness	7.9 ± 8.4	8.2 ± 6.7	7.2 ± 7.2	1.3 ± 2.2	5.05**
	B: Bulimia	1.4 ± 3.0	4.6 ± 4.2	5.7 ± 5.4	0.6 ± 1.3	8.2**
	BD: Body Dissatisfaction	10.7 ± 7.5	15.2 ± 9.1	19.4 ± 7.8	8.1 ± 6.7	7.35**
	IA: Intero-ceptive Awareness	8.9 ± 7.9	8.2 ± 5.6	8.6 ± 7.9	2.4 ± 2.2	4.58**
	MF: Maturity Fears	2.6 ± 2.1	4.7 ± 5.3	2.4 ± 2.2	1.3 ± 1.4	4.00*
	P: Perfectionism	7.7 ± 5.1	6.7 ± 4.1	6.6 ± 5.5	2.2 ± 2.7	6.08**
	ID: Interpersonal Distrust	4.2 ± 4.8	5.1 ± 4.6	4.7 ± 4.00	2.2 ± 2.8	2.07

* $p<0.05$ **$p<0.001$

The EDI is one of the self-measure instruments most often used in eating disorder research because it does not simply assess weight, shape and dieting but also measures other psychopathological features viewed as important in the presentation or aetiology of eating disorders. Although overall well validated, studies have found that the EDI factor structure is more reliable in a patient population than in a non-patient population (Welch, et al. 1990; Welch & Hall 1988). The specificity of the EDI has also been investigated (Cooper, et al. 1985; Hurley, et al. 1990). These studies came to the conclusion that the EDI sub-scales that are not directly concerned with eating and weight related attitudes and behaviours but may reflect the general level of psychological disturbance and are not necessarily specific to eating disorders. However it has been well established that the EDI scales clearly distinguish between normal controls and those with an eating disorder. The present study confirms this by demonstrating significant differences between the groups despite the fact that the eating disordered group consisted of women with either a current or past eating disorder. In the original validation study (Garner, et al. 1983) they found clear differences between current and recovered anorexics. The mean scores of the anorexic group from the present study were between that of the current and recovered anorexic group from Garner et al's study. This was true for the eating sub-scales as well as those that do not make specific reference to eating or weight.

ANOVAs of the other standardised measures used within the study revealed highly significant differences between the four groups (see table 2). Interestingly only the weight related sections of the PARTS turned out to be significantly different between the groups with the normals reporting less teasing. Post hoc Tukey's tests revealed that the normal group was significantly different ($p< 0.001$) from the bulimic and obese group and that anorexic and obese group were also significantly different form each other. In contrast the General Appearance Teasing Scale showed no differences. In the original validation studies of the PARTS (Thompson, et al. 1991) the authors found high correlations with the Bulimia, Body Dissatisfaction, and Drive for Thinness sub-scales of the EDI with the Weight/Size Teasing Scale. Using the EDI

as a measure for eating disturbance they found that the women with eating disturbances had significantly higher scores on the Weight/Size Teasing Scale but almost identical scores on the General Appearance Teasing Scale. As described later in the section and summarised in Table 6 the informants in this study showed an identical pattern of cross-correlations between these sub-scales.

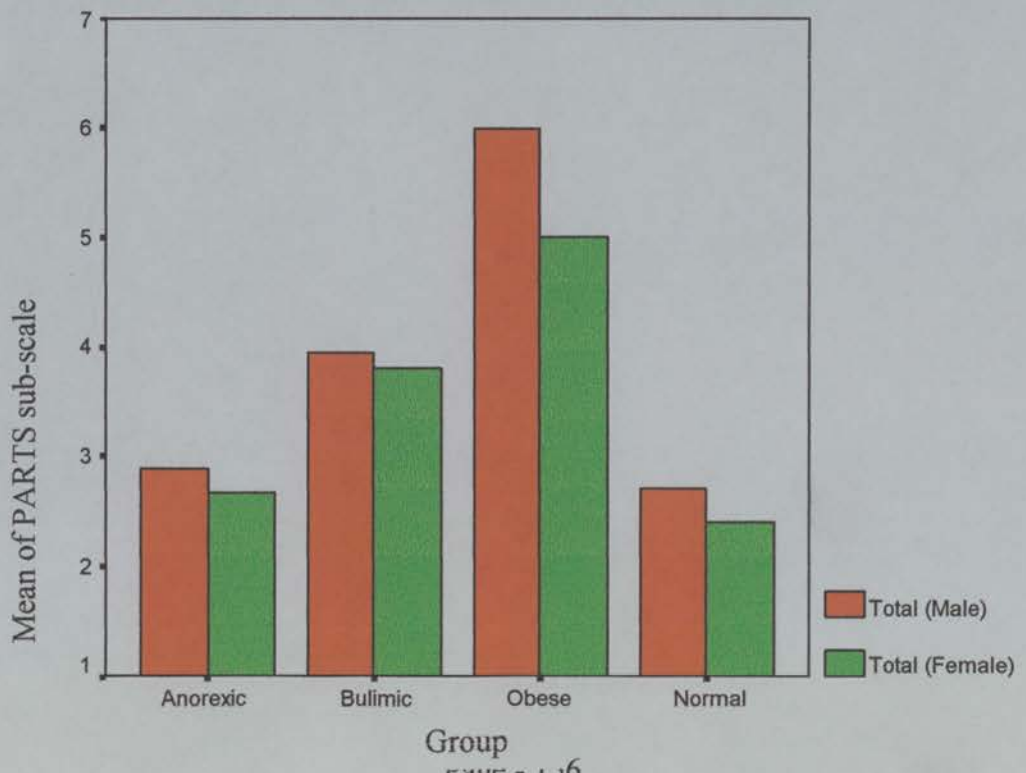
Table 2 PARTS results

One Way ANOVA

Questionnaire	**Group Mean ±Std. Deviation**				**F**
	Anorexic N=18	Bulimic N=21	Obese N=20	Normal N=20	
PARTS W/ST Weight/Size Teasing	21.6 ± 9.7	26.6 ±12.7	22.9 ± 21.5	5.4 ± 3.6	11.94**
PARTS GAT General Appearance Teasing	11.4 ± 5.1	12.6 ± 5.9	11.2 ± 4.8	11.8 ± 4.7	0.25
PARTS Female	2.7 ± 1.3	3.9 ± 2.3	5.0 ± 2.9	2.4 ± 1.4	6.29**
PARTS Male	2.9 ± 1.0	4.0 ± 2.1	6.0 ± 2.5	2.7 ± 1.3	12.8**

**p<0.001

Figure 1: Comparison of weight-related teasing by male and female family members for each group.



The original PARTS only enquired about comments by male family members but not about comments by mothers or sisters. For the purpose of this study, two questions were added to redress this imbalance; this sub-section will be referred to as PARTS female. To allow a comparison between being teased by male and female family members the two items from the original PARTS concerning comments by male family members were isolated and directly compared with the two questions added to the PARTS. This sub-section will be referred to as PARTS male. As table 2 illustrates the four groups differed highly significantly on PARTS male as well as PARTS female. Particularly obese informants reported more teasing about their shape by their family members of both genders.

Figure 1 represents the extent of teasing by female vs. male family members and illustrates that the women in all groups experienced more teasing by their male than their female family members. Significant correlations between the extent of being teased by male and female family members could be found for all groups apart from the obese group (see figure 2).

Figure 2 Scatter plot of correlations between female and male teasing from the PARTS. Separate regression lines are fitted for each sub-group.

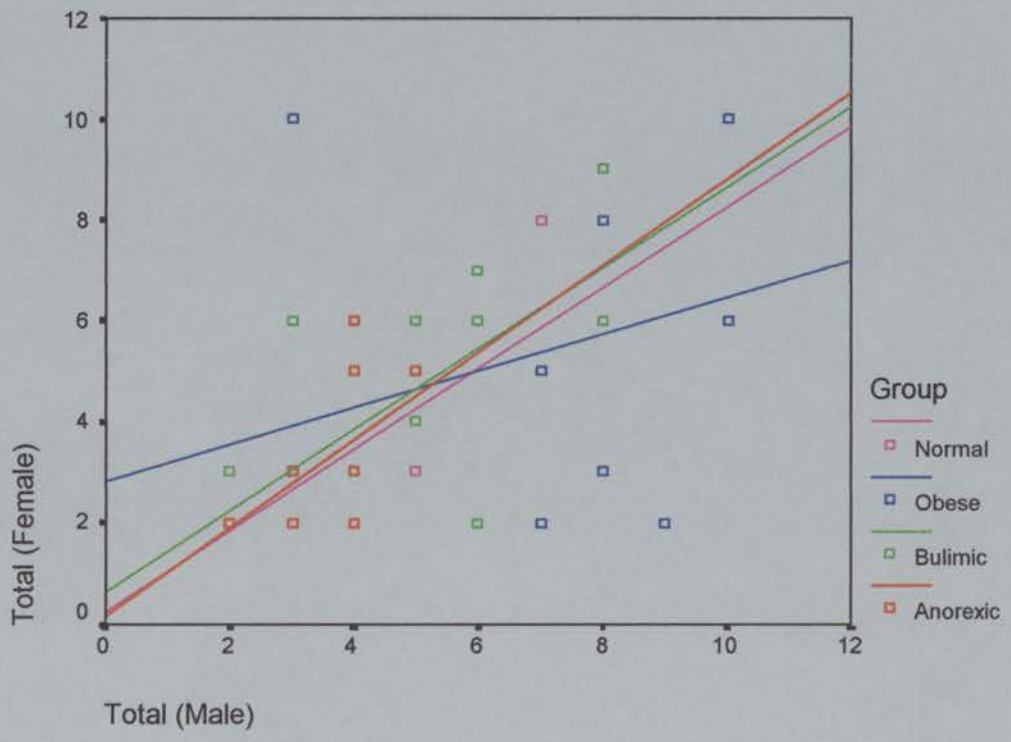


Figure 2 reveals that the regression slopes for the anorexic, normal and bulimic group are nearly identical whereas the obese group appear to be different. For the first three groups the correlations between the PARTS Male and PARTS Female scales are significant (Anorexics $r=0.687$, $p<0.01$; Bulimics $r=0.763$, $p<0.001$; Normals $r=0.794$, $p<0.001$). The obese group showed no such significant correlation ($r=0.324$, $p=0.189$). This is demonstrated by the poor fit of the regression line for this group.

The results of the analysis of the PBI are shown in table 3, all informants completed the questionnaire in regards to the relationship with their mother but only 71 (92%) of the informants (AN=17, BN=20, Obese=16, Normal=18) were able to do so in regards to their father, as some fathers were not involved in their daughters upbringing. Based on the remaining informants the comparison of the PBI results showed no significant differences between the groups in regards to their relationship with their fathers. However, both scales (Care and Overprotection) showed significant differences in the relationship with the mother. Normal and anorexic informants experienced their mothers as being more caring and less overprotective than the bulimics and obese informants did. A post hoc t-test revealed this difference to be significant ($p< 0.05$).

Table 3 PBI results. One Way ANOVA

PBI sub-scales	Group Mean ±Std. Deviation				F
	Anorexic N=18	Bulimic N=21	Obese N=18	Normal N=20	
Father Care	14.4 ± 10.0	18.2 ± 8.8	14.8 ± 5.9	19.8 ± 10.6	1.46
Father Overprotection	15.8 ± 7.8	17.4 ± 8.4	18.3 ± 7.2	14.0 ± 8.23	0.96
Mother Care	23.6 ± 11.0	17.5 ± 11.5	18.5 ± 9.5	25.5 ± 7.66	2.90*
Mother Overprotection	14.00 ± 6.7	20.5 ± 6.9	19.2 ± 9.3	13.4 ± 8.6	4.05**

*p<0.05 **p<0.01

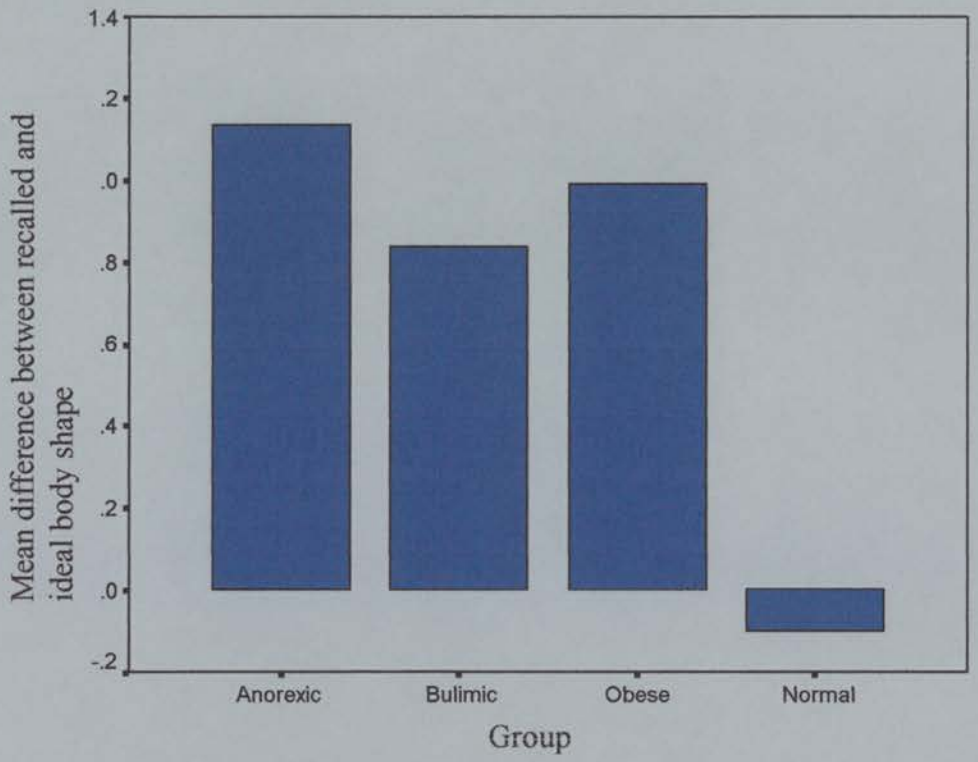
Looking at more demographic features (see table 4) the four subject groups did not differ in age or height, but highly significant differences in weight were found. Consequently the BMI's differed in the expected direction; the BMI's reflected the diversity of participating informants and ranged from 10.6 to 57.7. A post hoc Tukey's test demonstrated that the obese group was highly significantly different from all other sub-groups. Concordant with the data from the interviews, there were no significant differences in family size, number of close friends, or age of menarche. The mean age of menarche for all four groups (Anorexics 12.1, Bulimics 12.8, Obese 11.8, Normal 12.2 years) was similar to the median of 12.9 years that was found in a recent study of British teenagers (Whincup, et al. 2001). For anorexic, obese and normal group the average age of menarche was below that of average age of first diet and for bulimics it was identical. However there was a significant difference between the groups in the age of first diet with obese informants starting to diet earlier, closely followed by bulimics then anorexics and finally normals. A post hoc Tukey's test was undertaken which showed that the normal group started dieting significantly later ($p < 0.05$) than the obese and bulimic groups. Onset of dieting is of particular importance because it normally precedes the onset of an eating disorder (see also table 8) and is seen as a risk factor for the development of eating disorders (Striegel-Moore, et al. 1986). An average age of menarche of 16.1 years for the normal group seems 'old' given that other studies (Maloney, et al. 1989; Hill, et al. 1992) found dieting behaviour a common occurrence among children as young as 7 and 9 years old respectively. Possible implications of this will be discussed further in chapter 7.

To establish the informants' body shapes as children a pictorial instrument (Collins 1991) was incorporated in the interview. The informants were asked to look at seven girl figures illustrating body weight ranging from very thin to obese. They then had to decide which of the shapes was most similar to their own shape when they were at primary school age. In addition they were asked which of the shapes would have been their ideal shape as a child. Significant differences between the groups were

found with the eating disordered groups describing themselves as being heavier (higher scores represented heavier figures) than the normal group (see table 4). Post hoc Tukey's proved this differnence to be significant between normal and all other sub-groups ($p < 0.05$). In contrast, the differences between the groups ideal body shape as a child did not reach significance level.

Figure 3 illustrates the differences between actual and ideal shape as a child.

Figure 3: Difference between recalled and ideal body shape in childhood



Although the obese group described themselves as the heaviest group it is the anorexic subgroup that expressed the greatest difference between actual and ideal shape. It is also worthwhile noting that the normal group was the only one to describe a wish to be of bigger size than they were, on average. Given that the informants did not differ significantly in their ideal body shape, these differences must be due to differences in reported actual body weight.

Table 4 Demographic Information

One Way ANOVA

	Group Mean ± Std. Deviation				F
	Anorexic N=18	Bulimic N=21	Obese N=18	Normal N=20	
Age	27.6 ± 6.3	28.4 ± 5.3	30.3 ± 7.0	29.8 ± 4.0	0.88
Weight (in kg)	49.3 ± 8.2	60.8 ± 10.2	95.6 ± 19.5	61.2 ± 6.8	49.9**
Height (in cm)	163.7 ± 7.3	166.7 ± 7.4	163.4 ± 6.6	167.3 ± 6.8	1.54
BMI	18.3 ± 3.3	21.6 ± 2.4	36.0 ± 8.0	21.9 ± 2.4	54.7**
Age 1st Diet	14.2 ± 1.5	12.8 ± 2.9	12.7 ± 3.5	16.1 ± 4.3	4.03*
Menarche	12.1 ± 1.3	12.8 ± 1.4	11.8 ± 1.2	12.2 ± 1.0	2.01
Child Body Shape	4.5 ± 1.4	4.4 ± 1.0	4.7 ± 0.9	3.5 ± 0.8	4.93*
Ideal Body Shape	3.3 ± 0.9	3.6 ± 0.7	3.7 ± 0.8	3.6 ± 0.6	0.77

*p<0.05 **p<0.001

A series of correlations was undertaken to investigate the relationships between the above variables with a particular interest in the question of whether the subject's figure/shape as a child had any relation to other variables in the past or present. A significant correlation between childhood shape and current BMI ($r=0.23$; $p<0.05$) was established, i.e. the heavier the informants were as children the earlier they started to diet ($r=-0.35$; $p<0.005$). As table 5 shows the heavier children were more likely to be teased about their weight by male family members and contemporaries but the reported actual body size did not correlate with being teased by female family members. Furthermore current BMI and age of first diet correlated with being teased by female family members. The table also shows that their childhood shape didn't seem to affect the informants' relationship with either of their parents (or that this particular quality of their relationship with their parents didn't influence their weight).

