Associations Among Obesity-Related Guilt, Shame, and Coping

Dissertation
zur Erlangung des Doktorgrades der Naturwissenschaften (Dr. rer. nat.),
dem Fachbereich Psychologie der Philipps-Universität Marburg
vorgelegt von

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Marburg/Lahn, 2008

Vom Fachbereich Psychologie der Philipps-Universität Marburg als Dissertation am 15.12.2008 angenommen.

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Tag der mündlichen Prüfung am 18.12.2008

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Abbreviations

APA	American Psychological Association
BIG-SS	Body Image Guilt and Shame Scale
BMI	Body mass index
CES-D-S	Center for Epidemiological Studies Depression Scale Short Form
CFA	Confirmatory factor analysis
CFI	Comparative fit index
Com	Communalities
CSI-S	Coping Strategies Inventory Short Form
DEBQ-R	Dutch Eating Behavior Questionnaire Revised
DSM-III-R	Diagnostic and Statistical Manual of Disorders III Revised
ED	Emotion-focused disengagement
EE	Emotion-focused engagement
EFA	Exploratory factor analysis
FC	Coefficient of congruency
FH	Hypercholesterolemia
FP	Familial predisposition
G	General consultation
GG	Genetic consultation
GP	General practitioner
ICC	Intraclass correlation indices
LCD	Low calorie diet
MINRES	Minimal residual
ML	Maximum likelihood
MOMO	Macrosomia, obesity, macrocephaly, ocular (abnormalities)
NFP	No familial predisposition
PD	Problem-focused disengagement
PE	Problem-focused engagement
PTSD	Posttraumatic stress disorder
RMSEA	Root-mean-square error of approximation
SCL-90-R	Sympom-Checklist-90-Revised
SES	Socioeconomic status
SG	Shame and Guilt Concerning Eating Scale

SG-Distress	Distress about shame and guilt feelings
SPSS	Statistical Package for Social Sciences
SRMR	Standardized root-mean-square residual
T1	Time 1
T2	Time 2
VLCD	Very low calorie diet
WEB-SG	Weight- and Body-Related Shame and Guilt Scale
WHR	Waist-to-hip ratio
β3AR	β3-adrenergic receptor

Preliminary Comments

The first chapter contains an introduction to epidemiological aspects, etiology, associated problems, and treatment of obesity. Further, the theoretical backgrounds of the main constructs of this doctoral thesis are outlined: guilt, shame, coping, and feedback about genetic susceptibility in obesity. The second chapter provides a short overview of the main aims, hypotheses, and employed methods of the three research manuscripts. The third, fourth, and fifth chapter each consist of a publication-based manuscript. The three manuscripts have already been published in peer reviewed journals (see below). The sixth chapter contains a summary of the published results and further research implications of the findings. The appendix lists the materials used in this study including all assessment measures and formulas. In addition, further analyses and results are presented which could not be included in the publications.

Because the published manuscripts were submitted in the English language, it seemed logical to also write the introduction and discussion in English. For reasons of standardization, a German summary is included. Citations are managed throughout the thesis, although a reference list for each manuscript is given for a better overview (chapter 3.5, 4.5, and 5.5). The headings are not compliant with the publication standards of the American Psychological Association (APA).

Publications

Conradt, M., Dierk, J.-M., Schlumberger, P., Rauh, E., Hebebrand, J., & Rief, W. (2007). Development of the weight- and body-related shame and guilt scale (WEB-SG) in a nonclinical sample of obese subjects. *Journal of Personality Assessment, 88*, 317-327.

Conradt, M., Dierk, J.-M., Schlumberger, P., Rauh, E., Hebebrand, J., & Rief, W. (2008). Who copes well? Obesity-related coping and its associations with shame, guilt, and weight loss. *Journal of Clinical Psychology, 64*, 1129-1144.

Conradt, M., Dierk, J.-M., Schlumberger, P., Albohn, C., Rauh, E., Hinney, A., Hebebrand, J., & Rief, W. (in press). A consultation with genetic information about obesity decreases self-blame about eating and yields to realistic weight loss goals in obese individuals. *Journal of Psychosomatic Research.*

Acknowledgements

In the process of writing this doctoral thesis, I was supported by a number of people to whom I would like to express my gratitude.

I would like to thank Prof Dr Winfried Rief for his optimism, the practical, clear handling of theoretical issues, and his desirable determination to publish. I am grateful for all the personal support and advice I received from my colleagues Dr Jan Michael Dierk, Dr Pia Schlumberger, Dr Elisabeth Rauh, Dr Cornelia Exner, and Dr Alexandra Martin.

I also appreciate the work Chelsea Friend and Jennifer Budde put into correcting my English manuscripts. Thank you to Dr Anke Beyer and Dr Jutta Hagen for correcting the final version of the manuscript. Also, I would like to thank my sister Bine for her helpful guidance on layout issues and Barbara, Jörg, and Tine for their constant encouragement.

Above all, my deepest gratitude goes to MS.

Preface

If humans were machines, the treatment formula for obesity would be simple and easily put into practice: to empty the energy tank, one has to refill less and expend more. But humans are not machines. This makes it harder for obese individuals to establish behavioral recommendations in everyday life which were derived from a rather technical-medical understanding: eat less calories, exercise more, and the weight loss varies depending on ones genetic predisposition. According to longitudinal studies, this statement is valid. And its simplicity implies that eating differently and exercising more is easy to accomplish. As one might know from research or personal experience, it is not.

Obesity can be viewed as a psychological rather than a medical problem. The simplicity of the behavioral recommendations for obesity contradicts the finding that only a minority of those engaging in weight loss activities succeed long-term. This contradiction brings up a few explanatory questions in obese and nonobese persons which are mostly answered in the suggested way: (a) What are the main reasons for overweight? Eating habits and lack of exercise; (b) is it possible to lose weight? Yes, through a change of eating habits and more exercise; (c) who is to blame when weight loss attempts are not successful? The individual. Some obese individuals, for whom weight loss is an important goal but who do not manage to lose weight, feel confronted with these questions on a regular basis and might be prone to experience intense negative emotions: guilt about their daily transgressions against behavioral standards and shame about being obese. This doctoral thesis suggests that these self-conscious emotions are the key for the question why only some individuals suffer from being obese whereas others do not. Furthermore, guilt and shame are hypothesized to influence the way of coping with obesity-related everyday situations and the ability to lose weight.

1 Theoretical Background

This chapter introduces the definition and measurement of obesity, epidemiological and etiological aspects, associated physical and psychological problems, and possible treatments of obesity. Furthermore, definitions and empirical evidence are reported for pivotal constructs of this study, which are guilt and shame, coping, and feedback about genetic susceptibility in obesity.

1.1 Obesity

1.1.1 Definition, Measurement, and Classification

According to Lehrke and Laessle (2002), obesity is defined as an increase in fatty tissue to a point where it exceeds a certain percentage of the total body weight and where it has shown to be associated with certain health risks or increased mortality. Generally, men with 25% body fat and women with more than 30% body fat are considered obese. Current research differentiates between primary (or simple) and secondary obesity (Kiess et al., 2001). Primary obesity originates from an imbalance between energy uptake and energy expenditure – with the energy uptake exceeding the energy consumption. Secondary obesity refers to the existence of a primary cause such as endocrine, central nervous, genetic, and drug-induced obesity. The prevalence of secondary obesity does not exceed 5% of the obese population; the most prevalent examples being Prader-Willi and Leptin deficit syndromes, or Hypothyroidism (Benecke & Vogel, 2003).

Obesity is typically evaluated by measuring the body mass index (BMI) which is calculated by dividing the individual's weight by the square of his or her height (kg/m^2). The World Health Organization (WHO) agreed on the current definitions commonly in use which are presented in Table 1.1. Therefore, a BMI above 30 indicates the diagnosis of a clinically relevant obesity (WHO, 2000). According to Laessle, Lehrke, Wurmser, and Pirke (2001), the BMI is a valid measure for the estimation of body fat and meets the criteria of being highly correlated with the amount of fatty tissue (95%) and being uncorrelated with body height. Nevertheless, one has to consider age, sex, race, muscularity and other factors when interpreting the BMI of an individual. Regarding children and

adolescents, the use of age percentiles is recommended rather than the BMI since it underestimates the percentage of lean tissue within this range of age. Another common way of estimating the percentage of body fat is the Skinfold Test. The thickness of the subcutaneous fat layer, measured by a pinching device, is a marker for the percentage of body fat. There are certainly more precise measurement techniques for the estimation of the percentage of fatty tissue, such as bioelectric impedance analysis, underwater weighing, computer tomography, or magnetic resonance imaging. All these methods are expensive and their use is limited to the accessibility of the equipment. Therefore, they are not convenient for studies investigating larger samples.

To take the distribution of body fat into account, the waist-hip-ratio (WHR) for assessing central obesity is used. It is calculated by dividing waist circumstance by hip circumstance. WHR is known to be associated with cardiovascular disease risk (Yusuf et al., 2004) and increased total health care charges (Cornier, Tate, Grunwald, & Bessesen, 2002), whereas the associations of the BMI to these variables are much smaller. For males, the WHR should be smaller than 1, for females smaller than .85.

Table 1.1

Current Definitions of Body Weight

Body mass index	Definition
< 18.5	underweight
18.5 – 24.9	normal weight
25.0 – 29.9	overweight
30.0 – 34.9	obesity grade I
35.0 – 39.9	obesity grade II
> 40.0	obesity grade III

1.1.2 Epidemiology

1.1.2.1 Prevalence and Incidence

Obesity and overweight are considered to be global issues. According to Yach, Stuckler, and Brownell (2006), the worldwide obesity prevalence in the year 2002 was 5.7% for males and 9.4% for females, the estimations for the year 2010 were 8.0% for males and 12.3% for females (see Table 1.2).

Table 1.2

Adult Obesity in 2002 and Estimated Level in 2010, Expressed as Percentage of People ≥ 15 Years of Age with a BMI ≥ 30

	2002		2010	
Country	Males	Females	Males	Females
Bangladesh	0.1	0.1	0.2	0.2
Brazil	6.9	15.0	12.4	24.5
China	1.0	1.5	4.1	3.6
India	0.9	1.1	1.7	2.0
Indonesia	0.2	2.0	0.2	3.9
Japan	1.5	1.5	2.3	1.1
Malaysia	1.6	6.8	1.7	11.0
Mexico	20.3	31.6	30.1	41.0
Nigeria	1.6	4.9	3.0	8.1
Pakistan	0.8	2.9	1.6	5.0
United States	32.0	37.8	44.2	48.3
World	5.7	9.4	8.0	12.3
High income[a]	18.1	20.4	24.3	25.9
Upper middle income	14.0	21.1	19.7	29.0
Lower middle income	4.1	9.9	6.6	12.6
Low income	1.1	2.8	1.7	4.2

Note. Table from "Epidemiologic and economic consequences of the global epidemics of obesity and diabetes" by D. Yach, D. Stuckler, and K. D. Brownell, 2006, *Nature Medicine, 12*, p. 62. Copyright 2006 by the Nature Publishing Group. Reprinted with permission of the author. [a]World Bank Income Groups (figures in US dollars): high income, ≥ 9,206; upper middle income, 2,976-9,205; lower middle income, 746-2,975; low income, ≤ 745. Data sources: *World Development Indicators*, World Bank, Washington DC, 2003; *SuRF 2 Report*, World Health Organization, Geneva, 2005; *Global InfoBase*, World Health Organization, Geneva, 2005.

Recent studies suggest increasing prevalence and incidence rates of overweight and obesity on almost all continents including the Asia-Pacific Region (Asia Pacific Cohort Studies Collaboration, 2007), North America (Baskin, Ard, Franklin, & Allison, 2005; Bélanger-Ducharme & Tremblay, 2005), Latin America (Filozof, Gonzalez, Sereday, Mazza, & Braguinsky, 2001), and Europe (Lobstein & Millstone, 2007). Especially in youth and adolescence the percentage of obese individuals is rapidly growing (Janssen et al., 2005; Lobstein & Frelut, 2003), even in developing countries (Kelishadi, 2007). According to

Mensink, Lampert, and Bergmann (2005), every other individual in Germany is overweight, every fifth individual is considered obese.

1.1.2.2 Sociodemographic Correlates

As can be seen in Table 1.2, prevalence rates of obesity are associated with income and wealth. Western countries, like the United States, show the highest prevalence rates ranging from 20% to 40% obese inhabitants, whereas developing countries are far below that benchmark. Within western societies, the association between BMI and socioeconomic status (SES) is reverse: the lower the SES, the higher the prevalence of obesity. In Germany, for example, the prevalence of obesity for low SES was 31.4% for females and 22.3% for males, whereas for high SES the prevalence rates were 9.9% and 16.2%, respectively (Knopf, Ellert, & Melchert, 1999). The results of a multivariate genetic study suggested that these disparities in BMI are education-associated and moderated by a common genetic factor, namely intelligence (Silventoinen, Sarlio-Lähteenkorva, Koskenvuo, Lahelma, & Kapro, 2004).

The prevalence of obesity also varies with age and sex (Benecke & Vogel, 2003). The average weight of the population increases steadily during the life span and decreases again at old age. Regarding sex, obesity is equally prevalent in males and females in the range between 30 to 60 years of age, whereas obesity in old age (> 60 years) is more prevalent in females. In the MONICA Project, trends in 21 countries were observed over ten years: Results indicated that three quarters of the male population showed an increase in levels of BMI, whereas only half of the study centers showed an increase for females (A. Evans et al., 2001).

1.1.2.3 Comorbidity and Mortality

Obesity is associated with an increased risk for bodily symptoms and syndromes. Physical complications can be cardiovascular, gastrointestinal, endocrine, musculoskeletal, respiratory, or even renal and genitourinary (Benecke & Vogel, 2003). Also, obese individuals are more likely to experience pain in multiple locations (Hitt, McMillen, Thornton-Neaves, Koch, & Cosby, 2007). There is empirical evidence that high BMI is associated with increased mortality rates: the

higher the BMI, the more increased the odds ratios (Engeland, Bjørge, Tverdal, & Søgaard, 2004). Especially adult obesity is associated with excess mortality. Even after adjusting for fat free body mass and smoking, Bigaard et al. (2004) found an average mortality rate of 1.12 for obese men and 1.06 for obese women. In addition, obesity is associated with an increased relative risk for multiple cancers (Adami & Trichopoulos, 2003), especially renal cancer (Chow, Gridley, Fraumeni, & Järvholm, 2000).

Although practical guidelines for health professionals recommend weight loss for overweight or obese individuals (North American Association for the Study of Obesity & National Heart Lung and Blood Institute, 2000), there is contradictory evidence from epidemiological studies regarding that recommendation. Several studies, including randomized controlled trials, support the hypothesis that moderate weight loss improves overall health (Stampfer, 2005; Yang, Fontaine, Wang, & Allison, 2003). For example, Franco et al. (2007) reported a decline of all cause mortality of 18% in Cuba from 1980 until 2005 due to economy-induced sustained weight loss in the population. On the other hand, there is empirical evidence supporting the hypothesis that intentional weight loss increases mortality rates in obese individuals (Sørensen, 2003). In a review by Poobalan et al. (2007), the authors concluded that intentional weight loss might have beneficial effects on all cause mortality for women, but for men long-term effects remain unclear. One suggested explanation for these contradicting findings is that the effects of intentional weight loss on mortality might be a balance between opposing effects: the loss of harmful abdominal and ectopic fat mass and the loss of beneficial peripheral subcutaneous fat mass and lean body mass (Berentzen & Sørensen, 2006). In summary, empirical data is not sufficient so far to differentiate between different ways of weight loss, following the hypothesis that there are healthy and unhealthy ways of reducing one's body weight.

1.1.3 Etiology

Obesity is a phenomenon with multiple etiological factors. Figure 1.1 gives an overview of the multifactorial genesis of obesity. A long-term positive energy balance is considered to be the primary etiological factor for obesity. The energy balance is mainly influenced by eating behavior and physical activity, but also by

metabolism rate. The basal metabolism rate is independent of the amount of physical activity and may only be influenced by the amount of muscle tissue. The level of energy uptake and energy consumption is influenced by behavioral, emotional, biological, and genetic factors (Herpertz & Senf, 2003). In the following chapters, different explanatory models of the etiology of obesity are presented.