Table 5 Body Shape and Questionnaire Correlations

	PARTS				PBI			
					Father		Mother	
	W/ST	GAT	Female	Male	Care	Over-prot.	Care	Over-prot.
BMI	0.41**	0.10	0.40**	0.55**	-0.06	0.11	-0.21	0.26*
Age 1st Diet	-0.28*	0.20	-0.28*	-0.37*	-0.05	-0.09	0.04	-0.11
Child Shape	0.39**	-0.08	0.13	0.23*	0.14	0.00	0.10	0.13
Ideal Shape	0.04	0.10	-0.13	0.08	0.13	-0.16	0.23*	0.02

*$p \leq 0.05$ **$p \leq 0.001$

Looking at the relationship between the questionnaires that assessed childhood experiences and those that assessed current eating behaviour it is striking to what extent being teased about their body shape as a child/teenager correlated with all sub-scales of all the eating behaviour questionnaires apart from the Maturity scale of the EDI (see table 6). In comparison with the PARTS the PBI shows less significant correlations.

Table 6 Correlations between present eating behaviour with PARTS and PBI

		PARTS			PBI			
					Father		Mother	
		Weight / Size	Gen. App.	PARTS Male	Care	Over-prot.	Care	Over-prot.
BITE	Severity	0.39**	0.15	0.17	-.025*	0.12	-0.15	0.21
	Symptom	0.34**	0.08	0.18	-0.31**	0.17	-0.20	0.12
EAT	Dieting	0.36**	0.06	0.21	-0.21	0.17	-0.26*	0.26*
	Bulimia	0.45**	0.12	0.18	-0.31**	0.24*	-0.22	0.21
	Oral Control	0.22	0.11	0.13	-0.12	-0.02	-0.17	0.07
	Total	0.40**	0.11	0.24*	-0.22	0.15	-0.31	0.24
EDI	DT	0.29*	0.01	0.07	-0.13	0.02	-0.21	-0.02
	IA	0.43**	0.20	0.30**	-0.34	0.14	-0.37**	0.10
	B	0.52**	0.03	0.28**	-0.15	0.15	-0. 23	0.39**
	BD	0.34**	0.08	0.37**	-0.08	0.08	-0.31**	0.42**
	I	0.48**	0.27*	0.40**	-0.28*	0.24*	-0.31**	0.07
	MF	0.19	0.29*	0.20	-0.08	0.08	-0.10	-0.03
	P	0.32**	0.18	0.32**	-0.31**	0.13	-0.36**	0.13
	ID	0.39**	0.24*	0.29*	-0.24*	0.28*	-0.31**	0.10

*$p \leq 0.05$ **$p \leq 0.001$

DT=Drive for Thinness; IA=Interoceptive Awareness; B=Bulimia; BD=Body Dissatisfaction; I=Ineffectiveness; MF=Maturity Fears; P=Perfectionism; ID=Interpersonal Distrust.

It is interesting that the pattern where significant or highly significant correlations were found is quite different for mothers and fathers. Whereas less paternal Care was associated with more severe bulimic aspects overall (BITE and Bulimia sub-scale of the EAT) generally maternal Care and Overprotection was more associated with dieting. Significant correlations could be found with the EAT Dieting sub-scale, Body Dissatisfaction and Interoceptive Awareness, which reflects a deficiency to accurately identify emotions and sensations like hunger and satiety. What is common for both parents is, that less perceived care by mother and father is significantly related to higher scores on the Ineffectiveness, Perfectionism and Interpersonal Distrust sub-scale of the EDI.

Although not all variables correlate significantly the trend certainly is higher eating pathology is associated with parents who are perceived as being less caring and more overprotective.

Additionally it is worth noting that some variables produced surprisingly little correlations with others. Foremost that age of onset of puberty (or menarche) didn't correlate significantly with any of the other variables. This is particularly surprising given that recent studies have consistently indicated that early menarche is associated with an increased risk of a poorer body image and increased eating problems (Graber, et al. 1999) and that girls with chronically disturbed eating patterns are more likely to be early maturers (Graber, et al. 1994). Even though eating disordered informants described being teased more for their appearance this apparently did not affect the number of close friends they had in childhood, as this is another variable, which showed little relationship to others.

Most of the data from the interview were in the form of categories, which were analysed with Chi-square tests. There were few significant differences between the four groups and this was true for all areas of the interview.

There were no significant differences in how the informants described their families in regards to closeness or general atmosphere at home during their childhood. One of the areas were the families did differ was in regards to the socio-economic status of their families. Table 7 gives on overview of the social classes represented by each sub-group. Whereas for all eating disorder sub-groups social class 2 is the most prevalent, for the normal group social class 1 and 2 are equally represented. The differences between the groups turned out to be significant ($p<0.05$) for the SES of the family of origin but not for current SES.

Table 7 Socio-economic status in family of origin and informants' current SES

Group	Family	Social Class				
		1	2	3	4	5
Anorexic (n=18)	origin	2 (11%)	11 (61%)	3 (17%)	1 (6%)	1 (6%)
	current	3 (17%)	11 (61%)	3 (17%)	1 (6%)	0
Bulimic (n=21)	origin	1 (5%)	9 (43%)	10 (48%)	0	1 (5%)
	current	2 (10%)	8 (38%)	11 (52%)	0	0
Obese (n=18)	origin	3 (17%)	10 (56%)	3 (17%)	0	2 (11%)
	current	2 (11%)	10 (56%)	6 (33%)	0	0
Normal (n=20)	origin	7 (35%)	7 (35%)	3 (15%)	3 (15%)	0
	current	6 (30%)	10 (50%)	3 (15%)	1 (5%)	0

Another area where the families did differ ($p<0.05$) was in the incidence of psychiatric disorders in the family. As table 8 demonstrates the incidence rates of having had at least one member of their family suffering from any form of psychiatric disorder ranged from 33% (normal) to 72% (obese). In contrast to this, the groups didn't vary significantly in the incidence of eating disorders within the family. For all four sub-groups they were surprisingly high with 39% for the anorexic as well as the obese subgroup, 43% of the bulimic and 20% of the normals. These high prevalence rates for psychiatric disorders and eating disorders have to be

put in perspective by the fact that the 'diagnoses' were made by the informants themselves. Consequently this does not necessarily mean that the person in question would fulfil any medical diagnostic criteria.

Table 8 Psychiatric disorders and Eating Disorders within the family

	Group				Significance (Pearson Chi-Square)
	Anorexic N=18	Bulimic N=21	Obese N=18	Normal N=20	
Psychiatric Disorder	44.4%	66.7%	72.2%	33.3%	0.029
Eating Disorder	38.9%	42.9%	38.8%	20.0%	0.429

The body shapes of the other family members are of relevance because of the potential genetic influence on weight. Interestingly there were no significant differences when asked about the weight/shape of their parents during the informants' childhood. But asked about their current weight, significant differences were found ($p<0.05$ for mothers and fathers). Whereas the majority of normals describe their parents' shape as 'normal', the eating disordered subgroups have a greater variety ranging from very thin to obese.

Eating within the family was an important area of the interview. Again, only few characteristics emerged as significant. There was no difference in the set up of meal times, nor a difference in the mood at mealtimes nor in the variety or importance of food. During their childhood the four groups describe no difference in parental concern about their own or their children's weight. Also, no differences in regards to rules about eating, food restrictions or using food as reward could be found.

In contrast to that, the groups seem to differ ($p<0.05$) in regards to the use of food as a punishment (or to be more specific the withdrawal of it as a form of punishment).

As established in the interview 33% of the anorexic, 29% of the bulimic and 28% of the obese subgroup experienced this practice occasionally or frequently but only 10% of the normal group. There was no significant difference in the extent of restrictions in regards to food between the groups, but where restrictions existed the anorexic and normals were more likely to comply with them (100% of anorexics, 92% of normals, 42% of bulimics and 46% of obese). This difference proved to be highly significant ($p<0.01$). Another area where highly significant differences ($p<0.001$) could be found was in regards to enforced dieting with none of the anorexics or normals having been forced to diet but 45% of the bulimic and 44% of the obese stating that they had been forced by their parents to diet. It seems feasible that those differences are related to the other finding that bulimics and obese informants were less likely to comply with food restrictions.

The interview included a number of questions about very early feeding and eating experiences of the informants. Due to the nature of these experiences the informants could not be expected to have actual memories of these events and therefore the direct involvement of the mothers would have been particularly valuable. Troy et al. (Troy, et al. 1996) examined the validity of self-reported birth weight and breast-feeding history. In their study 82% of their subjects answered the question if they have been ever breast-fed in agreement with their mothers' reports. Furthermore the authors found a correlation of $r=0.74$ between self-reported birth weight and state birth records. The authors therefore concluded that women could provide data on these factors with sufficient accuracy.

No statistically significant differences between the four groups in regards to birth weight or the length of pregnancy could be established. As table 9 demonstrates the groups did not differ significantly in the occurrence of breast-feeding nor did they differ in their knowledge of whether they were breast or bottle-fed. Although 91% of informants knew how they were fed only 18% ($n=14$) could give at least an indication of the duration of breast-feeding, based on this level of response no differences between the groups could be found.

Table 9 Non-significant differences in early feeding patterns

	Anorexic N=18	Bulimic N=21	Obese N=18	Normal N=20
Breastfed	8 (44%)	10 (48%)	7 (39%)	12 (60%)
Bottle-fed	8 (44%)	9 (43%)	9 (50%)	7 (35%)
Don't know	2 (11%)	2 (10%)	2 (11%)	1 (5%)

The data about the occurrence of breast-feeding was further examined; no relationship between length of pregnancy, birth weight and method of feeding could be established. In addition the factor of being mothers themselves (17% of the informants had at least one child) did not affect the knowledge about their own feeding history.

Given that not all children of the same family developed the same eating patterns the question of non-shared experiences within the family was of interest. Table 10 presents an overview how the siblings of the informants were fed (according to the recollections of the informants). Included in the table are only those informants who had at least one sibling and could make statements about their own and their siblings feeding. The table shows that in particular anorexics and bulimics were more likely to be fed differently to their siblings than obese and normal, although this difference only approached statistical significance (Chi-Square, p=0.057).

Table 10 Differences in breast feeding between siblings (excluding those without siblings or who didn't know) (Chi-Sq p=0.057)

	Anorexic N=13	Bulimic N=17	Obese N=14	Normal N=17
Fed Different	7	7	3	2
Fed the Same	6	10	11	15

Table 11 explores the intra-familial differences further by demonstrating that for the bulimic and anorexic group the way they were fed was not related to the way their siblings were fed. In contrast none of the obese or normal group who was breast-fed had a sibling who wasn't breast-fed and if one sibling was bottle-fed the others were more likely to be bottle-fed as well. A correlation between birth order and feeding method was undertaken but no significant correlations emerged. The informants themselves gave a number of reasons for the differences between their own and their siblings eating patterns including changing attitudes, adoption, medical and practical reasons etc.

Table 11 Feeding differences between informants and their siblings

Breast Fed		Anorexic N=13		Bulimic N=17		Obese N=14		Normal N=17	
		Yes	No	Yes	No	Yes	No	Yes	No
Sibling	Yes	3	3	6	3	6	3	11	2
	No	4	3	4	4	0	5	0	4

Fed the same Fed differently

Asked about early feeding problems, food fads and favourite foods, no statistically significant differences between the four groups became apparent. To investigate food aversions in childhood, the informants were asked if they 'hated' any food as a child, subsequently the informants were asked about specific categories like fish, canned food, vegetables, etc.

Table 12 Food aversions in childhood

Food Aversion	Anorexic N=18	Bulimic N=21	Obese N=18	Normal N=20
Shellfish	4	5	4	4
Drink	3	3	8	6
Vegetable	11	12	13	15
Meat	11	10	12	12
Sauce	3	2	4	1
Canned Food	2	2	1	2
Other	6	8	8	10

As table 12 shows the groups didn't differ significantly in their aversions to specific foods in childhood and an ANOVA was performed to establish that also the overall number of food aversions did not differ significantly ($p=0.31$). The parental responses to early eating problems or general satisfaction with their children's food consumption also did not vary significantly between the four groups.

Looking at the issue of body image, it became apparent that the three eating disordered groups described themselves as being less satisfied with the way they looked as a child. They were more often criticised by their parents for their appearance ($p<0.05$). 17% of the anorexics, 43% of the bulimics and 44% of the obese stated that they were often or almost all the time criticised by their parents for their appearance whereas only 10% of the normals experienced this. This difference was not found in relation to their schoolmates or other children, where teasing or being criticised for the way they looked didn't differ significantly. The closer analysis of the open questions will give some indication about the content of the criticisms, but it is worthwhile noting that when the informants compared themselves with their contemporaries the eating disordered groups didn't feel different in height, femininity, attractiveness, for example, but only in weight. The eating disordered

groups were (or felt) significantly heavier than the normal informants did ($p<0.001$). Asked about the incidence of eating disordered behaviour amongst their friends it became apparent that dieting wasn't different across the groups but more pathological practices like bingeing ($p<0.005$), induced vomiting ($p<0.01$) or general eating disorders ($p<0.05$) were all significantly more prevalent amongst the friends of the eating disordered group.

Part of the interview was questions about the history of the informants' eating disorder. Given that the normals by definition didn't have such a history the following paragraph presents a summary of the data for the three eating disordered groups.

Table 13 Comparisons of Eating Disordered Groups
One Way ANOVA

	Group Mean ± Std. Deviation			F
	Anorexic N=18	Bulimic N=21	Obese N=18	
Age Concern	13.3± 2.9	11.7± 2.7	11.1± 4.1	2.134
Duration (in months)	109.1 ±77.3	133.7 ± 67.8	194.1± 116.0	4.273*
Age Binge	18.8 ± 5.1	18.0 ± 3.8	12.8 ± 3.2	8.7**
Age Vomit	17.6 ± 2.2	18.5 ± 3.7	17.9 ± 5.5	0.19
Age Pills	20.5 ± 5.7	19.3 ± 3.4	15.5 ± 3.9	3.18

As table 13 shows the obese sub-group was the youngest to be concerned about their eating followed by bulimics and then anorexics. Related to this variable is the duration of the eating disorder. The obese informants described the longest mean

duration of eating problems of more than 194 months (16 years). Post hoc Tukey's test demonstrated that the obese group was in this aspect significantly different ($p< 0.05$) from the anorexic group but not form the bulimic group. Looking at the table it seems that the different forms of eating disorders progress in different ways. For example, anorexics started to induce vomiting on average before they binged or took diet pills or laxatives, whereas the obese described years of bingeing before they took diet pills or laxatives or finally induced vomiting. Of course not all informants experienced all of these symptoms and the mean age of onset is based on those who stated that they had experienced a particular symptom. A highly significant difference ($p<0.001$) was in the area of bingeing with 100% of the bulimics, 72% of the obese and 50% of the anorexics describing this symptom. Also, the prevalence of induced vomiting differed significantly ($p<0.005$) with 91% of bulimics, 50% of anorexics and 39% of the obese group having used this method as a way to control their weight. The interview also enquired about treatment for their eating problem. Whereas only 53% of the obese informants stated that they had received treatment 83% of the anorexic and 85% of the bulimic informants were currently or in the past in treatment. A chi-square test showed this difference to be significant ($p\leq 0.05$).

6.2. Comparison between women with eating problems and those without

The second hypothesis of the study concerned the question of whether there are common factors where women with eating problems are different from women without such problems.

To test this hypothesis the four groups were collapsed into two subgroups (normal vs. eating disorder) and t-tests were performed for the analysis of the questionnaires and numeric variables from the interview.

Unsurprisingly the t-tests of the eating behaviour questionnaires confirmed the previous results of the four-group comparison. As before, highly significant differences in all eating related questionnaires were found with the eating disordered informants scoring higher on all subscales.

Table 14 presents the results from the comparison of those with a history of any eating disorder against the normal group using t-tests. From the PARTS only the weight / size related and teasing by male family members subscales were significantly different between the groups. In other words the eating disordered informants describe being more often teased about their shape but not other aspects of their appearance. As was found with the four-way ANOVA, the PBI scores for the relationship with the mothers were significantly different, with the eating disordered informants remembering their mothers as more overprotective and less caring than their normal counterparts. In contrast the PBI for the relationship with their fathers did not show this difference, consistent with the comparison of the four sub-groups.