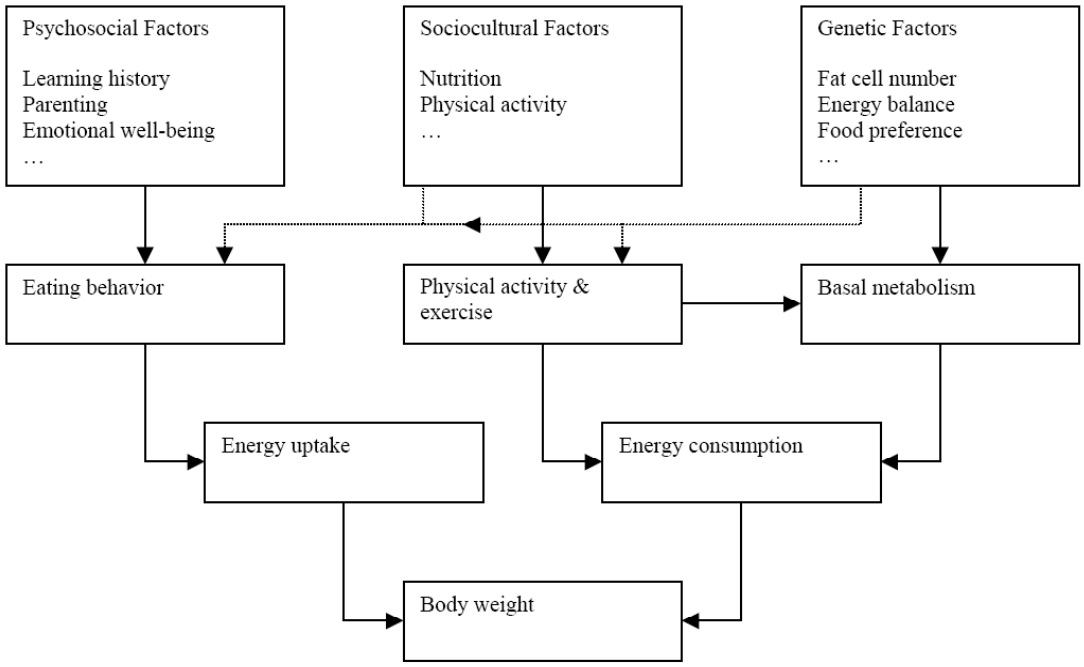

Figure 1.1. Biopsychosocial model of the development and maintenance of obesity (from "Adipositas [Obesity]," by S. Lehrke and R. G. Laessle, 2003, p. 511, in *Lehrbuch der Verhaltensmedizin [Textbook of Behavioral Medicine],* U. Ehlert [Ed.], Heidelberg, Germany: Springer. Copyright 2003 by Springer Verlag. Reprinted with permission of the author).

1.1.3.1 Evolutionary and Biological Factors

The thrifty gene hypothesis (Neel, 1999) postulates that certain genes in humans have evolved to maximize metabolic efficiency, lipid storage, and food preference. In the past, this genotype would have been advantageous for humans during periods of famine. However, with ubiquitous availability of high energy food (high fat, high carbohydrate) and low levels of physical activity in Western societies, this genotype is disadvantageous and too efficient, leading to a

constantly positive energy balance in humans and therefore to overweight or obesity.

Even though intuitively valid, Speakman (2007) challenged the thrifty gene hypothesis by pointing to the fact that most individuals in Western societies are not obese. Instead, he hypothesized that the absence of predation led to a change in the population distribution of body fatness due to random mutations and drift.

A more biological approach is the so called set-point theory (Nisbett, 1972) which argues that an individual's metabolism will adjust itself to maintain a weight at which certain factors influencal of body weight (diet composition, physical activity) are balanced out. According to this model, body weight remains stable as long as there are no major changes regarding the factors which influence body weight. A short-term alteration of, for example, diet composition would not cause an adjustment in the set point of body weight, but a long-term positive energy balance would shift the set point upwards resulting in a new stability of heightened body weight. On the other hand, it is proposed that a reduction in body weight is met by a down-regulation of the metabolism rate. The latter is often cited as an explanation for failed weight-loss attempts. Although plausible, the down-regulation of the metabolism rate as a cause for unsuccessful weight loss has not been supported empirically (Weinsier et al., 2000).

1.1.3.2 Genetic Factors

Genetic studies have shown that both childhood and adult obesity are substantially inheritable. In their review, Maes, Neale, and Eaves (1997) concluded that results from twin studies suggest that genetic factors explain 50% to 90% of the variance in BMI. Family and adoption studies confirmed these estimates with heritability equivalents of 20% to 80% and 20% to 60% of the variation in BMI, respectively. In the same review, weighted mean correlations were estimated as .74 for monozygotic twins, .32 for dizygotic twins, .25 for siblings, and .19 for parent-offspring pairs. Moreover, Hewitt (1997) showed that there are genetic influences responsible for the change in BMI from young adulthood to middle age that are independent of the genetic influences on individual differences in BMI at age 20. That means that the increase in body fat in adulthood is controlled independently of the leaner body mass measured in young adulthood. This composition of phenotype with changing genetic etiology

was confirmed by Faith et al. (1999) who identified independent genetic influences on fat mass and BMI in a sample of pediatric twins.

Apart from population- or twin-based studies, research of the last two decades focused on Mendelian causes or polymorphic markers for obesity (Barsh, Farooqi, & O'Rahilly, 2000). Known monogenic forms of functionally relevant mutations are rather rare (e.g., in the melanocortin-4 receptor gene), whereas polymorphisms are more frequent (Hebebrand, Friedel, Schäuble, Geller, & Hinney, 2003). Although several obesity loci and common obesity genes are identified (Frayling et al., 2007; Hinney et al., 2008; Larsen et al., 2005), the interacting pathways of several genes and loci are complex and not well understood, not mentioning the physiological mechanisms linked to the candidate genes.

1.1.3.3 Environmental Factors

Genetic studies, if longitudinal, can estimate the influence of shared (e.g., family) and nonshared environments on BMI. Hewitt (1997) concluded that there is little evidence from genetic studies for focusing on shared environments such as household characteristics (e.g., meal patterns), whereas individual, nonshared environments gain importance. In Western (or westernized) societies, the environment promotes an almost omnipresent access to leisure time activities such as television or computer, a nearly universal access to high-density, cheap food, and a trend towards the sitting professional (Hill & Peters, 1998). Highly palatable, inexpensive food is available nearly everywhere (White, 2007), and portion sizes grow bigger on a regular basis (Division of Nutrition and Physical Activity, 2006). For example, the standard package of Goldbären (gummy bears) contained 100 grams two decades ago whereas the current standard package contains 300 grams (HARIBO GmbH & Co. KG, 2007). Moreover, the amount of dietary fat in processed food (e.g., crisps, pizzas) is often hardly visible on packages, and even low-fat products, leading customers to belief that they buy a healthy product, often contain vast amounts of fat and sugar (Prentice & Jebb, 2003). In addition, physical activity levels decline in the population and the current environment discourages physical activity in Western societies: the dispersal of elevators, escalators, sophisticated transportation systems, and increased automobile use reduces the need to engage physically (Di Pietro, 1995).

1.1.3.4 Behavioral and Psychological Factors

Energy intake and energy expenditure are compounds of complex behaviors which have multiple internal and external determinants (Wardle, 2007). Eating, for example, might be determined by accessibility, food characteristics (smell, sight), mood, appetite, food preference, cognitive control, hunger, socioeconomic status, or sociocultural norms – to name only a few. With universal access to cheap high-energy food and growing portion sizes, individuals nowadays consume more calories than three decades ago (Division of Nutrition and Physical Activity, 2006). Rolls (2007) hypothesized that the cerebral food reward system, relative to satiety signals, is overstimulated by factors like food palatability and appearance, visual stimulation and advertising, or food variety. Many of these factors are not well understood regarding the purpose of obesity prevention, and the food industry is currently working on promoting more consumption rather than less (Wardle, 2007).

Regarding food intake and emotions, Schachter (1964) formulated an etiological approach for the development of obesity in the context of cognitive-physiological theory of emotions. Schachter postulated that the eating behavior of overweight individuals is relatively independent of internal physiological signals, but dependent on dysphoric mood states like stress, frustration, or anxiety (Allison & Heshka, 1993). There is strong empirical evidence for the validity of Schachter's model. In a longitudinal study over three decades, BMI was highest in stress-driven eaters and drinkers, especially women (Laitinen, Ek, & Sovio, 2002): those individuals were more likely to consume sausages, hamburgers, pizza, chocolate, and alcohol. Also, individuals successful in long-term weight reduction were characterized by good coping with stress and a flexible control of eating behavior (Kayman, Bruvold, & Stern, 1990; Westenhöfer, von Falck, Stellfeldt, & Fintelmann, 2004).

Another etiological approach, the concept of restrained eating, was introduced by Herman and Mack (1975). Restrained eating is defined as a permanent pattern of conscious restriction or cognitive control of food intake to control body weight or to promote weight loss. It is characterized by a rigid cognitive style and a behavioral inflexibility concerning diet composition and eating (e.g., "I will never eat chocolate again"). If there are transgressions against the rigid dietary control (e.g., eating a piece of chocolate), a collapse of the cognitive dietary rules is

hypothesized, possibly resulting in a small binge (e.g., eating the whole bar). Furthermore, the theory suggests that a constant alteration between periods of rigid control and unrestrained eating may promote obesity or eating disorders (e.g., binge eating disorder). In a 2-year follow-up study by De Lauzon-Guillain et al. (2006), cognitive restraint was positively associated with BMI in normal weight individuals at baseline, whereas no association was found for overweight individuals. Also, initial cognitive restraint was not predictive of a change in BMI and therefore did not promote weight gain. Conversely, several other studies found that the prevention of weight gain is more likely when individuals engage in flexible control of eating rather than in restrained eating (Van Strien, 1997; Westenhöfer, Stunkard, & Pudel, 1999; Westenhöfer et al., 2004).

Apart from eating behavior, the second significant behavioral parameter in obesity is physical activity. Current recommendations for the prevention of weight gain vary from 30 min of brisk walking per day (Morabia & Costanza, 2004) to 45 to 60 min of moderate intensity activity per day (Saris et al., 2003). Contrary to recommendations, leisure-time physical activity was below these levels in a substantial proportion of a student sample (Haase, Steptoe, Sallis, & Wardle, 2004). Studies differentiating between successful and unsuccessful individuals regarding long-term weight loss found that higher levels of physical activity are a significant predictor for maintenance of weight loss (Davison & Birch, 2004; Filozof & Gonzalez, 2000; Jakicic, 2002; Kayman et al., 1990). According to Haase et al. (2004), a sedentary lifestyle is positively associated with cultural factors and national economic development, which confirms the high incidence of obesity in Western societies.

In summary, the most prominent etiological factors are high heritability, an omnipresent access to cheap high-density foods, decreasing levels of exercise, and stress-related eating.

1.1.4 Psychosocial Problems

Psychosocial problems emerge mainly due to the discrepancy between the increasing average weight of the population (Mensink et al., 2005) and the widely distributed thin ideal in society (Monro & Huon, 2005). Obesity is an overtly visible stigma and obese individuals are often discriminated against, mostly in areas like employment, education, or health care (Puhl & Brownell, 2001). For

instance, 25% of a representative population-based sample in Germany expressed explicitly stigmatizing attitudes toward obesity (Hilbert, Rief, & Brähler, 2008). Moreover, even when an explicit antifat bias was absent, strong implicit antifat attitudes were found in obese as well as nonobese individuals (Teachman, Gapinski, Brownell, & Jeyaram, 2003). Attributional analyses confirmed that weight is mostly regarded as being under internal/behavioral control in obese (Brogan & Hevey, 2008) and nonobese samples (Paxton & Sculthorpe, 1999; Weiner, 1980). In a study by Weiner, Perry, and Magnusson (1988), overweight individuals received little sympathy regarding their weight and evoked little readiness to help. Furthermore, personal responsibility and blame were estimated to be high. Overweight individuals seem to have internalized this view and attribute unsuccessful weight loss attempts (Jeffery, French, & Schmid, 1990) or general negative feedback mostly internally (Crocker, Cornwell, & Major, 1993). This explanatory model, including lack of willpower or discipline, can lead to negative affectivity, feelings of guilt, and to a long-term deterioration in self-efficacy beliefs.

The majority of obese individuals also suffers from significantly greater body image dissatisfaction compared to normal weight controls (Sarwer, Wadden, & Foster, 1998). Body dissatisfaction has proven to be positively associated with dietary restraint (Jaeger et al., 2002), depressive symptoms and lower self-esteem (Foster, Wadden, & Vogt, 1997; Grilo, Wilfley, Brownell, & Rodin, 1994; Sarwer et al., 1998), and a self-criticizing, avoiding coping style (Myers & Rosen, 1999). Moreover, there is strong empirical evidence that body dissatisfaction is a causal factor in the development of binge eating behavior (Jaeger et al., 2002; Ricciardelli, Tate, & Williams, 1997; Wardle, Waller, & Rapoport, 2001). Binge eating occurs in a significant number of obese individuals (Spitzer et al., 1992) and increases in frequency with higher BMI (Telch & Agras, 1994). Blundell and Gillett (2001) stated about obese individuals that up to 47% of some samples displayed binge eating patterns and approximately 16% engaged in nocturnal eating. In addition, binge eating patterns were related positively to personality disorder symptomatology (Picot & Lilenfeld, 2003; Van Hanswijck de Jonge, Van Furth, Lacey, & Waller, 2003) and the degree of psychiatric symptomatology (Telch & Agras, 1994).

Regarding general psychopathology, obese individuals showed significantly higher prevalence rates of mental disorders compared to nonobese individuals (Becker, Margraf, Türke, Soeder, & Neumer, 2001; Herpertz et al., 2006). In particular, obese individuals suffered significantly more often from anxiety disorders than individuals who were not obese. Nevertheless, the developmental sequence of the comorbidity remains unclear. In a large sample of obese individuals ($N > 10{,}000$), obesity was associated with poor mood and symptoms of anxiety and depression (Karlsson, Taft, Sjöström, Torgerson, & Sullivan, 2003). This trend was not confirmed by studies investigating mental well-being: Although physical well-being deteriorated markedly with higher BMI (W. J. Brown, Mishra, Kenardy, & Dobson, 2000; Doll, Petersen, & Stewart-Brown, 2000), a deterioration in mental well-being was related to the presence of other chronic illnesses rather than high BMI (Doll et al., 2000).

1.1.5 Treatment of Obesity

1.1.5.1 Treatment Approaches

The basic components of obesity treatment consist of diet, exercise, and behavior therapy. This conglomeration of interventions is referred to as lifestyle modification (Fabricatore & Wadden, 2003). The aim of lifestyle modification is to implement behavioral changes into everyday life which can be maintained indefinitely rather than a limited period of time. Therefore, a change of diet must be differentiated from short-term dieting or fasting.

All dietary interventions have one feature in common: Initially, they aim to produce a negative energy balance. Thus, the amount of calories ingested should be smaller than the amount of calories expended. Current intervention programs distinguish between low-calorie diets (LCDs) and very-low calorie diets (VLCDs). LCDs are recommended for overweight and obese individuals and refer to a reduction of 500 to 1,000 kcal per day, whereas VLCDs refer to a daily energy intake of 200 to 800 kcal. Even though VLCDs cause greater initial weight loss, they were not found to be more effective than LCDs at 1-year follow-up (Wadden, Foster, & Letizia, 1994). Therefore, current recommendations discourage VLCDs. Another recommendation is that moderate weight loss should be attained slowly and progressively. If the negotiated body weight is achieved, the composition of diet should be modified. In the long run, a

nutritional balance has to be established with a certain amount of fats, proteins, carbohydrates, and low-calorie foods. Key elements such as food preparation, the avoidance of overconsumption of high-calorie foods, the reduction of portion sizes, and adequate water intake (rather than sweetened drinks or alcohol) are given special attention (North American Association for the Study of Obesity & National Heart Lung and Blood Institute, 2000).

Recently a dispute emerged around the question whether to reduce fat or carbohydrates in the dietary composite. Pirozzo and colleagues concluded in a review of six randomized controlled trials that there is no significant difference between low-fat diets and other weight-reducing diets in terms of weight loss maintenance (Pirozzo, Summerbell, Cameron, & Glasziou, 2003). A study comparing popular diets (Atkins, Zone, Weightwatchers, and Ornish) regarding adherence rates and effectiveness came to the same conclusion: Each diet reduced weight and several cardiac risk factors at 1-year follow-up, although overall adherence was low (Dansinger, Gleason, Griffith, Selker, & Schaefer, 2005). Also, Foster et al. (2003) found no significant differences in weight loss between a low-carbohydrate and conventional diet after one year, whereas Samaha et al. (2003) found a low-carbohydrate diet more beneficial than a low-fat diet for severely obese individuals, although follow-up period only covered 6 months. Thus, reducing fat or carbohydrates both result in weight loss.

Additionally, current guidelines recommend physical activity – 30 min of modest intensity preferably every day (North American Association for the Study of Obesity & National Heart Lung and Blood Institute, 2000). Even though physical activity alone does not cause weight loss, it is important for weight maintenance since the lean body mass and, therefore, metabolism rate increases. Also, physical activity is associated with health benefits (Erlichman, Kerbey, & James, 2002).

Behavior therapy is known as a helpful factor for the implementation of a healthy diet and increased physical activity in daily routines. It aims to modify dysfunctional beliefs and behaviors, to cope with weight-related psychological and social problems, and to help individuals adhere to diet and activity goals (Cooper & Fairburn, 2001; Fabricatore & Wadden, 2003; Latner, Wilson, Stunkard, & Jackson, 2002). Various nondietary intervention programs were designed with emphasis on cognitive-behavioral techniques to increase general

well-being rather than to promote weight loss (Bacon et al., 2002; Carrier, Steinhardt, & Bowman, 1993; Miller & Jacob, 2001; Robinson & Bacon, 1996). All these nondietary approaches, compared to dietary approaches, produced similar improvements in psychological well-being, eating behavior, and physical fitness, but not regarding weight loss.

Pharmacotherapy should be considered when lifestyle modification does not produce weight loss and when physical comorbidity is high. However, prescriptions should be given temporarily and only in conjunction with lifestyle modification, especially a calorie-reduced diet. Orlistat, a pancreatic lipase inhibitor, prevents the absorption of fats, thereby reducing calorie intake. In a systematic review of 23 randomized controlled trials, orlistat proved to be more effective than placebo in promoting modest weight loss, weight maintenance, and reducing weight-related risk factors, even after 2-year follow-up (O'Meara, Riemsma, Shirran, Mather, & ter Riet, 2004). Individuals treated with orlistat reported a 2.9% greater reduction in weight compared to placebo-treated individuals (Padwal, Li, & Lau, 2004). Another antiobesity agent is sibutramine, a noradrenaline and serotonin reuptake inhibitor. Sibutramine increases levels of the neurotransmitters dopamine, serotonin, and norpinephrine, thereby increasing the subjective perception of satiety. In a recent systematic review, sibutramine proved to be modestly successful in promoting weight loss after one year (Padwal et al., 2004), with individuals experiencing a 4.6% greater weight loss compared to the placebo group. Another review of 29 trials reported a surplus weight loss of 4.45 kg in sibutramine-treated individuals compared to placebo after one year (Arterburn, Crane, & Veenstra, 2004). In summary, both antiobesity agents are modestly effective in weight reduction and maintenance, with sibutramine showing more negative side effects than orlistat (Nisoli & Carruba, 2004).

For individuals with a BMI above 40, bariatric surgery might be indicated as a treatment option. The two most commonly procedures are vertical banded gastroplasty and gastric bypass (Buchwald, 2002). Bariatric surgery is highly successful in promoting weight reduction in morbid obese individuals. For instance, Barnett et al. (2005) reported a 45% reduction in BMI in 14 individuals with a mean follow-up period of 6 years. Bariatric surgery is not only successful but safe. In a systematic review and meta-analysis of 361 studies including 85,048 patients, the total mortality rate 2 years after intervention was smaller than

0.4% (Buchwald, Estok, Fahrbach, Banel, & Sledge, 2007). Therefore, bariatric surgery can be considered the only broadly successful therapy approach for morbid obesity.

1.1.5.2 *Effectiveness of Treatments*

A review and meta-analysis of 80 clinical trials (*N* = 26,455; 18,199 Completers [69%]) compared eight types of weight-loss interventions (Franz et al., 2007). Inclusion criterion was a follow-up period of at least 1 year, primary outcome measure was weight loss. After 48 months, a mean weight loss of 3% to 6% (3 to 6 kg) was maintained, with no study group regaining all weight which was formerly lost (see Figure 1.2). Interventions like exercise alone or advice only failed to produce substantial weight loss initially. Most successful long-term weight-loss interventions (> 4 years) were diet-orlistat and diet-exercise.

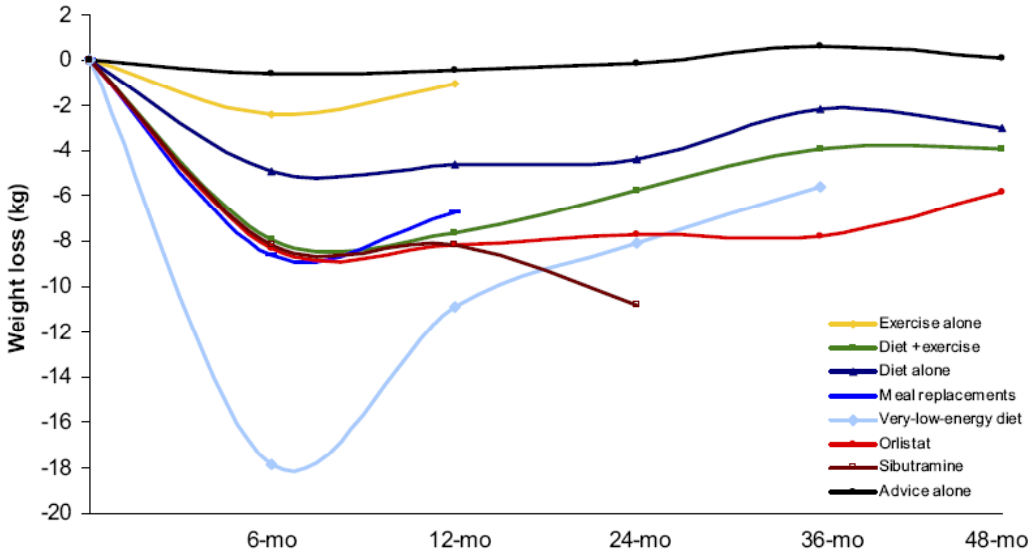

Figure 1.2. Average weight loss of individuals completing a minimum of 1-year weight-management intervention (from "Weight-loss outcomes: A systematic review and meta-analysis of weight-loss clinical trials with a minimum 1-year follow-up," by Franz et al., 2007, *Journal of the American Dietetic Association, 107*, p. 1757. Copyright by the American Dietetic Association. Reprinted with the permission of the author).

A similar conclusion was reached by a former review investigating which intervention should be best combined with weight reducing diets (Avenell et al., 2004): Long-term maintenance of weight loss was achieved through a combination of either orlistat-diet or exercise-diet-behavior therapy. At 36-month follow-up, maintained weight loss varied from 3 to 8 kg. In another review by Ayyad and Anderson (2000), weight loss and maintenance were analyzed in 17 studies reporting on 3,030 individuals. After a median follow-up of 4 years (3 to 15 years), 15% of the remaining 2,131 individuals reported a maintained weight loss of at least 9 kg. Diet combined with group therapy and active follow-up (booster sessions) were more successful than diet alone or diet with behavior modification. In an analyses of all US studies, mean weight loss maintained after 5-year follow-up was at least 3% of initial body weight (Anderson, Konz, Frederich, & Wood, 2001). Regarding success rates, a prospective study assessing long-term maintenance reported that 40% of individuals, after a 12-week weight loss program, successfully maintained a weight loss of at least 5% of initial body weight at 5-year follow-up, and 25% individuals at least 10% of initial body weight after seven years (Anderson, Vichitbandra, Qian, & Kryscio, 1999).

Several other studies assessed successful weight maintainers to explore intra-individual factors for successful weight loss and maintenance. Successful weight maintenance seems to be associated with low levels of stress (Klem, Wing, McGuire, Seagle, & Hill, 1998; Sarlio-Lähteenkorva, Rissanen, & Kaprio, 2000), low levels of depression and eating related psychopathology (Klem et al., 1998), high levels of physical activity (Klem, Wing, McGuire, Seagle, & Hill, 1997), and healthy eating (Sarlio-Lähteenkorva et al., 2000). Moreover, long-term weight loss was not associated with permanent distress, but with an overall improvement in mental (Klem et al., 1997; Kolotkin, Crosby, Williams, Hartley, & Nicol, 2001) and physical well-being (Klem et al., 1997).

In retrospect, the most effective interventions for weight reduction seem to be the combinations diet-exercise(-behavior therapy) and diet-orlistat with an average weight loss of 4 to 6 kg after 4 years. Supportive intra-individual factors are low levels of psychopathology and successful coping with stress.

1.2 Guilt and Shame

The emotions guilt and shame have been found to be prominent factors in the development and maintenance of numerous clinical disorders, e.g., depression (Alexander, Brewin, Vearnals, Wolff, & Leff, 1999), posttraumatic stress disorder (PTSD; Lee, Scragg, & Turner, 2001), or alcoholism (Potter-Efron, 2004). In eating disorders, weight-related shame and guilt are strongly related to the severity of the symptomatology (Burney & Irwin, 2000; Frank, 1991; Sanftner, Barlow, Marschall, & Tangney, 1995). Although obesity is not classified as a mental disorder, its negative effects on psychological well-being can be tremendous (Karlsson et al., 2003; Sarlio-Lähteenkorva, 2001) which may lead to increased rates of mental disorders in the obese population (Becker et al., 2001). In addition, the obese population is a heterogeneous group with regard to psychological well-being. Thus, despite higher rates of psychopathology, we still lack sound knowledge about the psychological mechanisms involved in the adjustment to obesity. Feelings of bodily shame and guilt about weight control attempts might mediate the link between obesity and psychopathology.

1.2.1 Conceptualization of Guilt and Shame

Guilt and shame are closely related through the common basis of a perceived failure in regard to a specific standard or rule. However, the current conceptualizations of these self-conscious emotions have distinct characteristics and consequences (Lewis, 1993). *Shame* refers to a failure or shortcoming attributed to the global self as the object of evaluation. It is described as a highly negative emotional state accompanied by feelings of being exposed, worthless, or weak and manifests itself in the tendency to hide, disappear, or withdraw. Concerning *guilt,* the focus of the evaluation is on a specific behavior that led to a failure or shortcoming rather than on the individual itself. Remorse about the shown behavior is likely (but not inevitable) to elicit some corrective action to make up for the failure or shortcoming. In other words, shame applies to how one feels about oneself as a person and guilt applies to how one behaves. There is empirical evidence for the theoretical differentiation between shame and guilt. For example, self-discrepancies, measured by differences in adjective ratings

about ideal, ought, and actual self, were found to be related to shame proneness rather than guilt proneness (Tangney, Niedenthal, Covert, & Barlow, 1998). Moreover, individuals in the study of Tangney, Miller, Flicker, and Barlow (1996) rated shame experiences to be more intense and aversive than guilt. Measures of general shame were found to be related consistently to indexes of psychopathology (Andrews, Qian, & Valentine, 2002; Gee & Troop, 2003; Sanftner et al., 1995), whereas the empirical findings concerning general guilt are not as clear. Tangney, Wagner, and Gramzow (1992) reported mostly nonsignificant correlations between psychopathological symptom reports and guilt residuals (the unique variance in guilt) of a scenario-based guilt measure, whereas Harder, Cutler, and Rockart (1992) stated that their adjective-checklist guilt measure was significantly associated with the Symptom Checklist-90-Revised (Derogatis, 1994) global severity index (r = .45). To explain the contrary results, Ferguson and Crowley (1997) confirmed by means of a multi-method approach two distinct kinds of guilt – ruminative and nonruminative. Ferguson and Crowley suggested that ruminative guilt may occur if the behavioral transgression is left unresolved. Individuals are then likely to experience ongoing distress in the form of self-accusation.

When regarding the situational determinants, there remains an ongoing debate about whether shame is the more public emotion than guilt. Smith, Webster, Parrot, and Eyre (2002) found that public exposure is linked more strongly to shame than to guilt, whereas Tangney et al. (1996) found that shame and guilt occurred equally often in interpersonal contexts. The two conflicting findings might be deemed compatible by differentiating the shame inherent “concern with others’ evaluation” and the guilt inherent “concern with effect on others”, both interpersonal and equally prevalent, but emotion-specific concerns (Tangney, 1992).

Despite distinctive features, it should be noted that both emotions are likely to co-occur, and overall reports of guilt and shame experiences in the same situations are rather high. For example, one can avoid exerting oneself physically in front of others because of bodily shame and feel guilty about not working out at the same time.

1.2.2 Guilt and Shame in Obesity

There are several reasons why feelings of bodily shame and guilt concerning weight control are common among obese individuals. First, obese individuals are still overtly or implicitly discriminated against (Puhl & Brownell, 2003). Western society is strongly influenced by a dietary spirit that implies that losing weight can be easily achieved, for example, in magazines or advertisements, which may increase the social pressure on obese individuals. More important, obese individuals who receive negative feedback from others tend to attribute the feedback to their weight rather than to illegitimate prejudices of others (Crocker et al., 1993). This in turn might lead to feelings of inadequacy and retreat (Myers & Rosen, 1999). For example, Drury and Louis (2002) found that overweight individuals delay or avoid health care utilization due to the fear of being stigmatized by health care professionals. Second, failures of weight control attempts are mostly attributed internally by obese individuals (e.g., lack of willpower) rather than externally (e.g., specific aspects about diet), providing additional reasons for feelings of guilt and shame (Goodrick, Raynaud, Pace, & Foreyt, 1992; Jeffery et al., 1990). Although a behavioral change after self-blame might be expected (e.g., change of eating habits), attributions of failure were found to have no prognostic significance concerning weight control attempts (Paxton & Sculthorpe, 1999) or adherence (Jeffery et al., 1990). Third, expectations of obese individuals concerning treatment outcome are rather high, with goal weights of 30% under their current weight (Foster, Wadden, Vogt, & Brewer, 1997). The latter reason is contrasted by longitudinal studies that have indicated poor weight loss maintenance after dietary treatments and a small chance of long-term reduction of 5% to 10% of initial weight (Anderson et al., 2001; Jeffery et al., 2000; Sarlio-Lähteenkorva et al., 2000). Furthermore, there is growing evidence that genetic factors play a crucial role in the predisposition and genesis of obesity fortifying the stable character of the phenomenon (see chapter 1.1.3.2; Hebebrand et al., 2003). Consequently, the discrepancy between weight loss expectations (e.g., 30% under initial weight) and long-term treatment outcomes heightens the likelihood of perceiving successful weight control attempts (5% to 10% under initial weight) as failures, which are mostly then attributed internally. Finally, feelings of ineffectiveness after perceived failure in weight control attempts might have a negative effect on future weight

maintenance and/or relapse (Byrne, 2002), which in turn may increase feelings of guilt or shame about the inability to control weight. For example, Burk-Braxton (1996) reported lowered weight-related self-efficacy scores in nonmaintainers compared to maintainers and controls. The same study found nonmaintainers to have the highest scores on measures of shame and guilt related to eating.