Table 14 Comparison of PARTS and PBI for women with and without eating problems

		Eating Problems N=57	Normals N=20	T – test
PARTS	Weight / Size	27.6 ± 12.4	5.4 ± 3.6	4.17**
	Gen. Appearance	11.8 ± 5.2	11.8 ± 4.7	0.01
	Male family	3.9 ± 2.4	2.4 ± 1.4	2.55*
PBI	Father Care	15.9 ± 8.5	19.8 ± 10.6	-1.57
	Father Overprotection	17.1 ± 7.8	14.0 ± 8.2	1.45
	Mother Care	19.8 ± 10.9	25.5 ± 7.7	-2.16*
	Mother Overprotection	18.0 ± 8.0	13.4 ± 8.6	2.19*

*p<0.05 **p<0.001

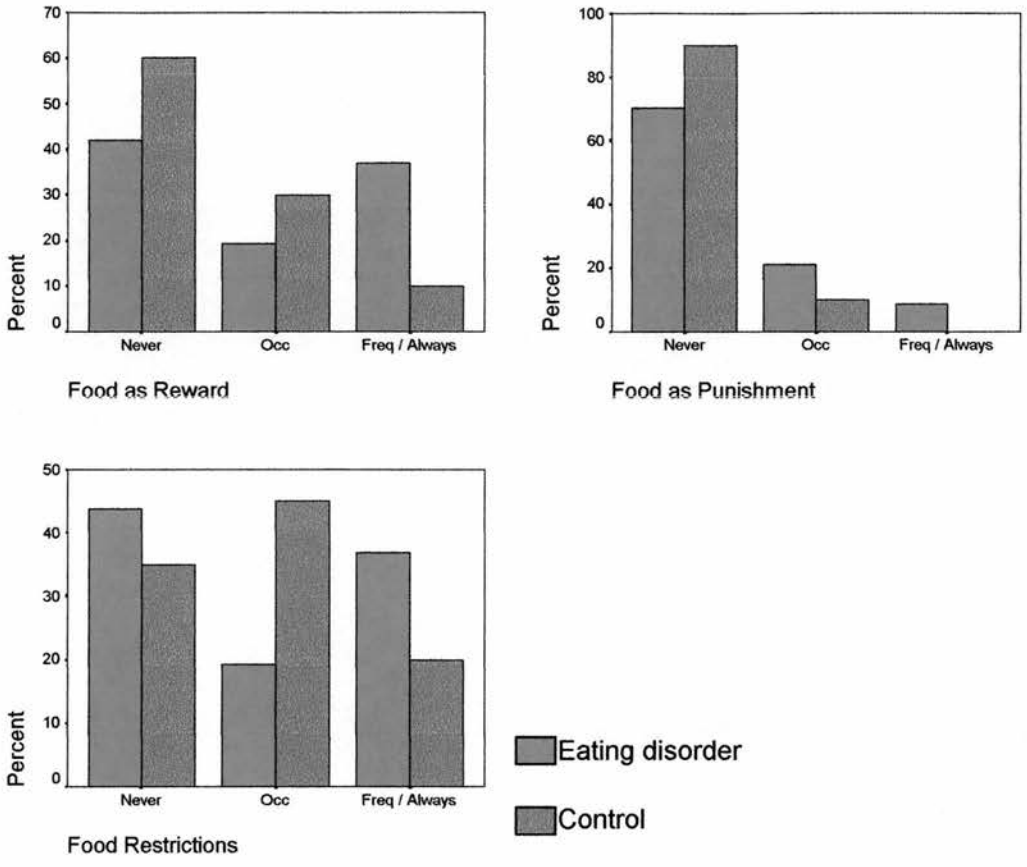
No significant differences in age, height or weight at time of interview could be found. In the eating disorders group the lower weight of the anorexic subgroup was counterbalanced by the higher weight of the obese subgroup. Chi square tests didn't

show any significant differences for other aspects of their current situation (for example in the eating disordered as well as in the normal subgroup the majority of informants were single and had no children).

When the four sub-groups are collapsed into 2 groups very few additional categorical data were significant on Chi-Square tests besides those already showing significant differences between the four sub-groups. One of the differences, which was significant, was the higher prevalence of psychiatric disorders in the family of origin (eating disorder 61% vs. normal 30%), again this difference cannot solely be explained by a higher prevalence of eating disorders (40% vs. 20% for the normal group) because this difference is not significant. In regards to eating within the family, no significant differences in the shapes/figures of the parents, variety or importance of food, or parental concerns about the child's weight could be found. Asked about their mothers concern about their own weight, 30% of the eating disordered group felt that their mothers were extremely or very concerned about their weight whereas none of the normals stated this ($p<0.05$). Despite this finding there was no difference in the prevalence of maternal dieting.

No significant differences could be found in regards to the existence of rules about food and eating, or the use of food as a reward or punishment (see Figure 4). The bar charts also show that in regards to restrictions the eating disordered group demonstrated more of an 'all or nothing' pattern. In comparison to normal women the eating disordered women were more likely to have either no food restrictions or to experience food restrictions frequently, however this tendency did not reach significance level.

Figure 4: Family restriction of food or use as reward or punishment



As expected, the dieting behaviour of the groups differed significantly with 91% of the group with eating problems having tried to diet whereas only 70% of the normal group had done so ($p<0.05$). Asked about enforced diets as a child, a highly significant difference could be found ($p<0.01$) with none of the normals having experienced this but 30% of the eating problem group stating that they had been forced to diet. It is possible that it is the area of enforced diets that is partly responsible for significant differences in compliance with food restrictions. 92% of the normals went along with existing restrictions but only 55% of the eating problem group did so ($p<0.05$).

Rather surprisingly some of the significant differences were in the area of early eating problems, with the normals reporting more early feeding problems. Food related allergies were present in 25% of the normal but only 5% of the eating disordered group ($p<0.01$). Colic was present in 25% of normals and only 7% of

eating disordered informants ($p<0.05$). In contrast to this finding, other more behavioural feeding problems like food refusal, picky eating or parental satisfaction with what and how much the child was eating did not differ significantly. As these questions partly referred to very early eating experiences the informants were likely to report what their parents had told them. No early feeding/eating problems could therefore indicate that there were indeed no such problems or alternatively that the parents didn't incorporate any problems that existed into family anecdotes. Bruch (Bruch 1974) specifically mentions that in her clinical work she noted that the parents of anorexic patients did not have 'richness' in their description of their daughter's eating pattern as a child. As in the four group comparison other aspects of early eating like the occurrence of breast feeding, food likes and dislikes did not differ significantly.

Table 15: Early feeding problems

	Eating Problems	Normal
Allergies	3 (5.3%)*	5 (25%)*
Colics	4 (7.2%)*	5 (25%)*
Food Refusal	1 (1.8%)	2 (10%)
"Picky" Eating	11 (19.3%)	2 (10%)

* $p< 0.05$ on Chi-Square test

As before, the normals reported their parents as significantly less critical in regard to their physical appearance than their eating problem counterparts ($p<0.05$). Being teased about their appearance by their contemporaries often or almost all the time occurred in 51% of eating disordered informants but only 25% of normals described this ($p<0.05$). In regards to their own evaluation of their appearance, in comparison to their contemporaries the two groups did not differ apart from weight. Whereas the majority (85%) of normals perceived themselves as lighter or the same weight as their contemporaries, the majority (77%) of eating disordered group perceived themselves as being heavier ($p<0.001$). They were also significantly more likely to have friends who induced vomiting or had a form of eating disorder.

For inclusion in the study, the informants were not divided into previously or currently having an eating problem. The scores of eating disorder questionnaires used are obviously an indication of the informants' current state, particularly given that EAT, BITE and EDI claim that they are sensitive to changes and use recovered subjects in their validation studies. A cut-off score of 30 has been described for the EAT to indicate 'caseness' (Garner & Garfinkel 1979). A combined score of 25 or more for the BITE has been reported to indicate binge eating (Henderson & Freeman 1987). In the validation study of the PARTS, the authors used the Drive for Thinness sub-scale of the EDI to distinguish between subjects with an 'eating disturbance' and those without (Thompson, et al. 1991). A 'cut-off score' of 15 was chosen to classify the eating disturbed group, as this was the mean score of the female anorexic group in the validation study of the EDI (Garner, et al. 1983). For the present study these cut-off scores were utilised and the subjects were accordingly split into high vs. low scorers, with high scores indicating the existence of a current eating disorder. Table 16 summarises the results of t-tests for the PBI, PARTS and child figure ratings. Although some of the differences turned out to be significant or even highly significant, overall the existence of a current eating problem produced less significant differences than classification on the basis of a history of past or current eating problem.

Table 16 Comparison of high vs. low scorers of the eating behaviour questionnaires

		BITE		EAT		EDI (Drive for Thinness)	
		High N=22	Low N=55	High N=22	Low N=55	High N=13	Low N=64
PARTS	W/S T	30.2	22.1*	29.8	22.3	27.8	23.6
	GAT	12.4	11.5	12.5	11.5	11.3	11.8
	Female	4.1	3.2	4.0	3.3	3.7	3.4
	Male	4.5	3.6	24.2	3.7	3.8	3.8
PBI	Mother Care	19.3	22.3	18.0	22.6	16.6	22.2
	Mother Overprotection	19.2	15.7	20.4	15.3**	18.6	16.5
	Father Care	12.1	18.8**	15.3	17.6	14.4	17.4
	Father Overprotection	18.1	15.6	17.4	16.0	16.0	16.4
Body Shape	Child	3.6	3.0	3.6	3.0	3.8	3.8
	Ideal	3.3	3.6	3.4	3.6*	3.3	3.6

* $p \leq 0.05$ **$p \leq 0.01$ For t-test comparison between high and low scores

6.3. Summary of Quantitative Results

To briefly summarize the results of the quantitative analysis, the eating behaviour questionnaires were highly significantly different with the normal group consistently demonstrating the least pathological behaviours and attitudes related to eating. Questionnaires assessing the relationship with the informants' parents showed only significant differences for the mothers, with bulimics and obese women describing their mothers as being less caring and more overprotective than the other subgroups. Childhood teasing in regards to weight or shape seemed to be of particular importance to the groups with eating problems. It was correlated with childhood shape as well as current BMI and nearly all subscales of the eating behaviour

questionnaires. Most of the data from the interview was in the form of categories, which were analysed with Chi-square tests. Overall there were few significant differences between the four groups, but eating disordered women had a higher prevalence of psychiatric disorders in their family of origin and a greater range in parental weight or shape. The families of the four groups didn't differ in most aspects concerning food and eating. Particularly interesting was the response to rules/restrictions, with obese and bulimics being less likely to comply. This might be associated with the finding that these groups more often reported that their parents forced them to diet. The eating problem groups described themselves as being heavier in their childhood and more dissatisfied with the way they looked. Finally they were also more likely to have friends with pathological eating behaviours.

7. Qualitative Data

So far the presentation of the results has focussed on the quantitative analysis of the data generated, the following part will therefore concentrate on the qualitative parts of the study.

The qualitative data within this study derived from a semi-structured interview, which was conducted with the informants. As Fontana and Frey argued 'Interviewing is one of the most common and most powerful ways we use to try to understand our fellow human beings.' (Fontana & Frey 1994, p. 361). Of course, exploring and attempting to understand the links between early eating behaviour and later eating problems was the main purpose of this study.

A semi-structured interview was constructed instead of solely relying on previously standardised measures for several reasons. Firstly there was no published and well-validated existing questionnaire concentrating on exactly the areas I wanted to explore within the study. There are a number of such questionnaires and structured interviews to assess parent-child relationships or family interactions (Waller, et al. 1990; Arrindel, et al. 1983). What these measures have in common is that they concentrate on specific aspects like parental control or affection, cohesion, conflicts, adaptability, etc. But although the general style of parenting is reflected in children's socialisation in regards to food and eating there are potentially other factors involved. Knowing that parents are over-controlling doesn't give information about the atmosphere at mealtimes or what rules existed about eating within the family.

Secondly, an interview allows more flexibility to respond to issues arising within the assessment situation. As previous research has argued, a semi-structured interview allows the kind of flexibility, which is required for exploratory and confirmatory research (Harris, et al. 1986). Furthermore, others have also reasoned that interviews or qualitative measures were particularly suited for the field of eating disorders as it

is a complex field and many areas are difficult to define (Cooper & Fairburn 1987). They pointed out that individuals with eating disorders have different norms concerning food and eating than those without. This difference could lead to distortions of questionnaire results. More recently it has been argued that norms of eating are often constructed in relation to restricted eating practices and that they are part of an interaction process to account, justify or explain one's own or others eating behaviours (Wiggins, et al. 2001).

Another advantage of combining quantitative and qualitative data lies in the so-called triangulation of measurement, which allows the researchers to have greater confidence in their findings because they derive from more than one method of investigation (Bryman 1992). The idea of triangulation however does not imply that in the case of inconsistent results one should opt for one or the other, instead discrepancies can be seen as fruitful areas of new enquiry. As Kumar summarised it 'when both quantitative and qualitative approaches have a common aim, the best way is to view each of them as complementary to the other and not as adversaries.' (Kumar 1998, p. 226).

In recent years an upsurge in enthusiasm for the use of qualitative research methods has been observed and consequently the issue of standards or guidelines for publications of such studies has been raised (Yardley 2000; Elliott, et al. 1999; Naidoo & Orme 1998). Some problems surrounding the acceptability and evaluation of qualitative research methods are partly due to their relative novelty as a psychological research tool but also to the ethos of subjectivity and flexibility that underpins most qualitative research (Yardley 2000). Nevertheless, tentative guidelines have been presented (Yardley 2000; Elliott, et al. 1999) and in the following presentation of method and data I will try to follow these guidelines where possible.

Within these guidelines the issue of the role of the interviewer him- or herself is raised and the owning up to one's perspective is demanded. Feminist approaches

have pointed out the importance of gender issues within the interviewer-interviewee relationship and Oakley expanded this by criticising that personal or social characteristics of the interviewer were usually not reported which further emphasised the hierarchical structure of most research (Oakley 1981). The following information about myself as the main researcher is a response to this criticism. All of the interviews were conducted by myself, which meant that the interviewer as well as the interviewees were female. Like most of the participating women, I am white and within the same age range as the interviewees. Before commencing the present study I worked in a psychiatric hospital where I was doing research as well as clinical work with eating disordered women. Within that research I have used interviews extensively; in fact the current study was inspired by the comments of bulimic women in a previous follow-up study. Those interviews were the starting point for the current study as many of the women mentioned that they believed their upbringing and socialisation in regards to food was to 'blame' for their disorder. It seemed only logical to me to use the tool of interviews again to further explore this area.

The interview itself was constructed along in keeping with previously published recommendations (Brewin, et al. 1993) to increase the reliability of retrospective data. It therefore asked for a range of specific events rather than universal statements about attitudes towards food and eating. The same recommendations suggest that questionnaires have been successful measuring global attitudes but that semi-structured interviews are the method of choice to assess specific childhood experiences

The analysis of the qualitative data required several steps. Firstly, I created summaries for all informants containing their answers to the open questions as well as additional comments or explanations they had given in response to the closed questions (some examples of the summaries are included in the appendix). These summaries were entered into a software programme (NUD.IST®) specifically designed to aide qualitative research. Richards & Richards stressed the advantages of

using this particular programme for qualitative research because it not only facilitates the management and organisation of the data but also supports the development and testing of hypotheses (Richards & Richards 1994). With the help of NUD.IST® a category system was developed and the text passages linked with these categories were compared.

In the following sections the results of these comparisons will be presented. During the comparison process a number of themes emerged and the presentation of the results will be structured accordingly. These themes were:

- Positive and negative food memories
- Control
- Body Image
- Early Eating
- Eating Disorders

7.1. Control

The issue of control has been an important one in the research and treatment of eating disorders. Consequently the comments of the four groups in regards to this topic were examined and compared. Even an initial look at the interviews revealed that 'control' featured much less often in the interviews with the normal women than it did in the eating disordered groups. The informants with eating problems more often expressed that they experienced their parents as controlling and/or that they felt out of control concerning their own eating and dieting patterns.

Mealtimes were, for many informants, times they spent with their parents and therefore a good opportunity to investigate parental control. From each group a number of women described an oppressive atmosphere, although it was least common amongst the normal group. The following examples from each group are meant to illustrate what was coded as oppressive:

'Me and my five siblings grew up in a children's home. The mealtimes were strict and stressful. Chocolate biscuits were only for visitors and we would get smacked if we ate one. I was force fed between the ages of 2 to 12. With 14 I had my first fish supper in the sitting room with the fish wrappers on my knees- that was great.' (N14).

'Before I went to boarding school I had dinner with nanny in the kitchen, it was nice and cosy. After dinner I would join parents in the dinning room. They liked to be posh and pretentious. On weekends I ate together with nanny and parents- 'children should be formal and well mannered'. Good manners were important and I was not allowed to leave anything on my plate. My parents were strict and I was not allowed to get up before my plate was empty.(...)My memories are split in 'hidden pleasures' when eating with nanny and stressful when things had to be formal .My father made me eat canned peas and I had to throw up in front of guests' (AN3)

'Very tense atmosphere during meals. My parents had a shop and when I was hungry I would just take what I want. But my parents were very restrictive about eating and wanted me to lose weight. The whole family worked with food. My mother would sell all the food even if there was nothing left for the family to eat, so my father would hide some food. We weren't allowed to throw anything away and parents always argued over dinner. Mother would either restrict my food or force me to eat according to her mood.'(BN13)

'The whole big family ate together. You had to eat what you were given, no pudding if you don't eat your main course. You had to sit at the table until food was cold and being told about thousands of starving people. If I was hungry I would steal money to buy sweets. Any fattening food was restricted by my mother who also dictated the amount you ate 'You can't be hungry-that's plenty" (O11)

The descriptions of eating in the family also address other areas of control, namely rules and restrictions. In all groups the rule 'clear your plate' was the one most prevalent (with 7 of the normal, 12 of the anorexic, 11 of the bulimic and 5 of the obese women describing it in one form or another). Comparing the groups it seems that the anorexics described the most controlling family environment with most oppressive meal situations, most rules concerning food and eating and generally fairly strict parents. They were the only ones to describe very formal meal set-ups (see also AN3's description of the nanny-parent situation) with a focus on good table

manners and no talking at the dinner table. I should add at this point that they were also the group who most often mentioned dichotomous meal situations where meals were more informal/better when certain persons (most often father) were not around. Another women who depicted that poignantly was AN1 who described it as follows:

> *'Normally we children would eat together, which I enjoyed. Parents ate later and something different. It was a nightmare if the whole family ate together, we would eat as quickly as possible to get away from the table. A very tense atmosphere. Father forbad children to eat anything between meals, hypocritical because he would do it himself. Butter was only for my father, we had to eat margarine. (...) Not allowed to leave the table before you finished. My father was very strict and shouted a lot, would serve leftovers the next morning. Mother was relaxed but scared of father. Meals with father were very tense, I felt sick and didn't want to eat in his presence.'(AN1)*

In contrast to that, the members of the obese group described the fewest rules and the least strict environment. But where this group experienced most control was in the area of food restrictions, specifically the quantity of food or frequency of snacking. In comparison with the other groups, the parents of obese daughters were most likely to restrict sweets, junk food, or generally 'fattening' food. As already found in the statistical analysis, placing restrictions on their daughters food consumption didn't necessarily mean that the informants went along with those restrictions. Mainly bulimic and obese women reported secretly eating sweets and even stealing the money or sweets to do so.

> *'I felt watched for how much I ate. Felt out of control, hungry and attacked. The rules were: no sweets, no seconds, no midnight snacks. When I was 'bad' pudding or other sweet things would be withheld (...) Many foods were restricted, everything high in sugar, high in carbohydrates or fatty. That was meant to control my weight. I would go along to a certain point and then I would steal money to buy food. (...) The kitchen door was locked at night and there were 20 diet books in the kitchen. (O17)*

On the bases of the interviews it seems that the parents implemented most of these restrictions because they were dissatisfied with their daughters weight or shape, which leads us to the next section: body image.

7.2. Body Image

Negative comments about weight were one of the subject matters, which turned out statistically significant differences in the questionnaires, as well as in the interview. A closer look at the answers to the more open questions provided further information not only on the extent but also on the content of these comments. To some extent guided by the PARTS questionnaire, the interview statements were coded into negative comments about being overweight and negative comments about other appearance related issues, and furthermore differentiated between comments being made by parents and those made by other people

Table 13 Interview statements about teasing in childhood

	Normal	AN	BN	Obese
Happy with own appearance	6	5	5	6
Unhappy with certain body aspects	6	4	4	7
Unhappy because felt too fat	2	4	3	11
Teased by mates about being fat	4	11	9	9
Teased by mates about other issues	5	6	4	6
Teased by parents about being fat	0	3	9	8
Teased by parents about other issues	7	1	3	2

Across the four groups a similar number of women stated that they were happy with their appearance as a child and this was expressed in statements ranging from *'I looked ok*' to *'As a child I thought I had the prettiest face in town...*' (O3). They were also similar in their dissatisfaction with appearance related issues other than feeling overweight. Not unexpectedly, a wide spectrum of 'deficits' was recalled with being flat chested or too tall being the main issues. I could not detect major differences in their responses. Obviously being flat chested is more an issue of puberty and

although the interviewees were specifically asked about early comments about their appearance, negative comments in particular often related to this period in life.

In distinction to the above findings, the feelings/statements about their dissatisfaction with their weight were more varied. Whereas only two informants from the normal group mentioned their weight as a problem, more than half of the obese did so. It was also interesting to see the way they expressed their dissatisfaction. In particular, obese and bulimic women used terms expressing hate or disgust about the way they looked.

> *'That I hated the way I looked, was always in the back of my mind. When I was 10 I was in hospital with pneumonia and lost a lot of weight. All the nurses complimented me on how thin and lovely I looked now.'(BN16)*

> *'I hated the way I looked. Always got comments like 'You look pregnant in that' or 'God, you look such a mess'. (O17)*

The above two examples also underline the relationship between the way they felt about themselves and comments made to them. In the interviews it was sometimes astonishing with what vividness the informants remembered statements or episodes, which happened ten or even twenty years ago. As the above table shows normal and eating disordered women endured a similar amount of teasing in regards to other appearance related issues (a category which overlapped somewhat with being unhappy about these deficits) but the normal group were less often teased about being overweight. Most of those comments were in the form of being called fat, fatso, fatty etc. Some women described more specific memories like:

> *'My first memory is being called fat over school dinner. From then on I always hated PE because I had to wear shorts.' (BN12)*

> *'At 10, a boy talked about me and said 'Does she walk or does she roll?' (O6)*

Another comment that fell into this category also illustrates how experiences and reactions can change over time:

'When I was 11 people would say what a beautiful girl I was. At 12 a boy called me 'CITG' (crater in the ground). When I was 14 and people made compliments I told them to fuck off.' (BN3)

Looking at the same categories for parental negative comments it was evident that more normals remembered negative general comments from their parents than was the case with the eating disordered groups. But a closer inspection of these comments also showed that these comments - although probably annoying for the informants - were of a fairly 'harmless' nature. For example:

'When I was young I had red hair, the family found it beautiful. Only criticism as a teenager when I dyed it blue.' (N2)

'Dad didn't like it when I didn't stand straight. He would call me 'Bow leg M.' (N11)

None of the normals mentioned any negative comments from their parents about being fat, but the bulimic and obese groups, in particular, did. Also, in comparison to the above comments some of these criticisms seemed more detrimental:

'Feeling embarrassed about eating in front of others-' no wonder you are the size you are'. Mother said ' You are Bob's sister No Hope', because I never stuck to a diet. Mother knocked me constantly.' (O6)

'Memories of mother saying: "A. if you eat any more of this you'll look like the end of two buses instead of one."' (O17)

'Father said I was disgustingly fat with disgusting thighs.' (BN12)

Not all of the comments were that condemning and a number of informants just stated that one or both of their parents said they were too heavy or should lose weight. Asked for any comments about the way they looked as a child, many informants could also remember praise or positive remarks. Sadly even when they remember these positive remarks the informants usually added that things changed. This might reflect a parental opinion that it is okay, or even desirable, to have a big baby or a chubby child but that for teenagers different standards are accepted.

'I was a 'wee plumpy'- my mum thought that was great. (AN12)

'As a child I was satisfied with my body. Parents and grandparents called us 'beautiful children'. As a teenager mum told me I needed to go on a diet and compared me and my sister a lot.' (BN5)

Overall the eating disordered groups recalled more negative comments and teasing about being overweight than the normal group. This was particularly true for the overweight group, which was also the group that most disliked their bodies in childhood. Additionally, I identified qualitative differences in the parental responses with bulimic and obese women remembering very condemning remarks from their parents more often.

7.3. Positive and Negative Food Memories

The following section will investigate the interviews in regards to positive and negative memories associated with food and eating. Table 14 gives a brief overview of how often the four groups made any statement falling into the relevant categories.

Table 14 Positive and Negative Food Memories

	Food Itself		**Meal Atmosphere**		**Food Preparation**	
	Negative	Positive	Negative	Positive	Negative	Positive
Normal	3	12	6	10	2	4
AN	2	7	9	6	2	3
BN	4	12	6	8	4	7
Obese	1	10	5	5	0	0

The category 'food itself' contained statements concerning the quality of the food offered as well as the reactions to it. As positive memories, I coded statements which associated food with positive characteristics like 'delicious', 'variety', 'cooked well' etc.

'Happy memories. I was allowed to pick myself the piece of meat I wanted to have from the roast on Sundays. Mother would bake cake, I always enjoyed that and ate four pieces.' (N8)

'Mum was a fantastic cook, wonderful food. ' (AN12)

'My mother always cooked what we children wanted. We would eat different meals and Mum cooked it all. I grew up in Asia and always loved food. (...) My mother was very flexible about eating, we looked forward toward mealtime. (BN3)

In contrast to these pleasant memories negative memories were defined by using negative terms for the food like 'dull', 'overcooked', 'disgusting' or negative reactions to it. I also used this category if watching somebody else eating provoked negative emotions.

'Mother appeared always stressed because she had little time to prepare food. We usually had stews, which I didn't like. The food was always too fatty and had a funny skin.' (N17)

'My mother bought sweets for herself but none for us. We kids watched her eating them - I hated my mother for that. Got leftovers from her work. Always chips or potatoes, always the same food.' (O15)

'The roast pork had fat on the side, had to eat the fat. I was disgusted and had difficulties swallowing it.' (BN16)

Comparing these two sub-categories it was apparent that the number of positive memories outnumber the negative memories of food itself for all four groups. It was also evident that the anorexics had markedly fewer positive memories relating to food itself. However, due to the retrospective nature of the study it wasn't possible to determine if they had in fact 'less good' food or if their eating disorder biased their recall. It was also interesting to see that overall the descriptions of positive food memories were shorter and less vivid. Informants often used only terms like 'quite pleasant' or 'nice food'. In contrast to that, the negative food experiences were more often in the form of anecdotes or very specific events.

A positive or negative memory of food and eating in childhood is not only determined by the quality of food offered but also by the setting or the overall atmosphere in which food is consumed. I therefore examined the atmosphere during mealtimes and for this purpose concentrated on 'positive' vs. 'negative' atmosphere.

The first category was defined as a pleasant experience, meals were regarded as positive family occasions and the following statements are examples of that.

> *'We ate as a family. We were six kids; they were noisy, happy times and a chance to talk about things. (...) Positive memories of sitting around the table. Birthdays were special and food always played an important role. (N11)*

> *'Quite happy meals. I used to love her food.' (AN12)*

> *'All were sitting around the table, good time. The kitchen was the centre of family life. Very relaxed, you could eat as much food as you liked. Memories of not wanting to eat a proper breakfast. I only ate the egg yolk and would crack the egg open on my father's head. Advent was celebrated with massive breakfast that lasted a couple of hours. Remember one holiday in Austria where we would eat out in restaurants and my sister and I had every day a schnitzel.' (O3)*

In contrast, a negative atmosphere was defined as being tense, stressful, or an opportunity for arguments. As the following examples illustrate, a tense or stressful atmosphere was often interwoven with negative memories of the food itself.

> *'For the first years father was a househusband and mother always criticised his cooking. Parents would use mealtimes to discuss problems at work etc. Never talked about children's issues. (...) Father always talked about his work problems at the table, dumped his rubbish on us.' (N12)*

> *'Mealtimes were not particularly pleasant; I always had to finish what was on my plate. At school I was picked on because I was vegetarian' (O9)*

> *'Family never ate together. I would have a meal in the kitchen, others would have it in the lounge, I felt conscious about eating. I felt repulsed by my father's eating. Mother never sat down to eat but picked on different foods. Parents didn't have rules about eating, but granny would get angry and tell*

mother that she was wasting money and that other children would be grateful.' (BN10)

'Meals were very tense. My brother always got into trouble at school, which led parents to be in a bad mood. Parent's attitude was: eat what you are given, food costs money and vegetables are good for you. Memories of nobody sitting down for breakfast, pretty hectic, always rushed. We didn't seem to talk much over dinner. Dinner was the only time I was in the same room as my father. ' (AN9)

Whereas in the case of food itself, the positive memories (at least numerically) outweighed the negative, in the case of atmosphere the relationship was less clear-cut. The anorexics were the only group who recalled a negative atmosphere more often, in the obese group it was balanced, and bulimics and normals described a positive more often than a negative atmosphere.

The last category in this section concerns food preparation (including gardening, shopping, baking, cooking) and I differentiated the categories depending on whether these tasks were regarded as chores or pleasurable activities. First of all, it was noticeable that the obese informants didn't mentioned this area at all, something, which had escaped my attention during the interviews. It gives almost the impression that food was just 'there', dished up or alternatively stolen or secretly eaten. In contrast to that, bulimics most often referred to food preparation and they had more positive memories related to this, for example baking a cake with their mother, or remembering being 'experimental' in the kitchen.

To summarise the findings in this section, all four groups had more positive than negative memories of food itself, although negative experiences seemed to be more vividly remembered. Overall the normal group had the happiest memories of food and eating, whereas the anorexic group has the fewest positive memories.

7.4. Early Eating

Given the subject of the thesis, I was particularly interested in the informants' early eating patterns and consequently tried to obtain information about their early eating by asking what their families told them about it. Of course there is an overlap with issues like control or negative/positive memories. The following section will therefore concentrate on aspects of early eating, which haven't been yet covered. A brief summary is given by table 14, which represents how often these categories were mentioned by the informants.

Table 15 Early Eating

	Normal	Anorexic	Bulimic	Obese
No problems/ Normal	13	11	12	5
Early Eating Problems	5	5	5	4
The One Without Problems	3	2	9	1
Ate Quickly	1	0	3	4
Amazing Appetite	0	0	2	6
Arguments about Eating	0	3	3	3

As the above table demonstrates, many of the informants described their eating behaviour as children as normal and without problems. In fact 'normal' was often given as the sole answer if the informants couldn't remember any specific episodes or descriptions by their parents. As one informant put it: *'Normal. Nothing sticks out'*.

It is interesting that normals, anorexics, and bulimics described with very similar frequencies that they were normal eaters in their childhood, but this was much less the case for the obese group. Particularly in context with the finding that they were the group most likely to describe 'amazing appetite' or 'ate quickly' it seems plausible that even as children they were more prone to over-eating.

Examples of this amazing appetite could only be found in the bulimic and obese groups, which were the groups most likely to describe over-eating as part of their eating pathology.

'Was described as a bottomless pit because I ate a lot and was skinny' (O9)

'Gluttonous, overeater, I ate too much bread.' (O2)

'Was renown for eating a lot all the time. Despite this was skinny and doctor advised to feed me up. I liked school dinners at primary school because they were all squashy and squishy. No problems with food. Arguments centred about 'When is it ready, when is it ready?'. (BN13)

The above examples also illustrate that the informants weren't always overweight in their childhood and that in fact 'feeding up' was seen as a way to combat their skinniness. Their amazing appetite was therefore not always seen as a problem but as a remarkable phenomenon.

I only coded those eating behaviours as problems that were described by the informants as being a problem for them or their parents. The four subgroups have nearly identical frequencies of mentioning early eating problems (early in this context was defined as pre-school). This somewhat contradicts the findings of the statistical analysis that normals reported more early eating problems. A closer look at the content of the answers reveals that the eating disordered groups mainly based their answers to the question if there were any eating problems on the issue of fussiness. If their eating was normal they were 'good eaters', if they were fussy or picky they were 'bad eaters' or had a problem. In contrast to that, all normals, who admitted to eating problems, described physiological ones (like allergies or gastrointestinal problems) partly in concurrence with picky eating. An example for this is N1 who stated:

'My eating was fine until I was 11/2 . I developed bad colic and vomiting. Was a very picky eater, never hungry. Worried I would choke on food or feel sick. My parents took me to a specialist who got me vitamin supplements.'

Whereas the following statements are more typical for the eating disordered groups:

'I was a picky eater. Played with food a lot, not keen on eating it. Very fussy about eating.' (AN11)

'As a baby I cried a lot because I was hungry. When I was fed I would fall asleep during the feed. I was always a picky eater. Arguments with my parents about clearing my plate. My brother always ate a lot, liked eating.' (BN20)

As the last example indicates, siblings were often used as a comparison, they created a kind of norm for the family to which the informants were compared to by their parents or to which they compared themselves. It struck me during the interviews how often in particular the members of the bulimic group stressed that as a child they were the one in their family without an eating problem.

'Was a very good girl because I ate everything up. (...) My brother and sister were picky eaters.' (BN16)

'We had no arguments about food until I became bulimic, but my parents often argued with my brother who was a fussy eater.' (BN14)

'I was a quite good eater, ate almost everything and was the easiest in the family to please.' (BN7)

As table 14 shows this occurred in all the groups, but by far the most in the bulimic sample.

Not only is it revealing which group most often recalls certain behaviours or occurrences, but it is also interesting when a group doesn't recall events. This is the case in the category 'arguments about eating' where none of the normals recalled any episodes. The other groups didn't mention this kind of argument very often but some did as the following examples testify:

'My parents joke about how I used to hide food. My sister got eggnog to put on weight- I wasn't allowed any [age 6]. I always had arguments with my parents who thought I ate too much. (O11)

'Arguments were about not wanting to eat something. 'That's just too bad, you stay there until you have eaten'.' (BN17).

To recapitulate the results of this section, the obese group was the one group most likely to see their early eating as a problem and indicated that quick eating and eating vast quantities were prevalent from early childhood onwards. In comparison with their siblings, the bulimic group stressed that they were the ones without an eating problem. In the following section I want to further explore the occurrence or influence of other family members eating on the informants eating behaviour.

7.5. Eating Disorders

The last topic to be discussed within this chapter is eating disorders. Within the interview the three eating disordered groups talked about the development of their eating problem and how it progressed. Some insight into these statements will be presented in the first part of this section. The second part of this section will look at the occurrence of eating disorders within the nuclear family.

I was interested in the personal theories the informants had to explain their problem with eating and therefore asked about onset and progression of their eating disorder. Not surprisingly the factors held responsible for the development of their eating disorders were very diverse and for the purpose of this study I want to concentrate on factors that have been named repeatedly.

The single factor most often given as a reason for the onset of their eating disorder was 'Body Dissatisfaction' and concerns about their weight and shape. Most of the women just stated that they 'felt fat' (particularly after a gain in weight) or that they got negative comments about being fat.

Some of the informants went into more detail when they described:

'I was unusually tall and therefore felt heavy. Since 12 I have had problems with eating. My sister was anorexic and then bulimic. My mother was very slim, didn't want fat daughters. She always criticized my size. I didn't want to be as 'big as a bear'. [Her name is Ursula, Ursus=bear] (BN18)

'From 8 onwards I was concerned about my weight, eating problem since 13. I felt heavier, less attractive. Ate more and was quite lazy, avoiding of physical activities. (...) At 8 a doctor said I was too heavy and advised a special diet - some sort of rice- it tasted so awful that my father fried it up for me with egg.' (O3)

'At age 16 I saw a picture of myself and found myself too fat (although retrospectively I wasn't) and went on a very restrictive diet.' (AN13)

Feeling too heavy is obviously a very subjective feeling and as the last example points out, not necessarily based on reality. In fact a negative body image is one of the key elements of any definition of anorexia or bulimia nervosa. It is unclear from the interviews if a negative image of one's own body (or in other words feeling fat) made it more likely to develop an eating disorder, or if their existing eating disorder distorted their view of their body even retrospectively. In particular, informants with an eating problem described that from early childhood onwards they felt conscious of their weight. One of the more poignant examples of this was a bulimic woman who recalled:

'I started dieting with 7 and always have been very weight conscious. For example I slept with a belt around my waist.' (BN14)

The second most often named reason for the onset of their eating problem was 'Stress'. This of course is a very wide term and this category covered relationship problems, negative atmosphere at home or academic pressure. Interestingly, the obese group mentioned this reason only once whereas anorexic and bulimic women obviously attributed their eating problems to a greater extent to stress. The following examples also illustrate that the informants usually described several stress factors coming together to accumulate into an eating disorder.