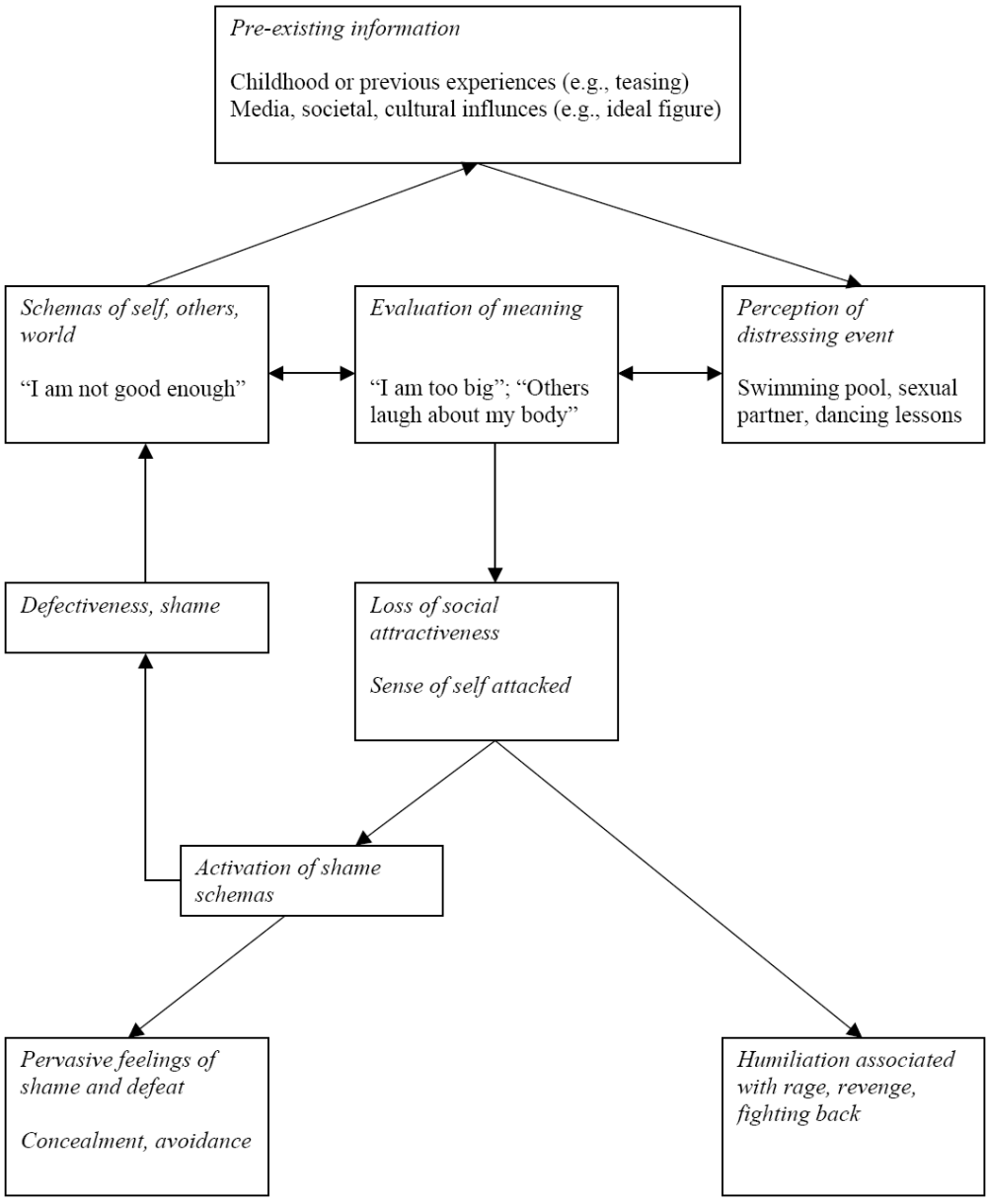

Figure 1.3. Shame-based reactions in obesity.

To illustrate the difference between shame- and guilt-based reactions in obesity, Figure 1.3 and 1.4 were adapted from a model proposed by Lee et al. (2001) for

shame- and guilt-based reactions in PTSD. Figure 1.3 shows a schematic formulation of shame-based reactions in obesity. Pre-existing information, like profound childhood experiences (e.g., teasing by peers or diet camps) or societal/cultural influences (e.g., ideal body shape conveyed by media or peers), shape core schemas about the self, others, and the world (Padesky, 1994). Such core schemas, specifically about the self, may be activated by a distressing event or situation (e.g., showing one's body at the swimming pool and others laughing). The evaluation of the meaning of the event may result in a subjective loss of social attractiveness (e.g., "I am too big"). That might either provoke a feeling of humiliation and associated reactions like fighting back (e.g., swearing at others) or an intense feeling of shame which (a) may trigger safety behavior like withdrawing or avoiding the situation and (b) may confirm the schema about the self (e.g., "I am not good enough"). The decision, which behavior is shown, is made on prior experiences, self-efficacy beliefs, and habit. It is important to note that shame-based reactions per se are not always maladaptive in obesity, but they can reach a maladaptive level, for instance, when the individual reacts to distressing events mostly with feelings of defeat, self-criticism, or concealment.

Analogously, guilt-based reactions are based on pre-existing information like familial attitudes (e.g., "If you want it, you can get it") or societal beliefs and convictions (e.g., "Losing weight is a matter of willpower"; Figure 1.4). After a transgression (e.g., violating the dietary rules and eating a cream pie), individuals evaluate the meaning by equating personal standards (e.g., "I mustn't eat cream pie"), personal responsibility, and related pre-outcome knowledge (e.g., "Food intake is always a matter of willpower"). If no reasonable justification can be found, individuals might experience feelings of guilt which either provoke a reparative action (e.g., extra hour of exercise) or, in the worst case, ruminative thoughts about the transgression. Again, feelings of guilt are not maladaptive per se since in most cases they result in some corrective behavior. But if an individual is constantly preoccupied with self-blame, feelings of guilt become maladaptive. Ruminative guilt might evoke feelings of shame since the inability to meet certain standards can be attributed to the worthlessness of the self.

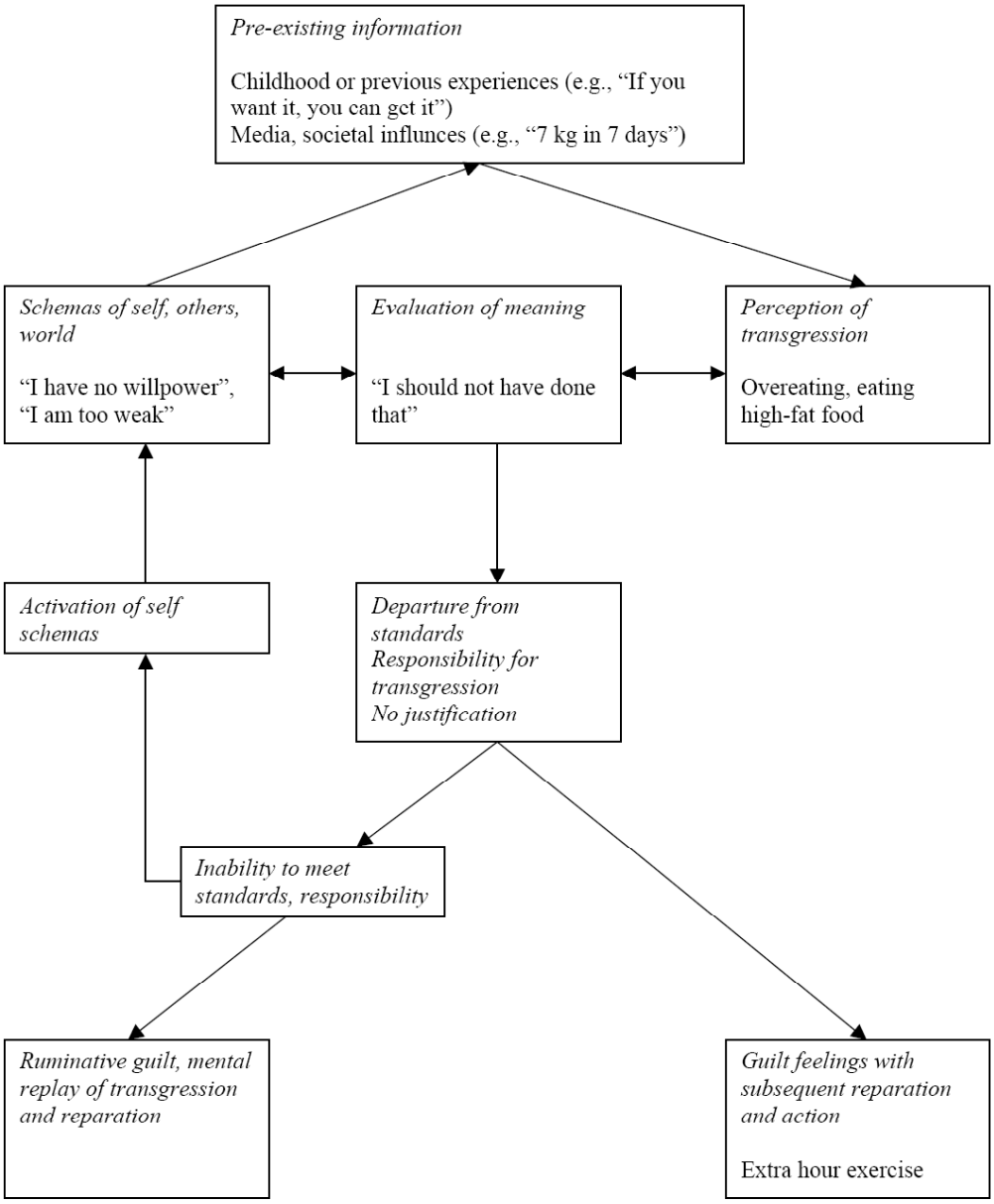

Figure 1.4. Guilt-based reactions in obesity.

1.3 Coping

Byrne (2002) identified three major psychological factors which are associated with weight maintenance and relapse in obesity: poor coping, low self-efficacy, and unrealistic weight loss goals. In the current conceptualization, coping is defined as the behavioral, emotional, or cognitive effort to solve personal or interpersonal problems and to reduce or tolerate stress. Since overweight or obesity can be a major source of distress in a subgroup of obese individuals

(Fitzgibbon, Stolley, & Kirschenbaum, 1993), the understanding of how obese individuals appraise and adjust to situational obstacles might be helpful to find mechanisms explaining the heterogeneity of the population regarding psychological well-being and weight management.

1.3.1 The Transactional Model

The transactional model of stress and coping offers a framework for evaluating the processes of coping with stressful events or situations related to chronic illnesses or states. According to Lazarus and Folkman (1984), stress is defined as a certain transaction between an individual and his or her environment. As perceiving a stressor as such, an individual appraises the internal or external demands (environment). If the subjective coping capacity is considered to be not sufficient to deal with the stressful event, an individual experiences stress. Whether a potentially stressful event provokes stressful experiences in an individual is (a) dependent on the cognitive and emotional appraisal of the event and (b) on the social and cultural resources at his or her disposal. If the stressor is evaluated as irrelevant or even positive regarding the individual's situation, no stress results.

The process of appraisal consists of three stages: primary appraisal, secondary appraisal, and cognitive reappraisal. (1) When confronted with a stressor, an individual evaluates the potential impact, differentiating between potential loss, threat, or challenge (primary appraisal). (2) If the stressor is evaluated as threatening, the individual assesses his or her coping resources and options for dealing with the stressor (secondary appraisal). (3) In a third step, the actual coping effort aims at regulation of the problem. The outcome of the process is reevaluated by means of the primary appraisal (cognitive reappraisal). It is important to note that the sequence of the three stages must not be considered as subsequent but varying in order; the process is automatic and appraisals or decisions for coping strategies might be applied at the same time and influence each other (Lazarus & Launier, 1978). The cognitive reappraisal might conclude that the coping effort was successful – the stressor is not perceived as stressful anymore. On the other hand, the result of the reappraisal might be that the coping effort was not effective, or even worse, that the stressor is perceived as more

stressful which can result in a loop of unsuccessful coping transactions and reappraisals.

1.3.2 Categorization of Coping Strategies

In their original work, Lazarus and Folkman (1984) differentiated between emotion- and problem-focused coping strategies. Both coping strategies include behavioral and cognitive strategies to adjust a situation (or adjust to a situation). Problem-focused coping consists of all behavioral efforts to change situational determinants as well as the influence or change of internal values, preferences, or goals. The latter strategies aim to increase well-being (or decrease stress) through modulating the cognitive appraisal of the stressful event. Emotion-focused coping describes all efforts to deal with stress-related emotions and feelings to decrease the emotional impact of the stressful event.

Similarly, Brandtstädter and Renner (1990) described two complementary modes of coping: The assimilative tendency is the individual's effort to transform environmental circumstances in accordance with personal preferences, whereas the accommodative tendency adjusts the individual's preferences to situational constraints. Hence, strategies like tolerating, enduring, avoiding, or even denying can be considered as coping strategies.

Another categorization divides coping into strategies that approach or avoid a stressor. By employing hierarchical factor analysis, Tobin, Holroyd, Reynolds, and Wigal (1989) showed that there are problem-focused and emotion-focused strategies that emphasize psychological disengagement (avoidance; e.g., problem-avoidance and self-criticism) and problem-focused and emotion-focused strategies which foster psychological engagement (approach; e.g., problem-solving and express emotions). Finally, two outcome-orientated categorizations have been suggested by Zeitlin (1980): adaptive and maladaptive. Surely, a coping strategy can only be labeled as adaptive or maladaptive by means of an outcome criterion (e.g., experienced stress level).

Even though the presented categorizations are still widely employed in research, a recent review of coping strategies dissuaded from their use (Skinner, Edge, Altman, & Sherwood, 2003). Instead, the authors recommend thirteen empirically derived higher order families of coping: problem solving, support seeking, escape, distraction, cognitive restructuring, rumination, helplessness,

social withdrawal, emotional regulation, information seeking, negotiation, opposition, and delegation. The review concludes that action-based types are the best higher-order categories (e.g., proximity seeking, accommodation) rather than single functions (problem- vs. emotion-focused) or topological distinctions (approach vs. avoidance). The main argument was that ways of coping are multidimensional (ratable e.g., on the dimensions approach-avoidance and cognitive-behavioral) and multifunctional: For example, a single strategy like seeking social support can be appraised regarding the dimensions approach-avoidance and cognitive-behavioral; also, it inherits emotion-focused as well as problem-focused coping. Nevertheless, a questionnaire covering these thirteen higher-order categories has to date not yet been developed. Therefore, the categorization of Tobin et al. (1989) is used in this study (see Appendix C.2).

1.3.3 Situational Determinants of the Stressful Event

Determinants which influence the choice of coping strategy might be located in the context of the situation (Lazarus & Folkman, 1984; Lazarus & Launier, 1978). The subjective appraisal of characteristics of the stressful event have great impact on the subsequent coping process. Therefore, not the stressful event itself determines the perceived coping capacity or strategy of the individual, but the subjective representation of the characteristics of the stressful event (Bijttebier, Vertommen, & Steene, 2001).

Perrez and Reicherts (1992) describe three important dimensions relevant for the choice of coping strategy: valence, which is defined as the experienced personal relevance or the impact of the event on one's life, controllability, which refers to the appraisal of the personal resources for changing the situation for the better, and changeability, which refers to the belief that the situation will change on its own without the individual's action. Other important factors are the familiarity (frequency of previous encounters with this type of situation), the predictability of the event or situation, and the duration of the event (stable vs. fluctuating).

It is hypothesized that the appropriateness of a certain coping strategy as a reaction to a stressful event is a function of these situational determinants. Thus, while an active coping strategy might be considered appropriate if the situation has been appraised as controllable, the same strategy would be considered

inappropriate if the situation has been appraised as uncontrollable. Indeed, individuals mostly experience chronic stress if the appropriateness of employed coping strategies is low.

1.3.4 Coping With Obesity

In the case of obesity, one might differentiate between coping efforts regarding weight-related situations (buying clothes, getting looks in the swimming pool etc.) and weight reduction efforts. Referring to the situational determinants of Perrez and Reicherts (1992), obesity features stability over time, low changeability, and limited controllability. Obesity is considered a chronic disorder (Bray, 2004). Most obese individuals who engage in weight loss programs only manage to maintain small weight losses, if any, over a longer period of time (> 5 years; Anderson et al., 2001), and long-term effective treatments and interventions are yet to be found. Therefore, weight loss is difficult and hard to accomplish.

Consequently, the availability and use of appropriate coping strategies for weight-related situations is likely to have a great impact on obese individuals' well-being (Kolotkin, Meter, & Williams, 2001). Obesity is associated with a variety of stressful events or situations (Kolotkin, Crosby, Williams et al., 2001; Myers & Rosen, 1999): stigmatisation, impairment of physical functioning, low self-esteem and reduced sexual life, to name only a few. Myers and Rosen (1999) found that the frequency of experienced stigmatization were positively associated with the frequency of coping attempts (r = .61) in a sample of obese individuals. Furthermore, disengaging coping strategies (negative self-talk, crying/isolating, avoiding/leaving situation) were significantly associated with measures of negative psychological adjustment, even after controlling for the variance of body weight. In a study by Rydén et al. (2001), the disengaging coping strategy "wishful thinking" was significantly associated with helplessness and intrusion (impact of obese state on one's life), whereas engaging strategies such as "social trust" and "fighting spirit" were negatively related to the two distress factors. Thus, disengaging coping strategies seem to be positively related to psychological distress.

Regarding coping and weight change, Kayman et al. (1990) compared coping responses to troubling issues, events, or situations, between weight relapsers,

weight maintainers, and individuals of the control group. Relapsers reported significantly more disengaging strategies (escape-avoidance) than maintainers and individuals of the control group. On the other hand, maintainers and control group individuals reported significantly more engaging coping strategies like problem solving/confronting and seeking social support. In another study, Drapkin, Wing, and Shiffman (1995) investigated the ability to generate coping responses to hypothetical high risk situations. Hypothetical situations were, for example, eating while watching TV or eating at family mealtime celebrations. The authors found that the ability to generate engaging coping responses at baseline was a predictor of weight loss after 12 months. Thus, specific coping responses seem to support long-term weight loss, whereas other coping strategies may be linked to emotional distress and relapse.