'Experienced a build up of different pressures at school, home, in my friendships. I felt so stressed that I cut back eating. I lost very quickly 4 stones down to 4 1/2 stones.' (AN8)

'I wasn't happy with family life. Father was highly critical of me and put a lot of pressure on me. Parents argued all the time. I started a 'healthy diet' which got out of hand.' (AN1)

The description of dieting getting out of hand was representative for many of the anorexic and bulimic interviewees. In particular, the anorexic informants stated that they started by cutting back on some foods, that things 'snowballed' and they restricted more and more foods. In the interviews with the bulimics it was apparent that a number of them had had some anorexic phases where they managed to severely restrict their food intake without any bingeing behaviour. Or alternatively, that they would have liked to be anorexic or considered themselves 'failed anorexics'. Interestingly, in the obese group several women mentioned that they considered themselves as 'failed bulimics'. This was particularly true for women who could be classified as having Binge Eating Disorder (BED). They often described that they had tried to induce vomiting or in fact used laxatives and/or diet pills but that their weight was still above the normal weight range.

Another factor, which was repeatedly mentioned, was a change in their life style. This could be a change of school, parents' divorce, starting university etc. Suddenly their lives changed and so did their eating behaviours.

'Between 16 and 23 I was anorexic. I was send to a boarding school far away from home. I did not like it and felt out of control but I also wanted to be part of it. It was a girls school and everyone was conscious about their figure.' (AN14)

'I relate my eating problems to changes in my family when, at age 11, two foster children came to live with us. I had the feeling I did not fit into this perfect family and one area I could control was food. The meals were awful and I generally felt unhappy with my body. I started to diet and in everything I am doing I want to be the best.' (BN11)

'At 12 moved from Russia to Britain. Much bigger choice of food. Delicious food was comfort and substitute.' (O4)

The above examples also illustrate the way the different groups used food. Overall the anorexics were more likely to restrict their eating as a response to stressful situations. Cutting back on food is also an attempt to regain control. New situations (like new school, divorce) were likely to evoke feelings of being out of control and weight loss was an additional 'bonus'. Loosing weight is regarded as a positive achievement and for some of the anorexics it presented a way to be more attractive and thereby more popular, or simply to fit in. For the bulimic group body dissatisfaction was one of the key issues but eating, like not eating for the anorexics, was very much a control issue. The informants of the bulimic group were more dichotomous in so far as they responded to changes or stress either with strict dieting or using food as a comfort, '*the one thing to look forward to*'. Similar to the bulimics, the obese informants appeared to be using food as a comfort but they also ate out of boredom. They felt conscious of their weight and unhappy with their shape but didn't describe this to the same extent as the bulimics, which might explain, why they didn't employ purging behaviours.

Another factor, that was a recurrent theme of their answers, was food and eating within the family. Many of the informants held their parents responsible for their eating problems either because they were too controlling, giving them the 'wrong' food or the parents had a problematic eating pattern themselves. The next few examples will highlight these issues:

'Had an anorexic mother, she moved out when I was 16. Before that I had no control over what I ate. Then I wanted to control my own weight, my mother had fed me up. Started to eat healthier, before 16 we lived on Chinese take-aways. My mother said I was a fussy eater, but never had the choice. When I did my own food shopping I lost a lot of weight.' (AN10)

'I was bulimic between 19 and 30. Mother was trying to leave my father, who was an alcoholic. My mother was always on a diet and was always going on about how she was doing. A girl told me about bulimia, I was working in a pub at the time and was always surrounded by food. (BN3)

'I was obese all my life. From 5 onwards I stole money to buy sweets. Obesity runs in the family, no traumatic reasons. My mother was always afraid her children would be fat (she herself has been fat until she had children). Dieting was part of my mother's life. I always wanted to eat more. From high school onwards parents were out working and therefore had no control over my eating. I saw a dietician (age 11) and joined a children's diet club, which was almost like punishment. My parents saw my eating as something you have to fix yourself.' (O6)

'From 13 onwards I was concerned about my weight, was obese. Parents used to give me a lot of sweets and chocolate, which I see as the reason for my obesity.' (O18)

These examples lead us to the last section of this chapter, namely eating disorders of other family members. As the above examples underline the eating style of the mothers, in particular, was an important issues for their daughters and is also the focus of a lot of eating disorder research (Pike & Rodin 1991; Whelan & Cooper 2000).

The table below gives an overview of how prevalent eating disorders were in the immediate family; also included in this table is parental dieting behaviour. Dieting is an important part of the development of eating disorders and transmission of weight control can be found at an early age (Hill & Franklin 1998). Because dieting is so prevalent, I only included cases when the informants made statements like 'mother was on constant diets' or 'mother lived on diet foods' which implied that diets were not only occasional occurrences. To include parental dieting behaviour seemed relevant to me because of the number of informants referring to this behaviour when asked about the development of their own eating disorder. None of the informants had a father with an eating disorder.

Table 15 Eating Problems within family

	Mother / Father dieted	Mother eating disordered	Sibling eating disordered
Normal	1	0	1
AN	4	3	0
BN	7	0	3
Obese	2	2	2

The table demonstrates that constant dieting of a parent was more prevalent in the bulimic and anorexic groups, which were the two subgroups most likely to restrict their eating behaviour themselves. The table also indicates that the normal group was the least likely to have a close family member with an eating disorder.

All of the eating disordered mothers of the anorexic informants suffered from anorexia themselves and, according to their daughters' accounts, were trying to feed their children up and were very controlling about their food intake.

> *'Mother gave us large amounts of food, individually cooked for us. Always bags of crisps or chocolate. It was ok to eat as much as you wanted. At age 12 I found out that my mother was anorexic. She was very controlling. I had to eat everything on the plate. For example my mother poured boiling water over my hand because I didn't eat all my chips. She got a panic attack- father didn't want a scene. (...) Mother cooked well but ate only salads. Piles of food on their plates, for example had a whole poussin for myself. Another memory of the dog licking the food and didn't want to eat it - mother had panic attack.' (AN10)*

The eating disordered mothers of the obese women suffered from BED and Bulimia nervosa, which are both disorders characterised by binging on eating large quantities of food. Interestingly, both the daughters in this situation described binging behaviour as part of their own problematic eating behaviour.

Regarding the siblings, there was a less close relationship between their eating disorder and the informant's eating disorder. One woman of the normal group described her sister as being bulimic. Within the bulimic group there were two bulimic sisters and one brother with BED and morbid obesity. Amongst the siblings of the obese informants there was one anorexic brother and one sister with BED. It also follows that although quite a number of siblings might have had a problem with eating, only a small number proceeded to develop an actual eating disorder.

8. Discussion

The principal purpose of this study was to examine whether early experiences with food and eating influenced women's eating patterns in later life. If this was the case, then did any factors have any specific association with the development of any specific eating problem?

At a young age the family is undoubtedly one of the main influences on a child, and based on clinical observations and empirical research family characteristics have been extensively investigated. Looking at the literature it is quite striking to what extent a stereotype of the anorexic, bulimic or obese family exists. In this context the cliché that "you are what you eat" has also found its expression in the socio-economic status linked with different forms of pathological eating. Anorexia has traditionally been described as an illness, which mainly afflicts girls from upper-middle class, white families (Bruch 1974), whereas bulimia has been linked with the desire to surpass the original socio-economic background (Boskind-White & White 1983). Conversely, at least in Western society, obesity is commonly associated with lower socio-economic status, especially for females. While the informants in the present study did not differ significantly in their current SES, differences in the SES of the family of origin did reach significance level; with the normal group having the highest SES overall. In contrast to most studies of the association between weight and SES, more than 60% of the obese women in this study came from social class 1 and 2; and a similar proportion currently belong to these classes. In fact the distribution of obese and anorexic informants across SES groups was not substantially different from the normal group. Consequently any differences between the groups are unlikely to be merely a result of upbringing in different social classes.

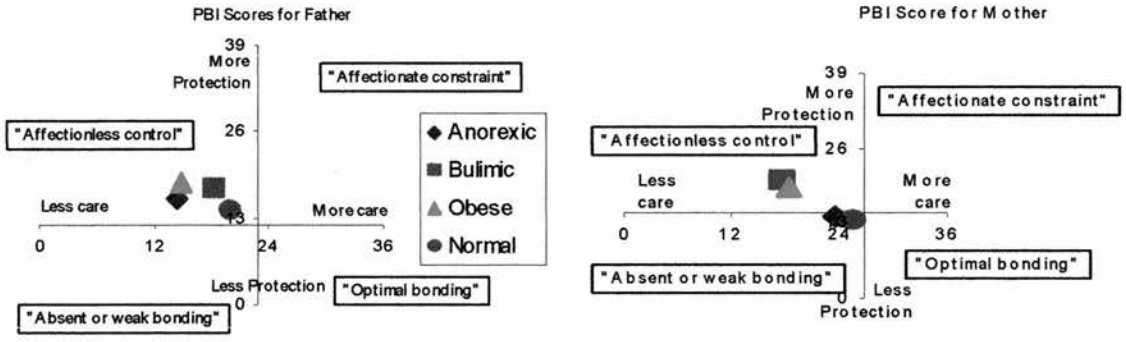
One of the areas where families of eating disordered and normal women differed was in the history of psychiatric illness within the family. Eating disordered informants were more likely to have at least one family member with a psychiatric illness. In particular, the obese group (72%) and the bulimic group (67%) reported high

prevalence rates amongst their family members. The high proportions of psychiatric disorders tie in with previous research that suggested there might be a common familial vulnerability for eating disorders and other psychiatric disorders, like mood disorders or substance abuse (Strober 1995; Hudson, et al. 1987). Given the findings of previous research into the heritability of eating disorders (Lieberman 2000; Strober 1995), it was somewhat surprising that although eating disorders were more prevalent amongst family members of eating disordered informants, this difference failed to reach significance level. However one weakness of this study was that the prevalence of psychiatric and eating disorders was calculated purely on the base of the informants' accounts. Consequently it is possible that family members were perceived and reported as having a disorder when this was not the case and vice versa. No significant differences between the groups were found in any other demographic characteristics like family size, family structure, birth order or ethnic background.

Family characteristics have been explored as a potential risk factor for the development of eating disorders, but previous research has focussed less on demographic features and more on family interactions and dynamics. Based on psychosomatic approaches, observations on the nature of family relationships have suggested that families of anorexics are enmeshed, overprotective, rigid and have problems resolving conflicts (Minuchin, et al. 1978; Palazzoli 1974). In contrast to this, families of bulimics have been characterised as being low in cohesiveness, low on the open expression of feelings and high in conflicts (Johnson & Flach 1985). One of the instruments frequently used to explore the relationship with parents is the PBI (Parker, et al. 1979), which was also used in the present study. Interestingly, the results of the PBI demonstrated significant differences between the groups in the informants' relationships with their mothers, but not with their fathers. Overall the eating disordered women remembered their mothers as being significantly less caring and more overprotective than women without an eating problem. This was particularly true for the bulimic and obese women. Parker (Parker 1983) suggested the use of care and overprotection scales to define four broad parenting styles: 1) optimal bonding (high care, low control); 2) affectionate constraint (high care, high

protection); 3) weak bonding (low care, low protection) and 4) affectionless control (low care, high protection). According to this classification system, the eating disordered groups as a whole rated their mothers as having a parenting style of 'affectionless control'. This compared to the control group, whose mothers were more likely to show 'optimal bonding'. Figure 1 shows this classification system graphically, with the results for the four sub-groups from this study plotted on the two sub-scales.

Figure 1: Graphical plot of the PBI sub-scales. Axes cross at the mean scores found in the validation study (Parker, et al. 1979).



Looking in more detail at the four subgroups it was evident that the anorexic group rated their relationship with their mothers as more positive than the other eating disorder groups. In fact they were very similar to the normal group. It is frequently argued that anorexics have a tendency to idealize their parents and to portray the 'perfect family' (Russell, et al. 1992; Ward, et al. 2000), which may have attenuated any differences that were present. Although this possibility can't be excluded it seems unlikely given that the anorexics rated their relationship with their fathers most negatively of all the four groups.

With the exception of the bulimic group, the informants described a more positive relationship with their mother than with their father - a commonly found pattern (Parker, et al. 1979; Calam, et al. 1990; Palmer, et al. 1988; Steiger, et al. 1989; Pole,

et al. 1988). However, Steiger et al. (Steiger, et al. 1989) went further by arguing that the perceived absence of parental care is a crucial factor for all eating disordered subgroups. In particular, he suggested that the feeling of having failed to please their fathers might play an important part in the pathogenesis of eating disorders. The present study could find only partial support for this theory. Although there was a trend for the eating disordered groups to perceive their fathers as being less caring than the normal group, this difference was not statistically significant. Furthermore the bulimic subgroup described their fathers as being more caring (if only by a small margin) than their mothers. Still, the role of the father in the pathogenesis of an eating disorder should not be neglected, as the quality of the perceived relationship with the informant's father was significantly associated with some aspects of their current eating pathology.

A different pattern evolved for fathers and mothers when the results of the PBI were correlated with other questionnaires. The perception of low paternal care was associated with more severe bulimic attitudes and behaviours as measured by the BITE and Bulimia sub-scale of the EAT. On the other hand, the perception of low maternal care and overprotection was associated with dieting, interoceptive awareness and body dissatisfaction (EDI). Not only eating attitudes and behaviours but also aspects of personal development were affected by the parenting style as both maternal and paternal care were inversely correlated with feelings of ineffectiveness, personal distrust and perfectionism (EDI). In summary, women who perceived their parents as less caring and more overprotective were more likely to exhibit more severe eating pathology.

As the original author of the PBI himself pointed out, the perception of a parenting style of affectionless control is characteristic for most psychological disorders and therefore not specific to families with eating disorders (Parker 1983). The PBI has been criticised for failing to differentiate between different forms of eating disorders, as both anorexia and bulimia fitted the same pattern (Calam, et al. 1990). However, the present study found not only marked differences between eating disordered and

normal women, but also between the different forms of eating problems. In this context the inclusion of obese informants in the present study was valuable. The PBI has previously been used to compare: restricting and bulimic anorexics; bulimics with and without a history of anorexia versus normal controls; psychiatric outpatients; and women with experiences of sexual abuse (for a recent overview see Ward, et al. 2000). As far as this author is aware, obese subjects have not previously been included as a comparison group.

Although obesity as such is not usually regarded as a psychological disorder the obese women participating in this study clearly described a parenting style of affectionless control, which is characteristic for individuals with psychological problems. Studies concerning the mental health of obese individuals have come to conflicting results. Some found support for the 'jolly fat' hypothesis, which argues that obesity reduces the risk of depression. Others have found an association between obesity and depression and low self-esteem (Roberts, et al. 2000). These conflicting findings have been explained by differences in the subject samples being used. For example, obese subjects involved in treatment programs are likely to be different from obese subjects within the general population, who may not see their obesity as a problem or feel the need for medical or psychological attention. It has also been demonstrated that obese individuals who binge eat show more similarities to normal weight bulimics than those who don't. The present study classified obesity solely on the base of BMI and did not differentiate between binge eaters and non-binge eaters. However, as the BITE scores indicated, the obese group had very similar bulimic attitudes and behaviours to the bulimic group. Also, in regards to the PBI, the bulimic and obese groups were the two most similar. This would tend to suggest that the obese informants in the present study were more likely to be binge eaters and hence conflicts with the 'jolly fat' hypothesis. However, this may also be due to a selection bias within the present study, as the obese group were partly recruited from the Cullen Centre clientele, in other words a treatment-seeking group.

The qualitative analysis of the interview data in particular revealed that 'control' was more of an issue for the women with eating problems than the normal women. The former group described their parents as more controlling and also that they felt out of control concerning their own food intake. Studies of the effects of parental controlling behaviours have confirmed that an authoritarian parenting style (highly demanding but unresponsive) has a detrimental effect on a child's development (see Darling & Steinberg 1993 for a review). Comparing the statements of the informants in this study it emerged that the anorexic group described the most controlling family environment. They were the group most likely to describe oppressive meal situations, very formal meal set-ups and generally strict parents. The anorexic family has previously been portrayed as an enmeshed, rigid system, which does not encourage autonomy or individualisation (Bruch 1973; Palazzoli 1974; Minuchin, et al. 1978). One response to this over control previously described is an excessive need for self-control, which manifests itself in the area of eating and weight control (Fairburn, et al. 1999). That parental control during meal times has an impact on the development of eating behaviours has also been demonstrated (Birch & Fischer 1998; Birch & Fisher 2000). Their findings indicated that excessive parental control in feeding interactions could have detrimental effects on the child's capacity to regulate their own energy intake in later life. Although Birch and colleagues mainly formulated their theories for obesity, one could argue that anorexics are equally unable to respond appropriately to hunger and satiety cues.

Even though the bulimic and obese groups described the fewest rules about eating (table manners, clearing the plate etc) and the least strict parents, they did report more parental restrictions in regard to food intake and enforced diets. The restricted foods were usually high in sugar, carbohydrate or fat and the informants clearly made the connection between food restrictions and their parents' desire to facilitate weight loss. Bulimics are reported to share the values of what food is 'good' for you and what food is 'bad' (namely chocolate, chips, sweets, fried food, etc.) with the rest of the female population - nevertheless during a binge it is mainly this 'bad' food that will be consumed (Habermas 1990). In this context, Birch and colleagues research about children's food preferences is of interest as it indicated that restricting a child's

access to certain foods actually increased their attractiveness (Birch & Fischer 1998). It has also been shown that maternal restriction of snack foods led to an over consumption of those same foods when in an unrestricted setting, especially for girls (Fisher & Birch 1996).