1.4 Feedback About Genetic Susceptibility for Obesity

With a rapidly growing body of research about the genetic etiology of obesity (see chapter 1.1.3.2), health professionals might be increasingly confronted with the task of informing patients about their genetic susceptibility (Lerman, Croyle, Tercyak, & Hamann, 2002). Whereas prenatal and carrier testing nowadays belong to standard procedures in genetic testing where individuals learn whether they have transmitted (or are in danger to transmit) an altered gene to their offspring, the detection of personal susceptibility to disease was introduced more recently in various medical fields, including obesity. Researchers hypothesized that the knowledge of genetic risk enhances medical decisions about future health behavior (Carpenter et al., 2007; Roussi & Miller, 2005). Regarding obesity, this might be, for instance, more flexible eating habits, less self-blame, or more realistic weight loss expectations due to a gene-action-based rather than a solely action-based explanatory model (Frosch, Mello, & Lerman, 2005; Harvey-Berino et al., 2001). Regardless of the potential behavioral and psychological benefits provided by risk assessment, there may also be adverse psychological and social risks of genetic risk testing, such as stigmatization, discrimination, and rejection of positive tested individuals (Phelan, 2002).

1.4.1 Genetic Counseling Versus Risk Feedback

Regarding secondary obesity, genetic counseling is clearly indicated when prenatal or carrier tests for monogenic forms of functionally relevant mutations are conducted (e.g., Prader-Willi syndrome, Bardet-Biedl syndrome, MOMO syndrome, leptin receptor mutations, melanocortin receptor mutations). In these rather rare cases, the causation of obesity is directly attributable to the genotype because a positive test is associated with a great chance of disease depending on inheritance pathway (autosomal dominant or autosomal recessive). Tested individuals have to be informed about inheritance and physiological pathways, physical and psychological consequences, and possible ways of coping (C. Evans, 2006).

Regarding primary obesity, indicators for genetic causes are less valid (Barsh et al., 2000). Therefore, genetic counseling in the full sense of the word is not indicated (C. Evans, 2006). The best currently known indicators for a genetic cause of primary obesity are either the existence of an obesity-relevant polymorphism (Hebebrand, Sommerlad, Geller, Görg, & Hinney, 2001), or a familial predisposition (at least one parent or sibling obese). Whereas a blood test necessary to identify a polymorphism is expensive and time consuming, the familial susceptibility can be easily determined by asking individuals to estimate the body size of their relatives (Bulik et al., 2001). Although a familial history of obesity can be used to estimate heritable risk, it should be noted that it is an imperfect marker, and many relatives of obese individuals neither carry the genetic predisposition nor develop overweight.

1.4.2 Hypothesized Consequences of Risk Feedback

Two models might offer a framework for understanding potential positive and negative effects of feedback about familial predisposition: In the first model, Baum, Friedman, and Zakowski (1997) proposed an adaptation from the transactional model of stress and coping (see chapter 1.3.1; Lazarus & Folkman, 1984). The model predicts long-term distress in individuals when feedback suggests a high risk, when uncertainty is not reduced, when results of risk analysis are at odds with preventive actions, or when individuals who receive a high-risk feedback lack social support, coping skills, and other resources. The

second model, the theory of planned behavior, describes the proximal influences on a individual's decision to engage in a behavior (see Figure 1.5; Ajzen, 1991).

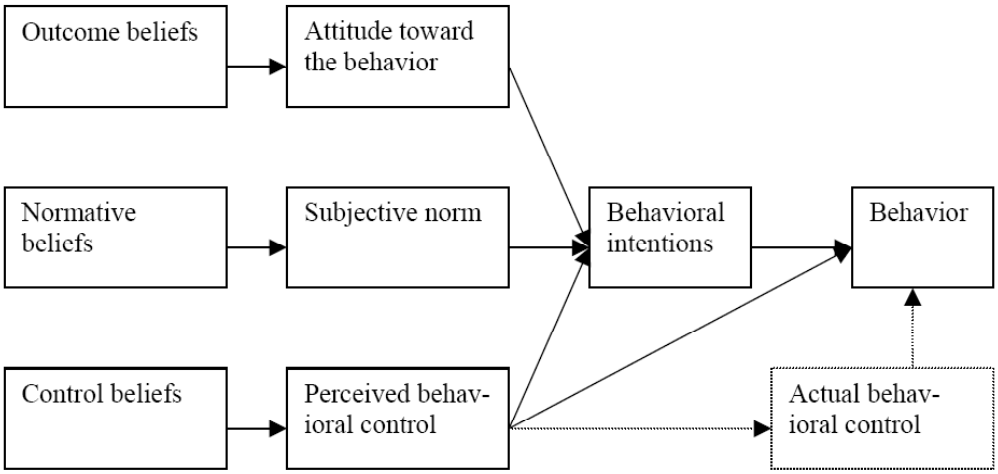

Figure 1.5. The theory of planned behavior (from "The theory of planned behavior," by Ajzen, 1991, *Organizational Behavior and Human Decision Processes, 50*, p. 179-211. Copyright by Icek Ajzen. Reprinted with the permission of the author).

Behavior is determined by intentions to engage in that behavior and by perceived behavioral control. Intentions, on the other hand, are determined by attitudes, subjective norms, and perceived behavioral control. The theory of planned behavior experienced empirical support regarding healthy eating (Conner, Norman, & Bell, 2002), reduction in fat intake (Paisley & Sparks, 1998), and weight loss (Schifter & Ajzen, 1985).

According to the above mentioned models, one might hypothesize that feedback about genetic susceptibility may alter the way obese individuals cope with their overweight and in which behavior they are likely to engage, respectively. First, an individual who is informed about his or her familial or genetic susceptibility for obesity might experience distress: Most obese individuals who seek treatment or take part in consultations plan to lose weight (Melchionda et al., 2003), and the word *genetic* is mostly interpreted as not controllable (Marteau & Croyle, 1998). Therefore, an obese individual might come to the conclusion that losing weight is going to be a difficult, if not

impossible task. Second, perceived behavioral control might decrease regarding behaviors which aim towards quick and substantial weight loss. Third, attitudes and subjective norms might change toward more modest weight loss goals and a more realistic likelihood of long-term weight loss. Consequently, the intention to engage in certain health behaviors might change: Short-term dieting might be replaced by a long-term modification of eating habits, and guilt-driven rigid control might be replaced by a more flexible, less self-blaming attitude towards fatty or high calorie food. Fourth, individuals might be stigmatized or labeled as genetically defected. The latter could result in feelings of insufficiency and shame. Finally, perceived behavioral control could decrease to zero if individuals attribute the genetic susceptibility as the one and only cause for their overweight, which, in turn, could result in a sense of fatalism and helplessness. For the latter reason, it is most important to provide alternative health behaviors and possibilities to engage when giving feedback about familial susceptibility.

In summary, the main goal of using genetic information in counseling of obese individuals is to provoke and foster healthier ways of coping with obesity, such as regular eating patterns, a flexible control of energy intake, slow weight loss with realistic weight loss expectations, and regular exercise. On the other hand, one aims to reduce guilt and self-blame, unrealistic weight loss expectations, self-punishment in form of a rigid dietary regime, low self-esteem due to unsuccessful weight loss trials, and short-term energy intake restrictions.

1.4.3 Empirical Evidence of Risk Feedback

Existing empirical evidence as to the effects of consultations using genetic information on an individual's psychological status is contradictory. As proposed by Baum et al. (1997), certain studies suggest that the feedback of increased risk to disease has adverse psychological effects. In a vignette study by Frosch et al. (2005), normal or overweight undergraduates ($18.5 < BMI < 29.9$) were asked to imagine that they had been tested for their risk of becoming obese. Experimental variations utilized were increased vs. average risk, and hormone vs. genetic testing. Results indicated that the effects of receiving feedback of an increased risk of becoming obese resulted in stronger intentions to follow a healthy diet. Interestingly, within the genetic test group, those who were told they were at an increased risk of becoming obese indicated lower perceived behavioral control

compared to those who were told they were at average risk. The authors concluded that their results reflected a sense of fatalism stemming from the belief that genetics are immutable. This view was supported by Lerman et al. (1997) who randomly allocated smokers to be tested for genetic susceptibility to lung cancer. The tested individuals were not more likely to quit smoking than individuals who were not tested. However, the tested individuals perceived their future risk of lung cancer as greater and were more fearful than those who were not tested. Assessing the adjustment to genetic testing for Huntington disease, Codori, Slavney, Young, Miglioretti, and Brandt (1997) also confirmed this finding. They found that after a 6-month follow-up genetically positive individuals indicated feeling significantly more hopeless concerning their future than genetically negative persons. Therefore, there is some evidence to suggest that high-risk feedback rather than average-risk feedback might have the potential for adverse psychological effects and result in worry or distress.

In contrast, there are two studies pointing to the hypothesis that genetic status information has at least no negative effects on individuals. One study compared obese individuals who tested positive for a β3-adrenergic receptor (β3AR) gene with a group of obese individuals who tested β3AR-negative (Harvey-Berino et al., 2001). The β3AR gene was found to influence weight gain and energy expenditure. After receiving feedback as to their genetic status, individuals who tested β3AR-positiv were not adversely affected concerning their subjective ability to lose weight or control their eating behavior. Paradoxically, these individuals were more likely to disagree with the impact of genetics on future weight loss efforts than the β3AR-negative individuals. The findings of Harvey-Berino et al. (2001) were confirmed by a study investigating hypercholesterolemia (FH). Receiving feedback of a genetic mutation that confirmed their diagnosis of FH did not reduce an individual's perception of control over the condition, or their adherence to risk-reducing behaviors (Marteau et al., 2004).

Even though Harvey-Berino et al. (2001) found no adverse effects concerning their obese participants' subjective ability to lose weight or control their eating behavior after feedback of their genetic status, one has to take the following methodological issues into account: The sample size and, therefore, the statistical power was small ($N = 30$); participants were informed before beginning a weight

loss program; and feedback about the genetic mutation was quite subtle ("…which may play a role in excessive fat accumulation", p. 1351). In the study of Marteau et al. (2004), participants were previously aware of the FH-diagnosis and it is likely that they consolidated appropriate risk-reducing behaviors before receiving feedback about the genetic predisposition. Hence, the current body of research about risk feedback suggests the use of a medium-risk feedback to alter health behaviors without risking adverse psychological effects (Frosch et al., 2005). Condit and Parrott (2004) proved that lay participants estimated the level of risk associated with the terminology "has a family history of" as significantly lower as compared to the higher level of risk attributed when the terminology "has a gene that causes" is used. The feedback about a familial predisposition, rather than a monogenic form of a functionally relevant mutation, is hypothesized to have positive effects on obese individuals without adverse psychological effects.

2 Objectives and Hypotheses

This chapter is a short overview of the aims, hypotheses, and employed methods of the three research manuscripts. All analyses of the manuscripts are based on the data of a nonclinical sample of obese individuals recruited for a genetic study run by the Medical and Psychological Department of the University of Marburg. The overall design of the study was longitudinal and aimed to evaluate a counseling approach using genetic information about obesity, suggesting divergent effects on individuals with a familial predisposition (at least one obese parent or sibling) and without a familial predisposition. Timing of assessment, information and consent forms, employed questionnaires and interviews are presented in Appendix A.1 to A.6. The two counseling approaches, with and without genetic information, are shown in Appendix A.7 and A.8. The figure in Appendix B.1 gives an overview of the sampling procedure.

The initial assessment comprised a short questionnaire (Appendix A.3; medical and sociodemographic information, body silhouettes), the measurement of height and weight, and a blood test. After randomized allocation to control and two intervention groups, all participants were assessed through an obesity-specific interview (Appendix A.5) and a selection of questionnaires (Appendix A.4) at baseline (time 1). After 6 months (time 2), participants were reassessed via telephone interviews (Appendix A.6) and mailed surveys. The control group did not receive consultation. Thus, the study comprised a 3 x 2 x 2 design (Group x Familial Predisposition x Assessment Time).

Sociodemographic, weight-related, and medical variables as well as Diagnostic and Statistical Manual of Mental Disorders III-Revised (DSM-III-R) diagnoses of the study sample ($N = 351$) are presented in Appendix B.2 to B.5.

2.1 Objectives and Hypotheses of Manuscript I

The goal of manuscript I was to present and validate a new scale called the Weight- and Body-Related Shame and Guilt Scale (WEB-SG). The relevance of measuring weight- and body-related shame and feelings of guilt for the understanding of obesity is diverse: First, weight-related feelings of shame and

guilt might be explanatory psychological factors for the phenomenon that only a subgroup of the obese population suffers from being overweight. Higher degrees of shame and/or guilt might be associated with higher levels of psychopathology, particularly body dissatisfaction, eating disturbance, and depressive symptoms as found in nonobese samples (Burney & Irwin, 2000; Frank, 1991; Jaeger et al., 2002; Sanftner et al., 1995). On the contrary, levels of body dissatisfaction proved to be independent from BMI in both obese and nonobese samples (Sarwer et al., 1998). Second, weight-related shame and guilt feelings might have differing behavioral correlates which was already confirmed by studies about general guilt and shame (e.g., Tangney, 1996). Consequently, weight-related shame and guilt might have differing prognostic relevance to the outcome of future weight loss trials (Burk-Braxton, 1996; Byrne, 2002), most likely through behavioral correlates. For instance, obese individuals might stop exercising in public due to body shame.

The following hypotheses were formulated: (Ia) Weight- and body-related shame and guilt, as measured by the new scale, are related but distinct constructs. (Ib) The constructs shame and guilt, as measured by the new scale, are rather stable over time. (Ic) Weight-related shame and guilt, as measured by the new scale, are weakly associated to BMI. (Id) Weight- and body-related shame and guilt, as measured by the new scale, show different correlational patterns to other constructs, with body shame being strongly correlated with indices of psychopathology (depressive symptoms, low self-esteem), whereas weight-related guilt is related to dietary restraint.

For the validation of the new measure, data of the assessment at baseline (time 1) were analyzed (n = 331). Measured constructs included weight- and body-related shame and guilt, distress about weight-related shame and guilt, shame and guilt about eating, body self-acceptance, depressive symptoms, self-esteem, dietary restraint, and rumination about being overweight.

2.2 Objectives and Hypotheses of Manuscript II

The aim of manuscript II was to determine the longitudinal associations among weight- and body-related shame and guilt, weight-related coping responses, and weight change over 6 months. The way of coping with weight-related issues might have a significant impact on obese individuals' well-being. Disengaging coping strategies seem to be positively related to psychological distress in obese individuals (Myers & Rosen, 1999; Rydén et al., 2001). Furthermore, specific coping responses seem to support long-term weight loss, whereas other coping strategies may be linked to emotional distress and relapse (Drapkin et al., 1995; Kayman et al., 1990). It was hypothesized that weight-related shame and guilt are mediating factors between distressing weight-related situations and the employment of coping strategies (Friedman et al., 2005). The basic idea is that the level of shame and guilt predicts the way of coping with weight-related situations. Research questions which arise are: What are typical distressing situations? Does the level of shame and guilt feelings predict future coping responses? Is the way of coping associated to future weight change?

Hypotheses of the second manuscript are therefore: (IIa) Distressing situations are mostly of evaluative nature (negative evaluation by others or self) and (IIb) the distress about those situations is not associated to BMI but measures of weight-related shame and guilt. (IIc) Weight-related shame feelings predict disengaging coping strategies, whereas weight-related guilt feelings predict engaging coping responses. (IId) Engaging coping strategies are positively related to weight loss, whereas disengaging coping responses are positively related to weight gain (or at least no weight loss).

Longitudinal data of the control group were analyzed (n = 98). Measured constructs included weight-related guilt and shame, weight-related coping, relative weight change, dietary restraint, and depressive symptomatology.

2.3 Objectives and Hypotheses of Manuscript III

The aim of manuscript III was to test the effects of informing obese individuals about a gene-based explanation of obesity on the level of weight-related shame and guilt feelings and weight-related attitudes. The main hypothesis was that a

consultation focusing on genetic information influences the controllability dimension of weight regulation beliefs and, therefore, decreases self-blame about eating and leads to more realistic weight loss expectations.

A consultation focusing on genetic factors might transmit the message that the heritability of body weight is high, and that losing weight long-term is even more difficult if an individual shows a familial predisposition to obesity. It was hypothesized that (IIIa) an obese individual informed about having a familial predisposition shows positive reactions that include a decrease in self-blame about eating and an adjustment to more realistic expectations concerning future weight loss attempts (control attribution to genes). (IIIb) Negative reactions might include feelings of hopelessness, more disengaging coping strategies as well as a decrease in engaging coping behaviors to deal with typical weight-related situations. (IIIc) Further, the labeling as "genetically burdened" might also stigmatize the individual which might show in an increase in body shame.