Parents are most likely to enforce control in those domains of child development where: 1) the parents have a problem regulating their own behaviour, 2) parents perceive their child to be developing problematic behaviours and 3) the child demonstrates a lack of self-regulatory behaviour (Costanzo & Woody 1984). How do these conditions then transfer to the eating disordered groups in the present study? According to the recollections of the informants, parental shape during the informants' childhood did not differ significantly between the groups. However, in comparison with the mothers of the normal eaters, the mothers of the eating disordered group were reported to be significantly more concerned about their own weight and were more likely to diet. Asked about their own figure/shape during childhood, the eating disordered informants rated themselves as heavier than their contemporaries and heavier than the normal group. In the PARTS questionnaire and the interview, the parents of the obese and bulimic group particularly, were described as being highly critical of their daughters' appearance (in particular weight and shape). This indicates that the parents perceived their daughters weight as a problem. Furthermore, the enforcement of diets and overall food restrictions implies that the parents viewed their daughters as unable to control their own food intake adequately. On this background it seems plausible that the parents of eating disordered informants exerted more control in the domain of eating and weight control, just as described (Costanzo & Woody 1984).

In the context of control, not only the issue of the informants' eating behaviour, but also that of their mothers is of importance, as the impressive research by Stein and colleagues demonstrated (Stein, et al. 1994; Stein, et al. 1999; Stein, et al. 2001). Observing eating disordered mothers and their young children in meal and play situations they found that eating disordered mothers were more intrusive, expressed

more negative emotions towards the child and were more likely to use strong verbal control in both situations than the comparison mothers. According to the statements of the informants in the present study, 10% of the obese and 17% of the anorexics' mothers had a form of eating disorder. In contrast, none of the mothers of the bulimic or normal group suffered from eating disorders. Additionally 10% of the obese, 33% of the bulimic and 22% of the anorexics reported that their mothers were on constant diets. The same group found that the level of dietary restraint of the mothers was one of the features associated with the use of verbal control towards their children (Stein, et al. 2001).

However, despite the differences described above, the four groups in the present study reported more similarities than anticipated. For example, they described no differences overall in their judgement of their families' closeness or warmth. Although these fairly general questions were included to approach the subject of family interactions within the interview, they might have been too general to elicit differences. Most of the interview questions enquired about the informants' childhood and were consequently open to the normal limitations or biases of memory. As previously described, the recollection of past events is more reliable if informants are asked about specific events rather than making global statements about family atmosphere (Brewin, et al. 1993). In accordance with this the qualitative analysis of the interview demonstrated the greatest differences between the groups when subjects recalled concrete episodes, like being made to eat certain foods, or hurtful comments about their eating and appearance.

The theoretical part of the study extensively reviewed studies concerning the impact of very early feeding on later development. However, the current study could not find any differences between the groups in regards to the occurrence or duration of breast-feeding. Equally, the quantitative analysis of food likes and dislikes produced no significant differences between the groups. However, the qualitative analysis of the interview data elicited that the women without a history of eating problems had more positive memories of food and eating in early childhood overall than the

women with eating problems. Of course a qualitative analysis of breast-feeding interactions was not possible as the study was based on the retrospective reports of the daughters.

Curiously, the normal group reported more problems in regards to early feeding and eating than the eating disordered group. This contrasts with previous work, which detected an association between early eating problems and the increased risk of developing an eating disorder (Marchi & Cohen 1990). The authors identified pica and problematic meals as particular risk factors. Whereas none of the participants in the current study reported pica, the eating disordered group more often described situations that would qualify as problematic meals. A closer examination of the interview data revealed that the normal group had significantly more physiological problems like colic and food allergies, but that this was not the case for behavioural problems like picky eating or refusal to eat. This distinction was further underlined by the qualitative analysis of the interview data, where eating disordered informants described eating problems or being a 'bad eater' almost exclusively in the context of picky or fussy eating. Marchi & Cohen saw picky eating as a protective factor for bulimia nervosa but a Chi-square test of the four groups in the present study could not find support for this, as there were no significant differences between the four sub-groups on this factor.

The conflicting findings could be due to the very different nature of the studies. Marchi and Cohen followed a large sample of girls over a ten-year period and demonstrated associations between early feeding problems and either eating disorders or symptoms warranting concern. In addition, at the end of their study the girls were still only teenagers. It is therefore highly likely that this would result in an underestimate of the true prevalence of eating disorders in their sample, as the development of more pathological eating patterns later in life has to be expected. This would be especially true for obesity where the average age of onset is higher. On the other hand, the present study relied on retrospective accounts of women who fulfilled, at some point, the diagnostic criteria for an eating disorder or obesity.

Further evidence that these methodological differences may be the explanation for the difference in the results comes from another study that employed retrospective accounts. It that case, no significant early feeding or eating problems amongst bulimic women were found, at least not according to the mothers who participated in that study (Mitchell, et al. 1986).

Early feeding and eating problems are common within the normal population with at least 25% to 40% of young children displaying eating patterns which give their parents reason for concern (Maloney & Ruedisueli 1993). However, a much smaller proportion require medical attention (Dahl & Sundelin 1986) and it seems likely that, over time, parents will forget problematic eating behaviours (unless they are prolonged, severe, or in any way exceptional) and therefore won't tell their children about it. This might explain why most of the informants described their early eating as normal and without problems. However, one could hypothesise that the parents of eating disordered women are more likely to remember childhood eating problems that had elements of the later eating disorder (for example picky eating and anorexia). Another example of this potential recall and reporting bias could be the finding that only bulimic and obese informants described amazing appetite or eating their food very quickly as children, although this was not necessarily seen as a problem. All of the bulimics and 72% of the obese group reported binge eating as a part of their disorder, this is characterised by similar features to their childhood eating patterns and hence these patterns are perhaps more likely to be remembered. According to Maloney & Ruedisueli, parents seldom complained about this eating pattern of their children despite the fact that a considerable proportion of the young children were overweight (Maloney & Ruedisueli 1993). It was not possible, in their study, to determine whether excessive or voracious appetite was really uncommon or whether it simply didn't constitute a problem for most parents and therefore wasn't reported.

As expected, the self-rating questionnaires measuring current eating behaviours and attitudes showed highly significant differences between the groups, with the normal

group reporting the least and the bulimic group reporting the most, pathological attitudes and behaviours. All three eating disordered groups declared significantly more dieting, dissatisfaction with their own bodies and a higher drive for thinness at the time of interview. It was the intention of this study to explore whether these attitudes and behaviours were also more pronounced during childhood or just a result of the eating disorder. In regards to childhood dieting, statistically significant differences were found in regards to the age of onset of dieting, with the obese group being the youngest (12.7 years), followed by the bulimic group (12.8 years), the anorexic (14.2 years) and finally the normal group (16.1 years). Also 45% of the bulimics and the obese group stated that their parents forced them to diet, whereas none of the normal or anorexic group reported this. In this context it was interesting that the anorexics and normals tended to comply with any food restrictions by their parents, whereas a considerable proportion of the bulimics (42%) and obese (46%) did not. It seems that the anorexics and normals restricted their own food intake later and voluntarily, whereas the parents of the obese and bulimic informants tried unsuccessfully to introduce diets at a younger age. In comparison to the findings of other groups, the average age of onset of dieting in the present study was comparatively 'old' as dieting has been found to be a common practice amongst 9 year-old girls (Hill & Robinson 1991; Hill 1993; Hill & Franklin 1998). However the average age of informants in the present study was 28.6 years, which means that they were preadolescents in the late 1970's and early 1980's. Any comparisons between this and earlier studies have to take into account the marked cultural changes that have taken place in the last twenty years, as described in section 2.1.4 of this thesis. In the face of dramatically increasing rates for childhood obesity and referrals for childhood onset eating disorders, it is also likely that dieting patterns have been affected. Hill et al. themselves argued that even if the absolute level of adolescent dieting has remained relatively stable, it has become a strategy practised by girls of increasingly younger ages (Hill 1993).

In terms of dieting and its impact on the development of an eating disorder, bulimic and anorexic informants in particular described that their eating disorder commenced with cutting back certain foods. These restrictions often 'snowballed' and soon left

the women with very little food that they permitted themselves to eat. Whereas dieting preceded the onset of pathological behaviours like bingeing or vomiting by several years for the anorexic and bulimic sub-group, the obese group described the onset of bingeing and dieting at virtually the same time (12.8 years and 12.7 years). The onset of dieting prior to bingeing in the anorexic and bulimic groups supports the theory that dieting or restraint eating can lead to episodes of excessive eating (Polivy & Herman 1985). Restrained eaters learn to ignore their physiological needs, thereby substituting a cognitive control for their bodies' automatic homeostatic mechanisms. As a result, they are more likely to exhibit "all-or-nothing" behaviour characterised by a severely restricted food intake followed by excessive eating. The simultaneous onset of bingeing and dieting in the obese group perhaps goes some way to explaining why they gained weight to an extent that is not seen in the other groups, particularly the bulimic group. Although it cannot be explicitly shown from the data in this study, this discrepancy suggests that one likely difference between the obese group and the other eating disordered groups is the ability to resist the urge to binge relative to the ability to restrict dietary intake or resist the urge to purge.

In the context of breaking a diet one could argue that it is important who initiated the diet. As stated above, bulimics and obese informants were more likely to be forced by their parents to diet and they were also more likely not to comply with food restrictions. In the interview statements, it became clear that eating or not eating fulfilled a number of different functions for the informants. For the anorexics not eating was a way of regaining control over their lives, whereas secretly eating or even stealing to obtain sweets and chocolate was more often a way for the bulimic and obese group to rebel against parental control. In this way opposite behaviours secured the same purpose in both groups. This discrepancy helps to explain why the similar patterns of parental behaviour detailed earlier in all the eating disordered groups can still be related to the pathogenesis of the different eating disorders. It is the interaction between the parenting style and the individual's response to that style that appears to be implicated as the risk factor for future problems.

The relationship between parental controlling behaviour and maternal eating disorders have been discussed above, the following sections will concentrate on the relationship between the eating and dieting behaviours of the mothers and those of the daughters. A number of studies have suggested that women with eating disorders have mothers who are pre-occupied with weight and dieting. Hill et al. showed that mothers and their young daughters shared similar attitudes about weight and dieting (Hill, et al. 1990). Similarly others found that mothers of eating disordered women had more eating problems and furthermore rated their daughters as less attractive and in greater need of losing weight than mothers of control subjects (Pike & Rodin 1991). Finally, Striegel-Moore & Kearney-Cooke demonstrated that parents who were trying to diet themselves were more likely to encourage their daughters to do so as well (Striegel-Moore & Kearney Cooke 1994). In total, five women in the present study stated that their mothers were suffering from an eating disorder. It was clear from the interview data that the three anorexic mothers were using fairly extreme measures to control their daughters eating patterns. The most extreme example being the mother pouring hot water over her daughter's hand when she refused to eat her food. Interestingly, all three daughters were suffering from anorexia themselves and stated they had no control over their food intake as a child and that their mothers were trying to feed them up. One could argue that because of their anorexia the informants overestimated the amount of food their mothers wanted them to eat. However, the over-feeding of other family members has been observed in clinical practice and Bruch reported that several mothers contacted her because their anorexic daughters made them gain weight (Bruch 1978). Because of the relatively small number of mothers with eating disorders it is difficult to make assumptions about general patterns, however the eating disordered informants were more likely to describe their mothers as restrictive eaters.

The present study, in keeping with the studies mentioned above, found evidence that women with eating problems were more likely to have mothers for whom food and eating had also been a problem. As reported by the informants, the mothers of the eating disordered women had a higher prevalence of eating disorders. They were more often reported as constantly dieting and were more likely to be concerned about

their weight and shape. No differences in the mothers' shape were reported during the informants' childhood, but a greater presence of extremes in current shape for the mothers of eating disordered women was found. Of course, it is impossible to rule out the effect of the informant's own eating disorder on the perceived shape of her mother. However, if this was the case it is likely that the shape of the mother during the informant's childhood would be similarly affected, but this was no different to the control group. One previous study pointed out that although the mothers of eating disordered women did not differ in weight from control mothers they still had different diet histories (Pike & Rodin 1991). Another main finding of their study was that mothers of eating disordered women were more critical of their daughters and their own appearances than control mothers. This is consistent with the results reported in the present study.

In a society where beautiful equals slim, body image and dieting are inseparably connected and it was therefore not surprising that the statistical analysis of the interview data indicated a strong association between weight and shape as a child and the extent of negative comments about their appearance. The heavier girls were more likely to start a diet at a younger age and they experienced more teasing about their weight and shape. The obese group portrayed themselves as the heaviest group in childhood too. This confirms the findings of other studies that childhood obesity is one of the best predictors for adult obesity (Guo, et al. 2000; Whitaker, et al. 1997). Less expected was the finding that the anorexic and bulimic groups also described themselves on average as heavier than the normal group. This finding has to be seen in the context that body image distortions are characteristic for eating disorders and it is therefore plausible that even the recollection of their figures as children were distorted. However, the three eating disordered groups also described more teasing about their shape in the PARTS questionnaire as well as in the interview. The eating disordered groups didn't perceive themselves as different from their contemporaries in any aspect apart from weight and they didn't experience more teasing about their general appearance than the normal group. Consequently if a negative bias in the recollection of the eating disordered women occurred, then it exclusively concerned weight and shape. This consistency also demonstrates the usefulness of combining

quantitative and qualitative analyses in order to more fully characterise the behaviours exhibited by the subject groups.

An alternative argument could be made that the normal group was unusual in regards to concern about their weight, insofar as their onset of dieting was comparatively late. Furthermore, given that even young girls favour a slim body shape and feel 'too fat', it is remarkable that the normal group on average described a bigger ideal body shape than their actual size. The assessment of actual and ideal shape in childhood was based on Collins, who used figures illustrating body weight ranging from very thin to obese (Collins 1991). The girls taking part in her study chose a similar ideal body shape (mean = 3.52) to the informants of the present study but rated their actual body shape (mean = 4.00) as heavier than the normal group but lighter than the eating disordered groups. Further prospective studies will be needed to determine if the weight differences found between the groups were co-incidental or if being light in childhood is indeed a protective factor for the development of eating disorders.

That negative comments and teasing about sensitive personal features such as weight, size and appearance can have a detrimental effect on an individual's personal development has strong face validity but has also been previously reported (Thompson, et al. 1991). In the present study, teasing was one of the areas where the most dramatic differences between the eating disordered and normal groups were found. This was particularly evident for the weight/size related teasing scale of the PARTS, where the differences between the groups proved to be highly significant. The original validation studies of the PARTS found that the sub-scale Weight/Size Teasing had associations with a variety of measures of psychosocial distress (Thompson, et al. 1991). In the present study the Weight/Size Teasing Scale was strongly associated with almost all measures of the eating questionnaires as well as the current BMI and body shape in childhood.

The original PARTS enquired only about comments by peers and male family members. Conversely most studies exploring the relationship between family

environment and eating behaviours did not focus on the father but on the role of the mother. It is traditionally the mother who is responsible for a young child's physical and emotional needs, and given that most sufferers of eating disorders are female the mothers have been considered likely role models in the transmission of weight concerns. Furthermore it is well documented that females (including children) prefer a slimmer body shape than males (Collins 1991). It therefore seems plausible that this preference finds expression in comments about weight and shape. For these reasons two questions were added to the original questionnaire enquiring about teasing by female family members.

A comparison of teasing by family members showed that the eating disordered groups were significantly more often teased by family members of either gender, with the obese group experiencing the most teasing within their families. Interestingly all four groups reported that male family members voiced more criticisms than their mothers. The findings of the present study point in the same direction as another previous study, which demonstrated that mothers praised their child's appearance more often than fathers (Striegel-Moore & Kearney Cooke 1994). The authors concluded that the cliché that mothers criticise and fathers praise could not be upheld.

Another a result of their study was that parents view their children's attractiveness most favourably when the children were young and most critically when they were adolescent. The same impression was conveyed in the interviews in the present study. Many informants stated that they were happy with their appearance as a child and actively recalled positive remarks about the way they looked, while adolescence was more characterised by a negative body image and more teasing. Similar to the eating disordered groups, the normals also remembered negative remarks by their parents but those remarks were more likely to be made in adolescence, and of a different nature (wearing black clothes, dying hair blue etc). The eating disordered groups - particularly obese and bulimics - remembered mainly weight related teasing and as the qualitative analysis indicated these comments were more likely to be of a

detrimental and condemning nature. It is noteworthy that the anorexics perceived their parents as less critical of their appearance than the obese and bulimic women, which could partly explain the finding that anorexics described their parents as more caring than the other two eating disordered sub-groups. While anorexics didn't experience much teasing from their parents they reported frequent teasing by their peers about weight and this was true for both the interviews and PARTS scores.

While the PARTS documented the frequency of occurrence of teasing episodes it didn't allow any conclusions about the effects of those episodes. During the interviews it was often astounding how vividly the informants remembered some negative comments, which were made many years ago. This has to be an indication of how hurtful and memorable these comments were to the informants. It seems plausible that those negative comments helped to shape the negative body image, which is characteristic for individuals with eating disorders. However, given that the present study relied on retrospective reports it remains uncertain if the informants recalled more teasing because they were teased more intensely or if they were more sensitive to any negative weight related comments. This question has to be seen in the context of previous work which investigated the question of how eating disordered and non-eating disordered women dealt with adversity, including teasing, in childhood (Troop & Treasure 1997). The authors came to the conclusion that both groups faced the same degree of adversity, but that the normal group had coping strategies incorporating childhood mastery, whereas the eating disordered group experienced more helplessness. Still, even if this was true for the informants of the present study one could argue that those different coping strategies are the product of a different family environment. As discussed above, the eating disordered groups experienced more external control and arguably were therefore more likely to feel helpless and have few opportunities to experience mastery. Given the findings detailed earlier, that the eating disordered groups tended to attempt to re-exert control by use of their dysfunctional eating behaviours, it is easily seen how this hopelessness may further increase the risk of developing of an eating disorder.