For that purpose, longitudinal data (6-month follow-up) of the two intervention groups (n = 253) and the control group (n = 98) were analyzed. Measured constructs were attitudes about weight loss (likelihood and satisfaction), self-blame about eating, weight-related coping responses, and body shame.

3 Manuscript I: Development of the Weight- and Body-Related Shame and Guilt Scale (WEB-SG) in a Nonclinical Sample of Obese Individuals

3.1 Introduction

The main goal of this study was to present a new measure of Weight- and Body-Related Shame and Guilt (WEB-SG) in obesity. Although obesity is not classified as a mental disorder, its negative effects on psychological well-being can be tremendous (Karlsson et al., 2003; Sarlio-Lähteenkorva, 2001). This may lead to increased rates of mental disorders in the obese population (Becker et al., 2001). In addition, the obese population is a heterogeneous group with regard to psychological well-being. Thus, despite higher rates of psychopathology, we still lack sound knowledge about the psychological mechanisms involved in dealing with obesity. Feelings of bodily shame and guilt about weight control attempts might mediate the link between obesity and psychopathology. The WEB-SG was developed in response to a perceived need for a short, easy-to-administer, self-report measure assessing the frequency of shame and guilt feelings related to obesity separately. A prevalence rate of approximately 20% in industrial countries (Lobstein & Frelut, 2003; Wyatt, 2003), a rising incidence (Flegal, Carroll, Kuczmarski, & Johnson, 1998), and the rather chronic character of obesity (Bray, 2004) underline the need to establish valid measures targeting factors crucial for psychological well-being in obesity.

3.1.1 Why are Feelings of Guilt and Shame Common in the Obese Population?

There are several reasons why feelings of bodily shame and guilt concerning weight control are common among obese individuals. First, obese individuals are still overtly or implicitly discriminated against (Puhl & Brownell, 2003). Western society is strongly influenced by a dietary spirit which implies that losing weight can be easily achieved, for example, in magazines or advertisements, which may increase the social pressure on obese individuals.

More important, obese individuals who receive negative feedback from others tend to attribute the feedback to their weight rather than to illegitimate prejudices of others (Crocker et al., 1993). This in turn might lead to feelings of inadequacy and retreat (Myers & Rosen, 1999). Second, failures of weight control attempts are mostly attributed internally by obese individuals (e.g., lack of willpower) rather than externally (e.g., specific aspects about diet), providing additional reasons for feelings of guilt and shame (Goodrick et al., 1992; Jeffery et al., 1990). Third, expectations of obese individuals concerning treatment outcomes are rather high, with goal weights of 30% under their current weight (Foster, Wadden, Vogt et al., 1997). The latter reason is contrasted by longitudinal studies indicating poor weight loss maintenance after dietary treatments and a small chance of long-term reduction of 5% to 10% of the initial weight (Anderson et al., 2001; Jeffery et al., 2000; Sarlio-Lähteenkorva et al., 2000). Consequently, the discrepancy between weight loss expectations (e.g., 30% under initial weight) and long-term treatment outcomes heightens the likelihood of perceiving successful weight control attempts (5% to 10% under initial weight) as failures, which are mostly then attributed internally. Finally, feelings of ineffectiveness after perceived failure in weight control attempts might have a negative effect on future weight maintenance and/or relapse (Byrne, 2002), which in turn may increase feelings of guilt or shame about the inability to control weight.

3.1.2 Why Measure Guilt and Shame in Obesity?

Shame and guilt might have a prognostic relevance to the outcome of future weight loss trials. Burk-Braxton (1996) reported lowered weight-related self-efficacy scores in overweight nonmaintainers compared to overweight maintainers and controls. In the same study, nonmaintainers were found to have the highest scores on measures of shame and guilt related to eating. Furthermore, shame and guilt might increase the risk of developing a clinically relevant Axis I disorder. For example, it is well known in eating disorder research that weight-related shame and guilt are strongly related to the severity of the symptomatology (Burney & Irwin, 2000; Frank, 1991; Sanftner et al., 1995).

3.1.3 Why a New Measure?

To our knowledge, there are three published scales tapping the constructs of weight-related shame and/or guilt. The shortest of these is a four-item scale called the Shame and Guilt Eating Scale (SG) by Frank (1990). Two items ask individuals to rate the level of guilt experienced when eating normally and overeating; the other two items assess individuals' experience of shame feelings. Even though SG is a short and valid instrument, it assesses guilt and shame feelings only as they relate to eating and overeating, respectively, therefore neglecting, for example, bodily shame or guilt regarding not exercising. For this reason, the scale was insufficient for our purpose. Another scale is the Body Image Guilt and Shame Scale (BIGSS; Thompson, Dinnel, & Dill, 2003). This is a scale assessing proneness to shame and guilt in weight- and body-related scenarios that requires the respondent to make four ratings in response to each of 15 scenarios, thus altogether requiring 60 ratings. Despite good psychometric properties, BIGSS has certain shortcomings in relation to our purpose. First, the task of 60 ratings is neither an easy nor a quickly accomplished one. Second, BIGSS measures the proneness of experiencing feelings of guilt and shame rather than the perceived frequency of their actual occurrence. Because we aimed to assess frequency of occurrence, we needed a scale with more general items rather than specific scenarios to make sure that obese individuals potentially experience the item content in real life. For example, if the rating for the shame item in the second scenario of BIGSS (scenario: "Your partner expresses disappointment over your body"; shame item: "You would feel diminished in your image of yourself") would be answered with "never," then the frequency rating could be interpreted in two ways: first, the absence of shame feelings in this scenario, or second, the absence of a partner. The third measure is the Objectified Body Consciousness Scale developed by McKinley and Hyde (1996). It comprises three subscales, each consisting of eight items measuring surveillance, body shame, and appearance control. Since our aim was to assess guilt and shame aspects separately, the scale did not meet our criteria.

3.1.4 Theoretical Considerations

Guilt and shame are closely related through the common basis of a perceived failure in regard to a specific standard or rule. However, the current conceptualizations of these self-conscious emotions have distinct characteristics and consequences (Lewis, 1993). *Shame* refers to a failure or shortcoming attributed to the global self as the object of evaluation. It is described as a highly negative emotional state accompanied by feelings of being exposed, worthless, or weak and manifests itself in the tendency to hide, disappear, or withdraw. Concerning *guilt*, the focus of the evaluation is on a specific behavior which led to a failure or shortcoming rather than on the individual itself. Remorse about the shown behavior is likely (but not inevitable) to elicit some corrective action to make up for the failure or shortcoming. In other words, shame applies to how one feels about oneself as a person and guilt applies to how one behaves. There is empirical evidence for the theoretical differentiation between shame and guilt. For example, self-discrepancies, measured by differences in adjective ratings about ideal, ought, and actual self, were found to be related to shame-proneness rather than guilt-proneness (Tangney et al., 1998). Moreover, individuals in the study of Tangney et al. (1996) rated shame experiences to be more intense and aversive than guilt. Measures of general shame were found to be related consistently to indixes of psychopathology (Andrews et al., 2002; Gee & Troop, 2003; Sanftner et al., 1995), whereas the empirical findings concerning general guilt are not as clear. Tangney et al. (1992) reported mostly nonsignificant correlations between psychopathological symptom reports and guilt residuals (the unique variance in guilt) of a scenario-based guilt measure, whereas Harder et al. (1992) stated that their adjective-checklist guilt measure was significantly associated with the Symptom Checklist-90-Revised (Derogatis, 1994) global severity index (r = .45). To explain the contrary results, Ferguson and Crowley (1997) confirmed by means of a multimethod approach two distinct kinds of guilt – ruminative and nonruminative. Ferguson and Crowley suggested that ruminative guilt may occur if the behavioral transgression is left unresolved. Individuals are then likely to experience ongoing distress in the form of self-accusation.

Despite distinctive features, it should be noted that both emotions are likely to co-occur, and overall reports of guilt and shame experiences in the same situations are rather high. For example, one can avoid exerting oneself physically in front of others because of bodily shame and feel guilty about not working out at the same time.

Our main purpose of this study was to assess shame and guilt feelings separately in obese individuals and to investigate differing behavioral and emotional correlates of these emotions. Based on the preceding considerations, we defined the two constructs underlying the scale as the following: (a) shame concerning the body, figure, or weight in front of others or imagined others and (b) guilt concerning eating habits, exercising, and weight control. We chose a frequency rather than an intensity rating, as there is strong evidence that the frequency of affect has a stronger impact on a participant's well-being than intensity (Diener, Sandvik, & Pavot, 1991). To avoid the influence of fluctuant behavioral changes (short-term diets or exercise) on the measurement of the frequency of guilt rather than shame feelings, we opted for a 6-month period in the scale instructions.

In addition to the WEB-SG, we chose several collateral measures. To test convergent validity, we included two short scales measuring guilt and shame feelings (SG, SG-Distress). To examine discriminant validity of the WEB-SG subscales, we included measures for depressive symptoms, self-esteem, body self-acceptance, and dietary restraint. Depressive symptoms, lowered self-esteem, and lowered body self-acceptance might be linked to shame because the current definition of shame includes the tendency to hide or disappear or feeling worthless. Restraint eating might be described as a consequence of guilt because it reflects a corrective action concerning weight. We included a measure of ruminative thoughts about being overweight to indicate the degree to which the Guilt subscale of the WEB-SG refers to ruminative or nonruminative guilt. *Ruminative guilt* reflects perseveration about repeated but not successful attempts at reparation, repetitive thoughts about transgressions, and feelings that no atonement for the misdeed would ever be sufficient. *Nonruminative guilt* refers to reparation or atonement, which implies a possible behavioral correction of the transgression (e.g., dieting).

3.2 Method

3.2.1 Item Generation and Reduction

Four experienced clinical professionals (including the author and the first three co-authors) created altogether 20 items possible for inclusion in the WEB-SG, 10 items referring to each − guilt or shame. We distributed this initial item pool to 15 experienced psychologists with the instruction to rate each item on a 5-point scale ranging from 1 (*not at all*) to 5 (*completely*) concerning its appropriateness to measure the assumed construct. That is, shame items were rated concerning their appropriateness to measure the shame construct, guilt items concerning their appropriateness to measure the guilt construct. Item selection was based on the criteria of a mean expert rating above 4. Finally, a scale of 12 items was determined with 6 items assessing body shame and another 6 items assessing guilt concerning weight control. Both subscales were intended to be equal in length. In the instructions, we asked participants to rate how often they experienced feelings of guilt and/or shame in the last 6 months on a 5-point scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, 4 = *always*).

3.2.2 Procedure

Since the World Health Organization (WHO) has defined obesity as a body mass index (BMI) ≥ 30 kg/m^2 (WHO, 2000), we recruited individuals with a minimum BMI of 30 through press releases, posters, and collaboration with general practitioners to take part in a study evaluating a new counseling approach regarding genetic factors in obesity. Written informed consent was obtained from each individual. Height and weight were assessed by medical staff either in general practice or at our laboratory. All participants provided demographic information and received €10 incentive for their initial participation. We randomly contacted half of the individuals to participate in further studies (study sample). Exclusion criteria consisted of the inability to speak and read German; age of under 18 or above 70 years; and evidence of major sensory, cognitive, or communication deficits. The baseline survey comprised of a questionnaire package, a psychiatric diagnostic interview, and an interview tapping relevant information about obesity. For a subsample of

participants (n = 112), we administered the same measures again after a 6-month period without any intervention during that time. The latter sample was used to determine retest reliability.

3.2.3 Participants

Of the randomly contacted individuals, a total of 331 agreed to participate in further studies which yields a dropout rate of 18.7%. Two thirds of the participants were female (68.9%). The mean age of participants was 45.50 years (SD = 13.28; range = 18–70). The mean BMI was 36 (SD = 5.18; range = 30–63). Table 3.1 provides an overview of demographic data of all respondents who took part in the study. Educational level has been conceptualized according to the standards of the Health Report for Germany (Statistisches Bundesamt, 1998), which combine school education indicators and occupational training indicators. In this report, school qualification was divided, along the lines of the German school system, into three categories (*low* = 9 years of schooling; *medium* = 10 years of schooling; *high* = 13 years of schooling). When compared to the distribution of the German population (Statistisches Bundesamt, 2005), the distribution of the level of education for our sample did not suggest any selection bias. Follow-up data for the retest-reliability estimation (no intervention sample) was available from 98 participants (attrition rate = 12.5%).

3.2.4 Measures

In addition to the WEB-SG scale, we administered the following measures:

Distress about shame and guilt feelings (Distress-SG). As part of a short structured interview, we assessed Distress-SG by three items asking participants whether they experienced feelings of guilt or shame concerning eating, their body/figure, or exercise/physical strain (e.g., “Do you know feelings of guilt or shame concerning eating?”). If answering *Yes*, we asked participants to rate on a 4-point scale ranging from 1 (*never*) to 4 (*always*) how often these feelings were very distressing for them. We calculated a total score for each participant by summing up the distress ratings of positively answered questions.

Shame and guilt concerning eating. As described previously, the SG by Frank (1990) comprises four items which assess guilt and shame concerning normal eating and overeating (e.g., "When I overeat, I feel that I am doing something wrong"; scale ranging from 1, *never*, to 5, *always*). Even though the guilt and shame subscales were moderately to strongly correlated in our sample (Spearman-Rho, $r = .56$, $p < .001$), we used subscale scores as well as sum scores of the SG.

Body self-acceptance. We administered the subscale Body Self-acceptance. This forms part of the Frankfurt Body Image Scale (Deusinger, 1998) and measures attitudes towards aesthetical aspects of the body. The subscale comprises six items (e.g., "I am pleased with my appearance") that were administered with a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). It discriminated well between obese and normal individuals (Deusinger, 1998).

Depressive symptoms. The Center for Epidemiological Studies Depression Scale − Short Form (CES-D-S) is a widely used, well-validated measure of depression appropriate for both clinical and nonclinical populations (Radloff, 1977). The scale consists of 15 items, each rated on a 4-point scale ranging from 0 (*rarely*) to 3 (*most of the time*). Hautzinger and Bailer (1993) reported good reliability and validity for the German version. Concerning the detection of individuals with clinically relevant depression scores, the CES-D-S showed high correspondence (97%) compared to the CES-D long form.

Self-esteem. We measured self-esteem using the German adaptation of the Rosenberg Self Esteem Scale (Ferring & Filipp, 1996). The German scale was tested by Ferring and Filipp (1996) in three different samples that yielded satisfactory reliability and validity indices. Stability was high, which underscores the trait character of the construct in measure. In this study, we administered the 10 items with a 4-point scale ranging from 0 (*strongly disagree*) to 3 (*strongly agree*).

Dietary restraint. To measure the degree of our participants' dietary restraint, we used the Restraint scale of the Dutch Eating Behavior Questionnaire (DEBQ-R) (Van Strien, Frijters, Bergers, & Defares, 1986). The scale comprises 10 items describing intentions to restrict food intake for weight reasons. Its psychometric properties are discussed elsewhere (Van

Strien et al., 1986). In a study conducted by Laessle, Tuschl, Kotthaus, and Pirke (1989), the scale proved to measure the actual restriction of food intake rather than the drive to be thin. In this study, items operated with a 5-point scale ranging from 1 (*never*) through 3 (*sometimes*) to 5 (*always*).

Rumination about being overweight. To identify whether our guilt subscale measures adaptive or maladaptive guilt feelings, we assessed rumination about being overweight with a short 4-item scale developed for this study ("I can't think of anything else than being overweight"; "Worries about my weight block my thoughts"; "The thoughts about being overweight do not leave my mind"; "I often brood about my weight"). The targeted construct is best described as the distressing preoccupation with one's weight. The scale was administered with a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

3.2.5 Statistical Analyses

Means, standard deviations, and corrected item-total correlations were computed using ITAMIS-PC (Diehl & Staufenbiel, 2002), which is a small but powerful program designed for psychometric analysis. Cronbach's (1951) alphas and mean item-item correlations were computed to test the internal consistency of the scale and its subscales. To study the factor structure of the WEB-SG, we used exploratory factor analysis (EFA) as well as confirmatory factor analysis (CFA). For that purpose, we divided the total sample randomly into two subsamples (n_1 = 166; n_2 = 165). First, we employed MINRES (MINimum RESiduals) EFA (n_1 = 166). MINRES is based on the direct minimization of least squares and is known to be robust concerning any distributional assumptions (Jöreskog, 2003). In addition to the oblique rotation (promax), we included the orthogonal rotation (varimax) for an easier interpretation of the factorial structure. Second, we conducted maximum likelihood CFA using LISREL Version 8.54 (Jöreskog & Sörbom, 2003) (n_2 = 165). The tested models included (a) a two-factor model with correlated factors and (b) a single-factor model with all items loading on one factor. The correlation matrix was employed. Beside the minimum fit function chi-square value, we employed the root mean square error of approximation (RMSEA; Steiger, 1990), the standardized root mean square residual (SRMR; Jöreskog &

Sörbom, 1981), and the comparative fit index (CFI; Bentler, 1990). The *SRMR* is defined as the square root of the mean of the squared standardized residuals and describes the average discrepancy between the observed and the expected correlations across all parameter estimates, whereas the *RMSEA* is a population-based index estimating the lack of fit of the model to the population covariance matrix (Schermelleh-Engel, Moosbrugger, & Müller, 2003). An *RMSEA* of .08 should not be exceeded (Jöreskog, 1993). For the *RMSEA*, we reported 90% confidence intervals (CI90). Concerning the *SRMR*, a value not greater than .10 is considered to indicate good fit. Concerning model comparison, the CFI is often used in small samples since it avoids underestimation of good fit. Values range between 0 and 1. A value above .96 is indicative of good fit (Schermelleh-Engel et al., 2003). To compare the factor structure of women and men, we calculated the coefficient of congruency (FC; Gebhardt, 1967) and an inferential test statistic *w* (Shakun, Maguire, & Hakistan, 1976). An *FC* value above .95 is considered to indicate high congruency of factor structures. A test statistic *w* smaller than a critical value ($w_{p<.05}$ = .254) indicated no significant differences in factor structures.

To estimate the incremental validity of our measure, hierarchical regression analyses were calculated. We did not report standardized betas, as multi-collinearity was high in the variable sets. We analyzed data using SPSS (Version 11.0.1).

3.3 Results

3.3.1 Factor Structure

EFA (MINRES) revealed two factors accounting for 32.3% and 27.5% of the variance in the WEB-SG responses, respectively (Table 3.2). A clear pattern of two subscales was visible in the item loadings of the orthogonal rotation (varimax). Item numbers 2, 4, 6, 7, 10, and 12 showed high loadings on the first factor (Shame subscale), whereas item numbers 1, 3, 5, 8, 9, and 11 showed high loadings on the second factor (Guilt subscale). On a theoretical basis, we expected the two subscales to be moderately correlated. For that reason, we conducted an additional oblique rotation (promax) to assess the degree of factor intercorrelation. This was calculated to be .64.

Maximum Likelihood CFA confirmed the two-factor solution. Concerning the two-factor model, we allowed each set of six WEB-SG items (first set: 2, 4, 6, 7, 10, 12; second set: 1, 3, 5, 8, 9, 11) to load freely on a single factor. We freely estimated the correlation between the two latent factors ($\phi = .70$). Minimum fit function chi-square for the two-factor model was 142.87 ($df = 53$), $p < .001$; *RMSEA* (CI90) = .08 to .12; *SRMS* = .05; CFI = .97. Because all items showed rather high loadings (.33–.91) on the first factor in the unrotated factor solution of the EFA, we also tested a single-factor model. Minimum fit function chi-square for the single-factor model was 310.77 ($df = 54$), $p < .001$; *RMSEA* (CI90) = .17 to.21; *SRMS* = .10; CFI = .91. The decrement in fit associated with the one-factor model was significant, $\chi^2(1) = 310.77 - 142.87 = 167.9$, $p < .05$. Table 3.2 gives an overview of the factor analytic results.

3.3.2 Psychometric Properties of the Items and Subscales

Table 3.3 shows item means, standard deviations, and corrected item-total correlations computed in relation to their 6-item subscale. All item means ranged between 1.2 and 2.7 with standard deviations close to 1 (item scoring: 0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, 4 = *always*). All item-total correlations reached values above .50. Subscale means were satisfactorily close to the midpoint 12 of the scale ($M_{shame} = 10.69$, $SD = 6.66$; $M_{guilt} = 13.84$, $SD = 5.15$). The mean item-item correlation for the Shame subscale (.69) was higher compared to the Guilt subscale (.52). Alpha coefficients (Cronbach's alpha) were excellent for both subscales ($\alpha_{Shame} = .92$; $\alpha_{Guilt} = .87$). Kolmogorov-Smirnov tests of the distributions of scores indicated that the Guilt subscale scores were normally distributed (skew = –.09; kurtosis = –.36), but this was not the case for the Shame subscale scores (skew = .26; kurtosis = –.90). Spearman intercorrelation of the subscale scores ($r_{Shame\ x\ Guilt}$) was .64, which indicated related but not redundant subscales.

3.3.3 Test-Retest Reliability

We examined the temporal stability of the WEB-SG by calculating intraclass correlation (ICC) indexes (two-way, mixed). Of the consecutively assessed participants, 98 completed the follow-up survey 6 months after the baseline survey (no intervention) with an attrition rate of 12.5%. The ICC of the Shame and Guilt subscale reached .79 and .72, respectively. We also checked for differences in subscale scores between Time 1 (T1) and Time 2 (T2) by means of *t* tests, which showed no significant differences: $M_{\text{Shame, T1}} = 11.38$; $M_{\text{Shame, T2}} = 10.58$; $t_{\text{Shame}}(97) = -1.27$, $p > .20$, $d = .13$; $M_{\text{Guilt, T1}} = 14.39$; $M_{\text{Guilt, T2}} = 13.49$; $t_{\text{Guilt}}(97) = -1.65$, $p > .10$, $d = .17$.

3.3.4 WEB-SG, BMI and Demographic Variables

Significantly higher means for women were evidenced for both the Guilt subscale ($M_{\text{women}} = 14.71$; $M_{\text{men}} = 11.83$); $t(329) = 4.87$, $p < .001$; $d = .58$, and the Shame subscale ($M_{\text{women}} = 12.43$; $M_{\text{men}} = 6.85$); $t(329) = 7.93$, $p < .001$, $d = .94$. For the *t* test performed with the Shame subscale, equal variances were not assumed based on Levene's test (M. B. Brown & Forsythe, 1974) for equality of variances. High internal consistency estimates were found on the Shame and Guilt subscale for both women ($\alpha_{\text{Shame}} = .91$; $\alpha_{\text{Guilt}} = .86$) and men ($\alpha_{\text{Shame}} = .92$; $\alpha_{\text{Guilt}} = .86$). An EFA performed separately for women and men indicated similar factor structures with the factors accounting for 64.4% and 66.7% of the variance, respectively. The FC value reached .98, and the factor structures did not differ significantly ($w = .11$).

Product-moment correlation between participants' age and the Shame subscale scores was significant, although effect size was small ($r = -.18$, $p < .01$), whereas the product-moment correlation between age and the Guilt subscale scores was not significant ($r = -.08$, $p > .15$). Visual examination of the scatterplot did not suggest any nonlinear relationship between these variables. There was a small but significant correlation between the participants' BMI and shame ($r = .21$, $p < .01$) but not with guilt ($r = .10$, $p > .05$). With regard to educational level, analyses of variance did not yield any significant group mean differences on either subscale: WEB-Shame, $F(2, 328) = 1.27$, $p > .20$, $\eta^2 = .009$; WEB-Guilt, $F(2, 328) = 1.03$, $p > .30$, $\eta^2 = .007$.

3.3.5 Incremental Validity

We separately conducted a series of linear regression analyses to predict collateral measure scores from guilt- and shame-related scales (Table 3.4). We used hierarchical regression procedures entering the SG-Shame or SG-Guilt subscale first and in a second step, the WEB-Shame or WEB-Guilt subscale. We did not include Distress-SG, as the scale did not assess guilt and shame feelings separately. Entering WEB-Shame in the second step, we observed significant changes in R^2 for most regressions, such as body self-acceptance (+.19), depressive symptoms (+.09), self-esteem (+.06), and rumination (+.09). The only exception was dietary restraint, of which zero variance could be explained by both shame subscales. We observed a similar pattern when considering WEB-Guilt, although the total amount of variance as well as the changes in R^2 were smaller for body self-acceptance (+.13), depressive symptoms (+.07), and self-esteem (+.03). For rumination, the change in R^2 reached .12 by entering WEB-Guilt, but the total amount of explained variance did not exceed the level reached by the Shame subscales. Again, restraint eating was the exception, as no further variance could be explained by entering WEB-Guilt.

3.3.6 Discriminant Validity of the WEB-SG Subscales

To examine separate and independent associations, we present Pearson correlations between the WEB-Shame and WEB-Guilt subscale with collateral measures (Table 3.5). Substantial associations of both subscales with all collateral measures could be observed except for dietary restraint. The correlations with body self-acceptance and self-esteem were negative, as both measures tap the presence rather than the absence of the construct in measure. Overall, the differences in Pearson correlations between subscales were not remarkable. After conducting *t* tests for dependent correlations (two sided; $\alpha = .05$), the differences between correlations for the Shame and Guilt subscales were significant for SG-Guilt ($.42 < .63$) and self-esteem ($-.50 > -.35$). To account for the common variance between the subscales, we calculated partial correlations where WEB-Guilt was factored out of WEB-Shame and vice versa. In contrast to the Pearson correlations, a distinct pattern of associations

was visible after factoring out WEB-Shame or WEB-Guilt, respectively. As expected, the WEB-Shame remained substantially associated to SG-Shame, Distress-SG, body self-acceptance, depressive symptoms, self-esteem, and ruminative thoughts about being overweight. After controlling for the variance of WEB-Shame, the WEB-Guilt subscale still showed substantial correlations with SG-Guilt and rumination about being overweight. The relations to SG-Shame, Distress-SG and body self-acceptance remained significant but did not exceed a coefficient of .25. Again, it was surprising that dietary restraint showed no significant association to either of the subscales. In particular, we had expected WEB-Guilt to be associated with the behavioral tendency to restrain one's diet.

3.4 Discussion

In this article, we describe the development and validation of a 12-item measure for body shame and guilt concerning weight control. It was developed in response to a perceived need for a short, easy-to-administer, self-report measure assessing the frequency of shame and guilt feelings as they separately relate to obesity. The results of the study indicate that the WEB-SG is a psychometrically sound, reliable, and valid instrument for measuring the frequency of feelings of body shame and guilt concerning weight control in a sample of obese individuals. The subscales were found to have excellent internal consistencies, corrected item-total correlations, and well-distributed item means. The results of the factor analyses of the responses confirmed the two-factor conceptualization of the scale and reproduced the theoretically derived item sets to measure body shame and guilt concerning weight control. The moderate intercorrelation of the shame and guilt subscale scores as measured by WEB-SG (r = .64) were comparable to those of other studies using different measures like SG (r = .75; Burney & Irwin, 2000) or BIG-SS (r = .59; Thompson et al., 2003). This points to the interpretation of a population-based value rather than a coefficient resulting from the sample or measure in use.

The 6-month test-retest reliability of both subscale responses calculated by employing ICC showed consistency over time. The consistency in responding

was not surprising given that the instructional set for the WEB-SG focuses on a 6-month window. Therefore, the shame and guilt reactions to body weight measured by the WEB-SG may be interpreted as being consistent over time given that the person's situational contexts do not change. Kocherscheidt, Fiedler, Kronmüller, Backenstraß, and Mundt (2002) came to the same conclusion with general shame and guilt. We expected body shame to be more stable across time than guilt feelings because theoretically, body shame is linked more strongly to self-esteem. In contrast, guilt focuses on behavioral, more variable shortcomings. Surprisingly, the ICC of both the shame (.76) and guilt (.72) responses were almost equally high.

Body shame and guilt concerning weight control were found to be only weakly associated to BMI, gender, or age in our study. Starting with the BMI, participants reported a varying frequency of guilt and shame feelings concerning their weight almost independently of the level of obesity. This is an important finding, as the emotional burden of obesity might be independent of the actual weight. However, we investigated on a limited range of BMI (> 30), and therefore, variance might be limited in our sample. Concerning gender, women reported slightly more frequent weight- and body-related feelings of shame and guilt. This result was also found in other studies measuring general shame and guilt (Gross & Hansen, 2000; Lutwak & Ferrari, 1996). Women might experience higher levels of social pressure to be thin than men. Gross and Hansen (2000) explained the gender difference with the notion that women tend to value interpersonal relationships more than men as a result of their socialization and are therefore more prone to the interpersonal experience of shame. Moreover, men seem to estimate their implicit weight identity as lighter than their actual weight status (Grover, Keel, & Mitchel, 2002) and might feel less ashamed even if weight status is the same as compared to a female counterpart. In our sample, we found shame scores were inversely related to age ($r = -.18$), which might be explained by the finding that elderly individuals tend to rate their general emotional well-being more positively than younger individuals (Clarke, Marshall, Ryff, & Rosenthal, 2000). Furthermore, younger individuals might experience more normative pressure concerning their body appearance compared to older individuals. We could not find any

significant differences on subscale scores between different educational levels. Therefore, education does not seem to have any influence on the self-report in the case of the WEB-SG.

Incremental validity was evidenced by examining the relationship between the two subscales and collateral measures employing stepwise hierarchical regression analysis. First, results indicate that the WEB-SG subscales provided greater predictiveness over the existing SG subscales for most collateral measures, particularly for body self-acceptance, depressive symptoms, and ruminative thoughts. This result most likely stems from the fact that our measure covers broader concepts of guilt and shame compared to the SG. Second, it is noteworthy that in our sample, the WEB-SG subscales failed to account for a significant amount of explained variance of dietary restraint. In particular, we had expected the WEB-Guilt subscale to be substantially associated with dietary restraint because theoretically, dietary restraint is supposed to be a guilt-inherent corrective action in obese individuals. The latter result could be interpreted in two ways: (a) that either the frequency of experienced body shame and guilt concerning weight control reported by obese individuals is independent of the reported calorie restriction or (b) that the WEB-SG subscales simply failed to tap the corrective action of restricting one's diet. In contrast to normal weight samples where the relationship between guilt and shame about eating and eating disturbance could be evidenced (Burney & Irwin, 2000; Frank, 1991), the results of our study did not identify such an association in an obese sample. This was in spite of our measure including three items tapping guilt about eating. Regarding the first interpretation (a), some obese individuals might experience shame or guilt feelings about their body and their eating without necessarily reducing their calorie consumption. Instead, they may choose other coping strategies such as social withdrawal (Puhl & Brownell, 2003), constant self-criticism or ruminative thoughts about the unresolved behavioral transgression. Third, the results of the Pearson and partial correlations were consistent with previous research that has suggested shame to be related to indixes of psychopathology (Gee & Troop, 2003; Sanftner et al., 1995; Tangney et al., 1992), that has supported the self-destructive effects of shame feelings as proposed by Lewis (1993). Regarding the WEB-Guilt subscale, results clearly showed that the

subscale refers to potentially maladaptive aspects of guilt such as ruminative and intrusive thoughts about being overweight. Following the distinction of Ferguson and Crowley (1997), guilt as measured by the WEB-SG may partly be considered ruminative.

An advantage of the WEB-SG is that it provides a possible differentiation between behavioral and emotional consequences associated with weight- and body-related guilt and shame. Future studies addressing specific consequences of the two emotions are feasible. For example, shame and guilt feelings might have diverse predictive effects on weight loss and/or psychological well-being. Shame might be more predictive of mental health problems, whereas guilt might be linked to weight loss trials. Furthermore, the developmental sequence of obesity, body shame, and guilt concerning weight control warrants further empirical scrutiny. Body shame might be a cause of guilt feelings and reparative action, whereas being overweight itself might be a trigger for body shame in a subsample of obese individuals. The results of the current study indicate that subgroups might exist with different developmental sequences concerning the discussed variables because only some participants felt shame about their body. The identification of these subgroups would have practical implications for the therapy of obese individuals. That is, with regard to obesity, body shame could emerge as a more important consideration than weight-related guilt. Again, this issue needs further investigation.

Although the use of self-report measures is recommended for assessing emotional states, they only provide information about conscious and recalled experiences of past shame and guilt feelings. One may argue that a strength of the study is the employment of an interview in addition to the questionnaire. Even though we had a considerably diversified and large sample, we have to take self-selection into account. Participant acquisition of individuals may have been biased by monetary incentives or the willingness to take part in a study run by a psychological department. Additionally, the BMI was defined to be above 30; thus, variance may have been limited. Further replication and cross-validation of these findings in other samples, particularly in clinical samples, is needed. Furthermore, the results are only correlational in nature so that no conclusions regarding causality or the developmental sequence of shame and guilt in obese individuals can be drawn. Finally, we note that our

study used the German version of the WEB-SG. The English translation may yield different psychometric properties due to cultural and language differences.