This study is not without its drawbacks and limitations, many of which have been discussed at some length in the introductory and methods chapters. One of the major difficulties within this study was the recruitment of informants. Despite a prolonged period of data collection, the planned number of informants proved to be too ambitious. Furthermore I had not anticipated the reluctance of the informants to involve other family members or the reluctance of the family members to be involved. One could hypothesize that information sheets mentioning the inclusion of relatives in the study might have been a deterrent for some women to get in contact in the first place. A power calculation was not undertaken before commencing the study. The author is aware that from a methodological point of view this an short coming, from a practical point of view I was attempting to recruit as many informants as possible within the logistical limits of the project.

The original study design would have allowed more extensive statistical comparisons and provided an indication of the accuracy of recollection of early food related experiences. On the other hand having smaller group sizes meant that a more qualitative approach could be used, which had its own merits and elicited some insight into the more subtle differences between the four groups (for example the quality of negative comments about the informants appearance). Most of the studies involving eating disordered females as well as their mothers are undertaken with young girls still living at home. Consequently it might be more feasible to approach treatment centres for young persons and/or places for family therapy. However involving young girls would bring a different set of problems and furthermore obese teenagers are not often found in those treatment centres. Alternatively, if one is interested in the maternal experiences of eating in the family it might be worthwhile targeting the mothers directly in order to ask them about their own recollections about their daughters eating. Of course one would encounter the same problems in regards to the reliability of those recollections than in the present study.

Whereas some of the problems described above were not anticipated some methodological issues were anticipated and could only be acknowledged as

unavoidable and attempts made to partially correct for them in the data analysis. For example, it would have been desirable to have transcriptions of the interviews or a second person coding the available data to obtain information of inter-rater reliability. However given the time and financial restraints of a PhD study this was not feasible. The current study aimed at exploring a wide range of potential links between early eating related experiences and later eating disorders. For this purpose retrospective accounts constituted a practicable means of achieving this. However, to test the associations generated, prospective longitudinal studies would be required, particularly if they could include toddlers and their mothers (or the main carers).

With the benefit of hindsight some aspects of the measures could be altered. A relatively minor change would be further alteration of the PARTS. The PARTS is an American instrument and this is somewhat reflected in idioms like 'snickering' and an emphasis on the appearance of teeth. On a more fundamental level I would contemplate changing the balance of the areas of interest. Some areas of questions (meal times, contents of meals, aversions etc.) elicited relatively little differences between the groups whereas areas like body image as a child and teasing emerged as much more fruitful. Again with hindsight it might have been beneficial to have fewer questionnaires about current eating behaviours and to concentrate on the latter areas. Given the importance of childhood shape it might be an idea to ask the informants to bring a photo of themselves as a child with them.

In conclusion, the eating disordered and normal informants described differences in their family environment, especially in their perceived relationship with their parents. In particular, bulimic and obese women were likely to experience a parenting style of affectionless control whereas the anorexics saw their mothers in a more positive light. A recurrent theme in the results of this study both from the quantitative and qualitative sections was the issue of control. It has been shown to be not only important for the distinction between eating disordered and normal women, but also between the eating disordered sub-groups. The anorexic group reported the most oppressive mealtimes and strictest family environment, in contrast the bulimic and

obese groups were more likely to experience control and limitations in regards to food intake. A possible reason for increased control in the domain of eating and weight might lie in the eating behaviour of the parents or more precisely the mothers themselves, as the mothers of eating disordered informants were shown to be more concerned about their weight and more likely to have a restrictive eating pattern than the mothers of the normal group.

A further factor that emerged as significant in both quantitative and qualitative analyses was body shape during childhood and the responses to this shape. During childhood the normal group reported the slimmest figure, were most content with their appearance and were least likely to be teased about their weight by family and friends. Heavier weight in childhood was associated with an earlier onset of dieting and a persistent negative body image. Although it remains indistinguishable whether the eating disordered informants were more extensively teased or if they had less successful coping strategies to deal with those negative comments; what is clear is that they experienced such teasing as more traumatising than normals. In summary, based on the theoretical as well as the empirical part of this study it seems evident that there is a link between early eating related experiences and later eating disorders. As stated in the introduction, the ultimate goal of all research in the field of eating disorders is to increase knowledge in order to advance the treatment or prevention of eating disorders. In regards to prevention the present study has highlighted several difficulties. In the face of the dramatically rising prevalence of childhood obesity great efforts are made by parents and health professionals to promote healthy eating. In practice this means the increased consumption of vegetables and fruit and a restriction of high fat and high sugar foods. However, in accordance with Birch's studies, the accounts of the women interviewed in this study documented that food restrictions were often counterproductive both in the short and longer term. In the short-term bulimic and obese informants in particular did not comply with the restrictions and in the long-term the breaking of food restrictions became for many women a lifelong struggle. In addition, the value of prevention programs that aim at improving knowledge about healthy eating seems questionable, as even young children were aware of what was 'good' and 'bad' food. Overall the families of eating

disordered and normal informants differed less in what they ate and more in their attitudes towards food and eating. It seems that the way girls deal with eating and dieting is influenced not only by their mothers' approach towards food, but also by the nature of the mother-daughter relationship in general. Some researchers have suggested that efforts to prevent eating disorders should centre less on eating behaviours and more on improving the parent - child relationship. However, this is clearly difficult to facilitate by any kind of general prevention program.

Where there could be a realistic starting point for prevention programs is in the area of body image. One of the most significant differences between eating disordered and normal informants was the extent of teasing about weight and shape in their childhood and the negative body image that developed as a result. Any intervention that improves body image or raises awareness of the detrimental effects of teasing would be desirable. After all, many schools already have 'zero tolerance ' policies concerning bullying or racial abuse and it should be discussed whether such measures could be adopted for weight/size related teasing.

Finally the present study underlined the necessity of integrating the fields of obesity and eating disorder research as they share common denominators. It also demonstrates the usefulness of integrating both quantitative and qualitative methods of data gathering and analysis. Consequently although the aetiology of anorexia, bulimia and obesity is multifaceted, any research into their causes and any resulting prevention programs should address all of them.

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10. Appendix

I Informants

II Semi-Structured Interview

III Questionnaires

IV Information Sheets

I Informants

Anorexic Group

ID	Date of Interview
AN1	NOV 1995
AN2	NOV 1995
AN3	DEC 1995
AN4	JAN 1996
AN5	FEB 1996
AN5	JUNE 1996
AN6	AUG 1997
AN7	AUG 1997
AN8	OCT 1997
AN9	OCT 1997
AN10	NOV 1997
AN11	NOV 1997
AN12	DEC 1997
AN13	JAN 1998
AN14	NOV 1999
AN15	DEC 1999
AN17	MAY 2000
AN18	NOV 2000

Bulimic Group

ID	Date of Interview
BN1	NOV 1995
BN2	NOV 1995
BN3	NOV 1995
BN4	NOV 1995
BN5	NOV 1995
BN6	NOV 1995
BN7	DEC 1995
BN8	DEC 1995
BN9	DEC 1995
BN10	DEC 1995
BN11	JAN 1996
BN12	FEB 1996
BN13	JULY 1997
BN14	JULY 1997
BN15	SEPT 1997
BN16	SEPT 1997
BN17	FEB 1998
BN18	MAR 1999
BN19	APRIL 1999
BN20	OCT 1999
BN21	OCT 2000

Obese Group

ID	Date of Interview
O1	NOV 1995
O2	DEC 1995
O3	FEB 1996
O4	MAR 1996
O5	MAY 1996
O6	JUNE 1996
O7	JULY 1997
O8	JULY 1997
O9	AUG 997
O10	OCT 1997
O11	OCT 1997
O12	OCT 1997
O13	JUNE 1999
O14	SEPT 1999
O15	APR 2000
O16	JULY 2000
O17	SEPT 2000
O18	OCT 2000

Normal Group

ID	Date of Interview
N1	OCT 1995
N2	OCT 1995
N3	NOV 1995
N4	DEC 1995
N5	FEB 1996
N6	FEB 1996
N7	MAR 1996
N8	MAR 1996
N9	JUNE 1996
N10	JULY 1996
N11	JULY 1996
N12	JULY 1996
N13	SEPT 1997
N14	SEPT 1997
N15	NOV 1997
N16	DEC 1997
N17	DEC 1997
N18	FEB 1998
N19	JAN 2000
N20	FEB 2000

II Early Eating Behaviour

Structured Interview

Demographic Information

Name: Group:

Age:

Height: Present Weight: BMI:

Marital Status:
Children:

Profession:
Profession of Spouse:
Profession of Father:
Profession of Mother:

Living circumstances:
1= alone
2= with parents
3= with partner/married
4= single with kids
5= shared flat

Family History

Family circumstances of growing up:
1= biological parents
2= mother alone
3= father alone
4= mother and stepfather
5= father and stepmother
6= other family
7= foster/adoptive parents
8= institution
9=others

Do you have any siblings? YES/NO ☐

Brothers: ☐

Sisters: ☐

Where are you in the birth order:

Were there any other family members living with you (e.g.: grandparents)? YES/NO

If yes, were they involved in your upbringing/education? YES/NO
Specify:

How would you describe your family?
1= close family, all problems shared
2= moderately close, some problems shared
3= not close, no problems shared

What was the atmosphere at home like during your childhood:
1= warm
2= neutral
3= cold

1= relaxed
2= neutral
3= tense

Has any of your family ever had a psychiatric disorder? YES/NO
Specify:

Eating Disorder

Age at which weight started to concern you: ☐

How long have you had a problem with food and eating? ☐

What do you think were the reasons for the onset of this problem?

How did it start?

Did your parents know about your problem? YES/NO
If yes, how did they react:

Did you ever binge on large amount of food? YES/NO

If yes, what age: ☐

Did you ever induce vomiting? YES/NO

If yes, what age: ☐

Did you ever use laxatives/diet pills/diuretics?

If yes, what age: ☐

History of other eating disorders:

Did you ever receive treatment for your eating disorder? YES/NO

Eating Pattern within Family

Please describe the shape of other family members using the scale below.
1=very thin 2=slim 3=normal 4=plump 5=obese

Mother:

now: ☐

in your childhood: ☐

Father

now: ☐

in your childhood: ☐

Sibling 1

now: ☐

in your childhood: ☐

Sibling 2

now: ☐

in your childhood: ☐

Sibling 3

now: ☐

in your childhood: ☐

Sibling 4

now: ☐

in your childhood: ☐

If you think back to the time you went to primary school how would you describe a typical meal situation in your family?

Did you eat together as a family? YES/NO

Do you remember these mealtimes as being
1= Happy
2= Neutral
3= Stressful

If you think of an typical meal what would you eat for:
Breakfast:

Lunch:

Dinner:

Was there a great variety of different kind of foods available? YES/NO

Did you use to 'experiment' with food? YES/NO

Where there set times when you used to eat? YES/NO

What would happen if you were hungry in between meals?

Would you say that food and eating were important issues in your family? YES/NO

When you were a child how concerned were your parents about your weight and shape?
1= extremely concerned
2= very concerned
3= concerned
4= slightly concerned
5= not concerned at all

How concerned were your parents about their own weight and shape?
Mother:
1= extremely concerned
2= very concerned
3= concerned
4= slightly concerned
5= not concerned at all
6= D/K

Father:
1= extremely concerned
2= very concerned
3= concerned
4= slightly concerned
5= not concerned at all
6=D/K

Can you remember any rules about food and eating in your family?
Specify:

How strictly were these rules enforced?

1=never 2=occasional 3=frequently 4=always

Was food used as a **reward** in your family: ☐
Please describe an example :

Was food ever used as reward if you ate something you didn't particularly like?
Specify:

Was the withholding of food used as a **punishment**? ☐
Example:

Were you made to **finish** at mealtimes: ☐

Who chose how much was on the plate?

What would happen if you didn't finish?

Was your food intake **restricted** by your parents: ☐

What kind of food was restricted?

What was the reasons for that ?

Did you go along with these restrictions?
Specify:

Were there ever times when you were **forbidden** to eat certain foods: ☐

What was it?

What were the reasons?

Did you have food **fads**: ☐

What kind of food?

How long did this last?

How did your parents deal with this?

The following questions are not only about your childhood but also about later events and attitudes:

Dieting within family:

Mother:	YES/NO
Successful in doing so?	YES/NO
Father:	YES/NO
Successful:	YES/NO
Sibling 1:	YES/NO
Successful:	YES/NO
Sibling 2:	YES/NO
Successful:	YES/NO
Sibling 3:	YES/NO
Successful:	YES/NO
Sibling 4:	YES/NO
Successful:	YES/NO

Did your parents ever put you on a diet: YES/NO

Did you ever diet: YES/NO

Age first episode: ☐

Reasons for onset of dieting:

Has anybody in your family ever had an eating disorder? YES/NO
If yes, specify:

Did anyone in your family ever receive treatment for an eating disorder? YES/NO

Are other family members satisfied with their eating behaviours? YES/NO
If no, specify:

Is your own eating behaviour particularly similar to another family member?
YES/NO
Specify:

Is your own eating behaviour particularly different from another family member?
YES/NO
Specify:

To give a general idea what food and eating in your family was like when you were a child, could you describe for me any images, situations, or characteristics that come to mind?
1.

2.

3.

4.

Own Eating History

Where you born :
1=prematurely
2=on time
3=late

Number of weeks : ☐

Birth weight:

Were you breast fed ? YES/NO/DK

How long were you breast fed?

Were your siblings fed in the same way? YES/NO
If not, why not?

How do your parents describe your eating pattern as a child?

What is your earliest recollection connected with food and eating? (How old were you?)

Were there any particular problems with food or eating when you were a child? YES/NO

Specify:

Were there any problems with
Food allergies YES/NO
Age:
Colics or other gastrointestinal problems YES/NO
Age:
Refusal to eat: YES/NO
Age:
Picky eating: YES/NO
Age:
Pica (eating strange foods like chalk or sand for example): YES/NO
Age:
What was the main strategy of your parents in response to these eating problems?
1= rewards
2= sanctions/punishment
3= no response
4= other (specify)

Was there any specific food which you <u>strongly</u> disliked as a child? YES/NO
Specify:

Shellfish (Specify:.....) YES/NO

Drink (Specify:.....) YES/NO

Vegetables (Specify:.....) YES/NO

Meat (Specify:.....) YES/NO

Sauce (Specify:.....) YES/NO

Canned Food (Specify:.....) YES/NO

Other: YES/NO

Which of the above dislikes are still present?

Can you remember any arguments about food and eating with your parents when you were a child? How old were you?

Can you remember having any favourite food? YES/NO
Specify:
Age:
How did that change:

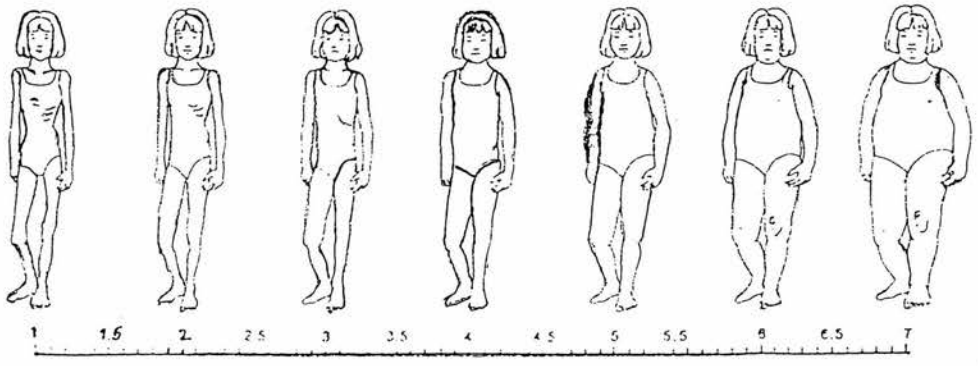
Were you parents happy with the kind of food you ate?

Were you parents happy with the amount of food you ate?
1= too much
2= right amount
3= too little

Was your eating pattern different from that of your siblings? YES/NO
If yes, specify:

Body Image

When you were in primary school what was your body shape like?



What would have been your 'ideal' body shape as a child?(see pictures)

How satisfied were you with the way you looked as a child?
1= very happy
2= happy
3= satisfied
4= not satisfied
5= hated the way you looked

What is the first comment you can remember about the way you looked?

Did your parents ever criticise the way you looked?
1=never
2= occasionally
3= often
4= almost all the time

What did they criticise and how old were you?

Did other people criticise the way you looked or tease you about your appearance?
1=never
2= occasionally
3= often
4= almost all the time

What did they say and how old were you?
How many close friends did you have as a child?

Did you have something like a best friend?

At what age did you reach puberty?

In comparison with class mates/ friends did you feel (please delete as appropriate):
taller/smaller/the same
lighter/heavier/the same
more pretty/less pretty/the same
more developed /less developed/the same
more feminine/less feminine/the same
Other differences:

Did you have any friends who dieted? How many?	YES/NO
Did any of your friends binge?	YES/NO
Did any of your friends induce vomiting?	YES/NO
Did any of your friends have an eating disorder?	YES/NO

P.A.R.T.S.

(PHYSICAL APPEARANCE RELATED TEASING SCALE)

Each question pertains to the time period when you were growing up. Please respond by circling the appropriate number on the following scale: Never (1), → Frequently (5).

1. When you were a child, did you feel that peers were staring at you because you were overweight? 1 2 3 4 5
2. When you were a child, did you ever feel like people were making fun of you because of your weight? 1 2 3 4 5
3. Were you ridiculed as a child about being overweight? 1 2 3 4 5
4. When you were a child, did people make jokes about your being too big? 1 2 3 4 5
5. When you were a child, were you laughed at for trying out sports because you were too heavy? 1 2 3 4 5
6. Did your brother(s) or other male relatives call you names like "fatso" when they got angry at you? 1 2 3 4 5
7. Did your father ever make jokes that referred to your weight? 1 2 3 4 5
8. Did other kids call you derogatory names that related to your size or weight? 1 2 3 4 5
9. Did you ever feel like people were pointing at you because of your sizeor weight? 1 2 3 4 5
10. Were you the butt of family jokes because of your weight? 1 2 3 4 5
11. Did people point you out in a crowd because of your weight? 1 2 3 4 5
12. Did you ever hear you classmates snicker when you walked into the classroom alone? 1 2 3 4 5
13. When you were growing up, did people say you dressed funny? 1 2 3 4 5
14. Did people say you had funny teeth? 1 2 3 4 5
15. Did kids call you funny looking? 1 2 3 4 5
16. Did other kids tease you about wearing clothes that didn't match or were out of style? 1 2 3 4 5
17. Did other kids ever make jokes about your hair? 1 2 3 4 5
18. When you were a child, were you scoffed at for looking like a weakling? 1 2 3 4 5
19. Did your sister(s) or other female relatives call you names like "fatso" when they got angry at you? 1 2 3 4 5
20. Did your mother ever make jokes that referred to your weight? 1 2 3 4 5

PARENTAL BONDING INSTRUMENT

This questionnaire lists various attitudes and behaviours of parents. As you remember your father in your first 16 years would you place a tick in the most appropriate brackets next to each question.

	Very like	Moderately like	Moderately unlike	Very unlike
1. Spoke to me in a warm and friendly voice	( )	( )	( )	( )
2. Did not help me as much as I needed	( )	( )	( )	( )
3. Let me do those things I liked doing	( )	( )	( )	( )
4. Seemed emotionally cold to me	( )	( )	( )	( )
5. Appeared to understand my problems and worries	( )	( )	( )	( )
6. Was affectionate to me	( )	( )	( )	( )
7. Liked me to make my own decisions	( )	( )	( )	( )
8. Did not want me to grow up	( )	( )	( )	( )
9. Tried to control everything I did	( )	( )	( )	( )
10.Invaded my privacy	( )	( )	( )	( )
11.Enjoyed talking things over with me	( )	( )	( )	( )
12.Frequently smiled at me	( )	( )	( )	( )
13.Tended to baby me	( )	( )	( )	( )
14.Did not seem to understand what I needed or wanted	( )	( )	( )	( )
15. Let me decide things for myself	( )	( )	( )	( )
16.Made me feel I wasn't wanted	( )	( )	( )	( )
17.Could make me feel better when I was upset	( )	( )	( )	( )
18.Did not talk to me very much	( )	( )	( )	( )
19.Tried to make me feel depended on his	( )	( )	( )	( )
20. Felt I could not look after myself unless he was around	( )	( )	( )	( )
21.Gave me as much freedom as I wanted	( )	( )	( )	( )
22.Let me get out as often as I wanted	( )	( )	( )	( )
23. Was overprotective of me	( )	( )	( )	( )
24.Did not praise me	( )	( )	( )	( )
25.Let me dress in any way I pleased	( )	( )	( )	( )

PARENTAL BONDING INSTRUMENT

This questionnaire lists various attitudes and behaviours of parents. As you remember your mother in your first 16 years would you place a tick in the most appropriate brackets next to each question.

	Very like	Moderately like	Moderately unlike	Very unlike
1. Spoke to me in a warm and friendly voice	( )	( )	( )	( )
2. Did not help me as much as I needed	( )	( )	( )	( )
3. Let me do those things I liked doing	( )	( )	( )	( )
4. Seemed emotionally cold to me	( )	( )	( )	( )
5. Appeared to understand my problems and worries	( )	( )	( )	( )
6. Was affectionate to me	( )	( )	( )	( )
7. Liked me to make my own decisions	( )	( )	( )	( )
8. Did not want me to grow up	( )	( )	( )	( )
9. Tried to control everything I did	( )	( )	( )	( )
10.Invaded my privacy	( )	( )	( )	( )
11.Enjoyed talking things over with me	( )	( )	( )	( )
12.Frequently smiled at me	( )	( )	( )	( )
13.Tended to baby me	( )	( )	( )	( )
14.Did not seem to understand what I needed or wanted	( )	( )	( )	( )
15. Let me decide things for myself	( )	( )	( )	( )
16.Made me feel I wasn't wanted	( )	( )	( )	( )
17.Could make me feel better when I was upset	( )	( )	( )	( )
18.Did not talk to me very much	( )	( )	( )	( )
19.Tried to make me feel depended on her	( )	( )	( )	( )
20. Felt I could not look after myself unless she was around	( )	( )	( )	( )
21.Gave me as much freedom as I wanted	( )	( )	( )	( )
22.Let me get out as often as I wanted	( )	( )	( )	( )
23. Was overprotective of me	( )	( )	( )	( )
24.Did not praise me	( )	( )	( )	( )

PATIENT NAME:

DATE:

BULIMIC INVESTIGATORY TEST, EDINBURGH (BITE)

1	Do you have a regular day to day eating pattern?	YES/NO
2	Are you a strict dieter?	YES/NO
3	Do you feel a failure if you break your diet once?	YES/NO
4	Do you count the calories of everything you eat, even when not on a diet?	YES/NO
5	Do you ever fast for a whole day?	YES/NO

6 If yes, how often is this?

EVERY SECOND DAY - 5 2-3 TIMES A WEEK - 4
ONCE A WEEK - 3 NOW AND THEN - 2 HAVE ONCE - 1

7 Do you do any of the following to help you lose weight? (Circle number)

	NEVER	OCCASION-ALLY	ONCE A WEEK	2-3 TIMES WEEK	DAILY	2-3 TIMES A DAY	5+TIMES A DAY
TAKE DIET PILLS	0	2	3	4	5	6	7
TAKE DIURETICS	0	2	3	4	5	6	7
TAKE LAXATIVES	0	2	3	4	5	6	7
MAKE YOURSELF VOMIT	0	2	3	4	5	6	7

8	Does your pattern of eating severely disrupt your life?	YES/NO
9	Would you say that food dominated your life?	YES/NO
10	Do you ever eat and eat until you are stopped by physical discomfort?	YES/NO
11	Are there times when all you can think about is food?	YES/NO
12	Do you eat sensibly in front of others and make up in private?	YES/NO
13	Can you always stop eating when you want to?	YES/NO

PATIENT NAME

DATE

BULIMIC INVESTIGATORY TEST, EDINBURGH (BITE) CONT'D

14	Do you ever experience overpowering urges to eat and eat and eat?	YES/NO
15	When you are feeling anxious do you tend to eat a lot?	YES/NO
16	Does the thought of becoming fat terrify you?	YES/NO
17	Do you ever eat large amounts of food rapidly? (not a meal)	YES/NO
18	Are you ashamed of your eating habits?	YES/NO
19	Do you worry that you have no control over how much you eat?	YES/NO
20	Do you turn to food for comfort?	YES/NO
21	Are you able to leave food on the plate at the end of a meal?	YES/NO
22	Do you deceive other people about how much you eat?	YES/NO
23	Does how hungry you feel determine how much you eat?	YES/NO
24	Do you ever binge on large amounts of food?	YES/NO
25	If yes, do such binges leave you feeling miserable	YES/NO
26	If you do binge, is this only when you are alone?	YES/NO
27	If you do binge, how often is this?	

HARDLY EVER	1	ONCE A MONTH	2
ONCE A WEEK	3	2-3 TIMES A WEEK	4
DAILY	5	2-3 TIMES A DAY	6

28	Would you go to great lengths to satisfy an urge to binge?	YES/NO
29	If you overeat do you feel very guilty?	YES/NO
30	Do you ever eat in secret?	YES/NO
31	Are your eating habits what you would consider to be normal?	YES/NO
32	Would you consider yourself to be a compulsive eater?	YES/NO
33	Does your weight fluctuate by more than 5 lbs in a week?	YES/NO

EDI

(EATING DISORDER INVENTORY)

INSTRUCTIONS

This is a scale which measures a variety of attitudes, feelings and behaviours. Some of the items relate to food and eating. Others ask you about your feelings about yourself. THERE ARE NO RIGHT OR WRONG ANSWERS, SO TRY VERY HARD TO BE COMPLETELY HONEST IN YOUR ANSWERS. RESULTS ARE COMPLETELY CONFIDENTIAL. Read each question and **circle the number under the column which applies best to you.** Please answer each question *very* carefully. Thank you.

	ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER	
1. I eat sweets and carbohydrates without feeling nervous.	0	1	2	3	4	5	21
2. I think that my stomach is too big.	0	1	2	3	4	5	22
3. I wish that I could return to the security of childhood.	0	1	2	3	4	5	23
4. I eat when I am upset.	0	1	2	3	4	5	24
5. I stuff myself with food.	0	1	2	3	4	5	25
6. I wish that I could be younger.	0	1	2	3	4	5	26
7. I think about dieting.	0	1	2	3	4	5	27
8. I get frightened when my feelings are too strong.	0	1	2	3	4	5	28
9. I think that my thighs are too large.	0	1	2	3	4	5	29
10. I feel ineffective as a person.	0	1	2	3	4	5	30
11. I feel extremely guilty after over-eating.	0	1	2	3	4	5	31
12. I think that my stomach is just the right size.	0	1	2	3	4	5	32
13. Only outstanding performance is good enough in my family.	0	1	2	3	4	5	33
14. The happiest time in life is when you are a child.	0	1	2	3	4	5	34
15. I am open about my feelings.	0	1	2	3	4	5	35
16. I am terrified of gaining weight.	0	1	2	3	4	5	36
17. I trust others.	0	1	2	3	4	5	37
18. I feel alone in the world.	0	1	2	3	4	5	38
19. I feel satisfied with the shape of my body.	0	1	2	3	4	5	39
20. I feel generally in control of things in my life.	0	1	2	3	4	5	40
21. I get confused about what emotion I am feeling.	0	1	2	3	4	5	41
22. I would rather be an adult than a child.	0	1	2	3	4	5	42
23. I can communicate with others easily.	0	1	2	3	4	5	43
24. I wish I were someone else.	0	1	2	3	4	5	44
25. I exaggerate or magnify the importance of weight.	0	1	2	3	4	5	45
26. I can clearly identify what emotion I am feeling.	0	1	2	3	4	5	46
27. I feel inadequate.	0	1	2	3	4	5	47
28. I have gone on eating binges where I have felt that I could not stop.	0	1	2	3	4	5	48
29. As a child, I tried very hard to avoid disappointing my parents and teachers.	0	1	2	3	4	5	49
30. I have close relationships.	0	1	2	3	4	5	50

EDI (cont'd)

(EATING DISORDER INVENTORY)

	ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER	
31. I like the shape of by buttocks.	0	1	2	3	4	5	21
32. I am preoccupied with the desire to be thinner.	0	1	2	3	4	5	22
33. I don't know what's going on inside me.	0	1	2	3	4	5	23
34. I have trouble expressing my emotions to others.	0	1	2	3	4	5	24
35. The demands of adulthood are too great.	0	1	2	3	4	5	25
36. I hate being less than best at things.	0	1	2	3	4	5	26
37. I feel secure about myself.	0	1	2	3	4	5	27
38. I think about bingeing (over-eating).	0	1	2	3	4	5	28
39. I feel happy that I am not a child anymore.	0	1	2	3	4	5	29
40. I get confused as to whether or not I am hungry.	0	1	2	3	4	5	30
41. I have a low opinion of myself.	0	1	2	3	4	5	31
42. I feel that I can achieve my standards.	0	1	2	3	4	5	32
43. My parents have expected excellence of me.	0	1	2	3	4	5	33
44. I worry that my feelings will get out of control.	0	1	2	3	4	5	34
45. I think that my hips are too big.	0	1	2	3	4	5	35
46. I eat moderately in front of others and stuff myself when they're gone.	0	1	2	3	4	5	36
47. I feel bloated after eating a normal meal.	0	1	2	3	4	5	37
48. I feel that people are happiest when they are children.	0	1	2	3	4	5	38
49. If I gain a pound, I worry that I will keep gaining.	0	1	2	3	4	5	39
50. I feel that I am a worthwhile person.	0	1	2	3	4	5	40
51. When I am upset, I don't know if I am sad, frightened, or angry.	0	1	2	3	4	5	41
52. I feel that I must do things perfectly, or not do them at all.	0	1	2	3	4	5	42
53. I have the thought of trying to vomit in order to lose weight.	0	1	2	3	4	5	43
54. I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).	0	1	2	3	4	5	44
55. I think that my thighs are just the right size.	0	1	2	3	4	5	45
56. I feel empty inside (emotionally).	0	1	2	3	4	5	46
57. I can talk about personal thoughts or feelings.	0	1	2	3	4	5	47
58. The best years of your life are when you become an adult.	0	1	2	3	4	5	48
59. I think that my buttocks are too large.	0	1	2	3	4	5	49
60. I have feelings that I can't quite identify.	0	1	2	3	4	5	50
61. I eat or drink in secrecy.	0	1	2	3	4	5	51
62. I think that my hips are just the right size.	0	1	2	3	4	5	52
63. I have extremely high goals.	0	1	2	3	4	5	53
64. When I am upset, I worry that I will start eating.	0	1	2	3	4	5	54

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Cullen Centre
Department of Psychotherapy

EATING ATTITUDES TEST

Name: ..... Date ..... Therapist .....

Please place an 'X' under the column which applies best to each of the numbered statements. Most of the questions directly relate to food or eating although other types of questions have been included. Please answer each question carefully. Thank you.

	Always	Very often	Often	Sometimes	Rarely	Never
1. Like eating with other people.	....	....	....	....	....	....
2. Prepare foods for others but do not eat what I cook.	....	....	....	....	....	....
3. Become anxious prior to eating.	....	....	....	....	....	....
4. Am terrified about being overweight.	....	....	....	....	....	....
5. Avoid eating when I am hungry.	....	....	....	....	....	....
6. Find myself preoccupied with food.	....	....	....	....	....	....
7. Have gone on eating binges where I feel that I may not be able to stop.	....	....	....	....	....	....
8. Cut my food into small pieces.	....	....	....	....	....	....
9. Aware of the calorie content of foods that I eat.	....	....	....	....	....	....
10. Particularly avoid foods with a high carbohydrate content (e.g. bread, potatoes, rice etc.)	....	....	....	....	....	....
11. Feel bloated after meals.	....	....	....	....	....	....
12. Feel that others would prefer if I ate more.	....	....	....	....	....	....
13. Vomit after I have eaten.	....	....	....	....	....	....
14. Feel extremely guilty after eating.	....	....	....	....	....	....
15. Am preoccupied with a desire to be thinner.	....	....	....	....	....	....
16. Exercise strenuously to burn off calories.	....	....	....	....	....	....
17. Weigh myself several times a day.	....	....	....	....	....	....

	Always	Very often	Often	Sometimes	Rarely	Never
18. Like my clothes to fit tightly.	....	....	....	....	....	....
19. Enjoy eating meat.	....	....	....	....	....	....
20. Wake up early in the morning.	....	....	....	....	....	....
21. Eat the same foods day after day.	....	....	....	....	....	....
22. Think about burning up calories when I exercise.	....	....	....	....	....	....
23. Have regular menstrual periods.	....	....	....	....	....	....
24. Other people think that I am too thin.	....	....	....	....	....	....
25. Am preoccupied with the thought to having fat on my body.	....	....	....	....	....	....
26. Take longer than others to eat my meals.	....	....	....	....	....	....
27. Enjoy eating at restaurants.	....	....	....	....	....	....
28. Take laxatives.	....	....	....	....	....	....
29. Avoid foods with sugar in them.	....	....	....	....	....	....
30. Eat diet foods.	....	....	....	....	....	....
31. Feel that food controls my life.	....	....	....	....	....	....
32. Display self control around food.	....	....	....	....	....	....
33. Feel that others pressure me to eat.	....	....	....	....	....	....
34. Give too much time and thought to food.	....	....	....	....	....	....
35. Suffer from constipation.	....	....	....	....	....	....
36. Feel uncomfortable about eating sweets.	....	....	....	....	....	....
37. Engage in dieting behaviour.	....	....	....	....	....	....
38. Like my stomach to be empty.	....	....	....	....	....	....
39. Enjoy trying new rich foods.	....	....	....	....	....	....
40. Have the impulse to vomit after meals.	....	....	....	....	....	....

Subject Information Sheet

Early Eating Pattern of Women with Eating Disorders

In this study we want to ask women with eating disorders (e.g.: anorexia, bulimia, or severe obesity) about how they experienced food and eating in their original family, and to compare these recollections with those of women who have never suffered from an eating disorder.

Who can take part in this study?

We are looking for women between the age of 18 to 35 who have, or have had:

a) anorexia nervosa
b) bulimia nervosa
c) severe obesity
d) no history of any form of eating disorder

What does this study involve?

If you agree to take part in this study, you will be invited to a meeting with me, arranged at your convenience. This meeting will include an interview about your and your family's eating patterns, general family history, attitudes towards food and eating, and body image. You will be also asked to fill in some questionnaires about these topics. This meeting lasts about 90 minutes. We would also like to interview the mothers and sisters of women who take part, but of course this would only happen with your consent. Information from the interview and questionnaires will be strictly confidential, and will not be shared with other family members interviewed. Taking part in this study is completely voluntary and you can withdraw at any time from the study. The decision whether or not to take part in this study won't affect any treatment you may be involved in.

If you would like to help us with our research or would like to know more about this study please contact :

Constanze Schulz
University of Edinburgh
Royal Edinburgh Hospital
Morningside Place
Tel: 0131 537 6371

Consent Form

EARLY EATING PATTERN OF WOMEN WITH EATING DISORDERS

Name of Investigator: Constanze Schulz

Address: Royal Edinburgh Hospital
Morningside Terrace
Edinburgh
EH10 5HF

Telephone: 0131-537 6371

Further information is available from (a person who is not involved in the trial):

Dr Helen Cash
Registrar
Royal Edinburgh Hospital

I agree to participate in this study.

I have read this consent form and the Subject Information Sheet, and had the opportunity to ask questions about them.

I understand that I am under no obligation to take part in this study and that a decision not to participate will not alter the treatment that I would normally receive.

I understand that I have the right to withdraw from this study at any stage and that to do so will not affect my treatment.

Signature:.....

Name of subject:.....

Signature of Investigator: ..... Date:.....

1 copy to be retained by Investigator
1 copy to be retained by Subject