In conclusion, the WEB-SG is a brief, psychometrically sound measure for assessing body shame and guilt concerning weight control in obese individuals. It was a reliable measure, showed good convergent validity, and the guilt and shame subscales display discriminant correlational patterns to other scales. The scale could be useful for researchers or clinical practitioners to scrutinize diverse effects of body shame and guilt concerning weight control measured by the WEB-SG. Further research is needed regarding discriminative validity and the utility of the measure in clinical settings.

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3.6 Tables

Table 3.1

Demographics of the Respondents

Demographic	
Female (%)	68.9
Mean age (SD)	45.50 (13.28)
Mean BMI (SD)	36.07 (5.18)
Living with partner (%)	71.1
Educational level (%)	
low	38.9
medium	34.1
high	27.0

Note. $N = 331$. BMI = body mass index.

Table 3.2

Factor Loadings for EFA and CFA of the WEB-SG Items

	MINRES EFA (n = 166)					ML CFA (n = 165)	
	Varimax		Promax				
Item	Factor 1	Factor 2	Factor 1	Factor 2	Com	Factor 1	Factor 2
2	.82	.26	.95	-.07	.74	.94	-
4	.84	.30	.90	.02	.79	.93	-
6	.88	.25	.90	-.01	.83	.91	-
7	.67	.32	.59	.18	.56	.80	-
10	.61	.34	.45	.28	.49	.70	-
12	.60	.40	.40	.37	.52	.74	-
1	.40	.78	.05	.85	.76	-	.75
3	.36	.76	-.01	.86	.71	-	.74
5	.25	.60	-.02	.66	.42	-	.64
8	.16	.57	-.07	.62	.36	-	.68
9	.24	.78	-.06	.81	.66	-	.82
11	.36	.48	.25	.40	.36	-	.70
Eigenvalues	3.88	3.3					
% explained variance	32.3	27.5			59.8		

Note. EFA = explanatory factor analysis; CFA = confirmatory factor analysis; WEB-SG = Weight- and Body-Related Shame and Guilt Scale; MINRES EFA = minimum residual EFA; ML CFA = maximum likelihood CFA; Com = Communalities of the MINRES EFA. Item numbers indicate the presented order.

Table 3.3

Means, Standard Deviations, and Corrected Item-Total Correlations of the WEB-SG

Item		*M*	*SD*	$r_{it\text{-}c}$
	Shame subscale			
2	When I am in a situation where others can see my body (e.g., pool, changing room), I feel ashamed.	2.21	1.29	.83
4	The appearance of my body is embarrassing for me in front of others.	2.05	1.26	.85
6	When I think of the possibility that others can see my naked body, I would rather hide somewhere.	1.92	1.39	.86
7	I am ashamed of myself when others get to know how much I really weigh.	2.10	1.42	.75
10	I avoid exerting myself physically in front of others since I feel embarrassed.	1.21	1.14	.70
12	Since the size of my clothes is embarrassing for me, I would rather avoid shopping for new clothes.	1.21	1.29	.72
	Guilt subscale			
1	When I have eaten more than I want, I experience feelings of guilt.	2.14	1.22	.73
3	When I eat fattening food (e.g., tarts), I get distressed by the feeling that I did something wrong.	1.92	1.19	.73
5	When I can't manage to work out physically, I feel guilty.	1.98	1.11	.60
8	When I can't get a grip on my weight, I blame myself.	2.66	1.03	.57
9	I blame myself when I break a good resolution concerning my eating.	2.43	1.09	.75
11	When I watch myself in the mirror, I feel guilty and decide to do more for my figure.	2.69	1.01	.59

Note. $N = 331$. WEB-SG = Weight- and Body-Related Shame and Guilt Scale; $r_{it\text{-}c}$ = corrected item-total correlation computed in relation to its 6-item subscale. Item numbers indicate presented order. Original version was presented in German language. Item scoring: 0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, 4 = *always*. The German version may be obtained from M. Conradt.

Table 3.4

R^2 Change in Hierarchical Regression Analyses Predicting Collateral Measure Scores

Analysis 1	Body Self-Acceptance	Depressive Symptoms	Self-Esteem	Dietary Restraint	Rumination
SG-Shame	.21**	.15**	.23**	.00	.42**
WEB-Shame	.19**	.09**	.06**	.00	.09**
Total variance	.40	.24	.29	.00	.51
Analysis 2					
SG-Guilt	.16**	.07**	.12**	.06**	.27**
WEB-Guilt	.13**	.07**	.03*	.00	.12**
Total variance	.29	.14	.15	.06	.39

Note. $N = 327$. SG-Shame and SG-Guilt = Shame and Guilt Eating subscales; WEB-Shame and WEB-Guilt = Weight- and Body-Related Shame and Guilt subscales.
* $p < .01$. ** $p < .001$.

Table 3.5

Pearson and Partial Correlations for the WEB-SG Subscales to Indixes of Psychopathology

	Pearson		Partial correlations: Residuals	
Subscale	Shame	Guilt	Shame	Guilt
SG-Shame	.64*	.55*	.44*	.24*
SG-Guilt	.42*[a]	.63*	.02	.52*
Distress-SG	.69*	.59*	.51*	.25*
Body self-acceptance	−.63*	−.54*	−.45*	−.22*
Depressive symptoms	.48*	.37*	.35*	.08
Self-esteem	−.50*[a]	−.35*	−.40*	−.04
Dietary restraint	.07	.15	−.04	.14
Rumination	.65*	.60*	.43*	.30*

Note. N varied from 327 to 331. WEB-SG = Weight- and Body-Related Shame and Guilt Scale; SG = Shame and Guilt Eating Scale; SG-Shame = SG Shame subscale; SG-Guilt = SG Guilt subscale; Distress-SG = Distress about shame and guilt feelings measured by the interview.
[a] *t* tests for dependent correlations indicate significant differences between the correlations for the shame and guilt subscales; $p < .05$ two-sided.
* $p < .001$ with Bonferroni correction.

4 Manuscript II: Who Copes Well? Obesity-Related Coping and Its Associations With Shame, Guilt, and Weight Loss

4.1 Introduction

The aim of this longitudinal study was to determine the associations among weight-related coping responses, weight- and body-related shame and guilt feelings, and weight change over 6 months in a nonclinical sample of obese individuals. Obesity is a physiological and psychological burden for the individuals who suffer from it. In comparison to unemployed long-term sick leave patients, obese individuals estimated their weight situation as more difficult to handle (Nilsson et al., 1997). In obesity research, little information has been gathered about the psychological mechanisms involved in coping with obesity – related either to weight management (Byrne, 2002) or to emotional well-being (Doll et al., 2000). The way of coping with weight-related issues might have a great impact on obese individuals' general well-being. In this study, the authors hypothesized that weight-related guilt and shame feelings could be prospective predictors of coping responses in obesity.

4.1.1 Weight-Related Coping and Emotional Well-Being

Disengaging coping strategies seem to be positively related to psychological distress. Myers and Rosen (1999) found that the frequency of experienced stigmatization was positively associated with the frequency of coping attempts (r = .61) in a sample of obese individuals. Furthermore, disengaging coping strategies (negative self-talk, crying/isolating, avoiding/leaving situation) were significantly associated with measures of negative psychological adjustment, even after controlling for the variance of body weight. In a study by Rydén et al. (2001), the disengaging coping strategy "wishful thinking" was significantly associated with helplessness and intrusion (impact of obese state on one's life), whereas engaging strategies like "social trust" and "fighting spirit" were negatively related to the two distress factors.

4.1.2 Weight-Related Coping and Weight Change

Specific coping responses seem to support long-term weight loss, whereas other coping strategies may be linked to emotional distress and relapse. Kayman, Bruvold, and Stern (1990) compared coping responses to troubling issues, events, or situations, between weight relapsers, weight maintainers, and individuals of a control group. Relapsers reported significantly more disengaging strategies (escape-avoidance) than maintainers and individuals of the control group. On the other hand, maintainers and control group individuals reported significantly more engaging coping strategies like problem solving/confronting and seeking social support. In another study, Drapkin, Wing, and Shiffman (1995) investigated the ability to generate coping responses to hypothetical high risk situations. Hypothetical situations were, for example, eating while watching TV or eating at family mealtime celebrations. The authors found that the ability to generate engaging coping responses at baseline was a predictor of weight loss after 12 months.

4.1.3 Weight-Related Shame- and Guilt-Based Reactions

Weight-related feelings of shame and guilt could be crucial factors for coping responses in obesity. In current conceptualizations (Lewis, 1993), shame is described as a highly negative emotional state accompanied by feelings of being exposed or worthless. Shame elicits the behavioral tendency to hide, disengage, or withdraw. Guilt is characterized as less distressing than shame (Tangney et al., 1996), and it is likely to elicit some corrective action after a failure or a behavioral transgression. Regarding obesity, weight-related shame might elicit a more disengaging coping response including self-criticism, social withdrawal, and problem avoidance. Therefore, weight-related shame might have a significant impact on the emotional well-being of obese individuals. In contrast, weight-related guilt might elicit more engaging, corrective coping responses. These might include problem solving and weight control behaviors such as a change of eating habits. Engaging coping responses are more likely to predict weight change (Drapkin et al., 1995; Kayman et al., 1990).

Empirical evidence points to the validity of shame- and guilt-based reactions in obesity. A primary source for shame feelings in obesity is social

discrimination (Puhl & Brownell, 2003). Weight-based stigmatization is a common experience for obese individuals and a well-known source for psychological distress (Friedman et al., 2005; Kolotkin, Crosby, Kosloski, & Williams, 2001; Myers & Rosen, 1999). The more frequently stigmatizing experiences occur, the greater the reported distress; namely, depressiveness, general psychiatric symptoms, body image disturbance, and lowered self-esteem (Friedman et al., 2005; Myers & Rosen, 1999). Friedman et al. (2005) hypothesized that stigmatizing experiences might serve as a trigger for a body shame response in a subgroup of obese individuals. As a consequence, obese individuals who are prone to feel shame might feel worthless and tend to withdraw from society.

Sources for guilt might be transgressions like overeating or not exercising. Also, failed weight control attempts are mostly attributed internally by obese individuals (Goodrick et al., 1992; Jeffery et al., 1990). That means that most obese individuals find the reasons for failure in themselves. In contrast, the empirical likelihood of successful weight reduction is very small and long-term weight loss maintenance is difficult (Anderson et al., 2001; Jeffery et al., 2000; Sarlio-Lähteenkorva et al., 2000). Unsuccessful weight loss attempts might trigger guilt, which, in turn, might trigger corrective actions like further dieting or exercising.

Only a few studies explicitly investigate body- or weight-related shame and/or guilt. Four such studies reported body shame to be strongly associated with eating disturbance in normal weight individuals (Burney & Irwin, 2000; McKinley & Hyde, 1996; Swan & Andrews, 2003; Tiggemann & Kuring, 2004), and there is evidence for the association between body shame and depressiveness (Tiggemann & Kuring, 2004). Only one study has investigated an obese sample, although not differentiating between guilt and shame subscales: Burk-Braxton (1996) reported about overweight individuals after successful weight loss. Based on a period of at least 8 months after the successful weight loss, she divided the sample in maintainers and nonmaintainers. Nonmaintainers reported significantly higher scores on a measure of shame and guilt compared to maintainers and normal weight control individuals.

To our knowledge, no study has evaluated the associations among coping responses, body- and weight-related shame and guilt, and weight change in a sample of obese individuals. Since weight-related shame and guilt are considered to be rather stable constructs (Kocherscheidt et al., 2002), it was hypothesized that baseline shame and guilt would explain an independent part of the variance of the coping responses at the follow-up stage, even when controlled for the variance of baseline coping responses. Furthermore, shame and guilt might have a prognostic relevance to the outcome of future weight loss trials. Objectives of the present study are therefore (a) to present a description of typical distressing situations for obese individuals, (b) to determine whether baseline feelings of guilt and shame can predict subsequent coping responses, and (c) to determine associations between coping responses and weight change. A significant prediction of weight-related coping through feelings of guilt and shame might give valuable information for therapeutic interventions.

4.1.4 Choice of Collateral Measures

Apart from weight-related coping responses and feelings of shame and guilt, two other constructs were measured: The construct depressiveness was included based on the theoretical and empirical finding that shame elicits the tendency to hide, disengage, or withdraw, which might simply be considered as aspects of depression (Andrews et al., 2002). To operationalize the behavioral consequences of guilt, a measure of dietary restraint was used. Restricting one's diet might be regarded as a coping effort to make up for past transgressions concerning eating.

4.2 Method

4.2.1 Participants and Procedure

Participants were obese individuals recruited for a larger study for genetic counseling in Germany. They were told that the aim of the study was to find new insights about the development of obesity and to design new treatment approaches for individuals who suffer from being overweight. Inclusion criteria for the study were a body mass index (BMI – kilograms per meter

squared) of at least 30, an age between 18 and 70 years, and the ability to read and write German. Participants were recruited mostly through collaboration with general practitioners (GPs), but also through posters and press releases. They received €10 for their participation (€1 = $1.54 US). The baseline survey (T1) comprised a questionnaire package and an interview ascertaining relevant information about obesity. After 6 months (T2), the interview was conducted over the telephone and the self-report measures were mailed one week before the telephone appointment. After the follow-up stage, data of 98 participants were complete and appropriate for longitudinal analyses (dropout: 14.8%). Seventy participants were female (71.4 %). Mean age was 47.7 years (*SD* = 12.3). The mean BMI of the sample was 36.7 (*SD* = 5.1). Educational degree was conceptualized according to the standards of the German Federal Health Survey (1998), by combining school qualification and current occupation. Higher education was reported by 15 participants (15.3%), medium education by 31 (31.6%) and low education by 37 (37.8%), whereas 15 participants did not report their education (missing 15.3%). All participants were Caucasian. The mean number of years being obese was 21.9 (*SD* = 13.2). All participants reported that they tried to lose weight in the past. The mean number of weight-loss attempts in the past 2 years was 4.16 (*SD* = 3.67; missing data: *n* = 22). The mean maximum weight loss ever experienced was 15.6 kg (*SD* = 11.1; missing data: *n* = 38). The study was approved by the ethics committee of the Medical School of Marburg.

4.2.2 Measures

At baseline, medical staff assessed weight and height of the participants. At the follow-up stage, the current weight was only assessed via telephone interview.

Coping behavior was assessed with the Coping Strategies Inventory – Short Form (CSI-S; Tobin et al., 1989). This is a 32-item self-report questionnaire designed to assess coping thoughts and behavior in response to a specific stressor. It has eight subscales: problem solving, cognitive restructuring, express emotions, social contact, problem avoidance, wishful thinking, self criticism, and social withdrawal. In the present study, four higher-order subscales named problem-focused engagement (PE; subscales 1 and 2), emotion-focused engagement (EE; subscales 3 and 4), problem-focused

disengagement (PD; subscales 5 and 6), and emotion-focused disengagement (ED; subscales 7 to 8) were used. The instructions were altered by asking participants to describe a typical event or situation in the past 6 months when they became aware of being obese. Tobin (2001) noted that users have the option of requesting a particular type of stressor. Also, an alteration of instructions is not necessarily damaging to the instrument's psychometric properties and reliability (Weyers, Ising, Reuter, & Janke, 2005). Further, it should be noted that participants were only given the option of providing a single nomination; therefore, the questionnaire did not ask how frequently a typical event or situation was experienced. After providing a short description of their specific event or situation, respondents were asked to indicate for each item on a five-point scale (*never, rarely, sometimes, often, always*) how often they performed a particular coping response in dealing with the previously described typical situation. After filling in all items, participants were asked to rate the distress experienced in the formerly described stressful situation on a 4-point scale (1 = *not at all*, 2 = *a little*, 3 = *somewhat*; 4 = *much*). In our sample, some of the four higher-order subscales were significantly correlated with each other: PE x EE ($r = .51$; $p < .01$), PE x PD ($r = -.29$; $p < .01$), PE x ED ($r = .10$; *ns)*, EE x PD ($r = -.04$; *ns*), EE x ED ($r = .14$; *ns*), PD x ED ($r = .26$; $p < .05$). Scores of the four scales can range from 0 to 32. Former analyses of factorial structure of the CSI-S (translated into German) with altered instructions confirmed the results of Tobin et al. (1989) in another obese sample of 264 participants (see Appendix C.1). In a sample of 801 college students, Tobin (2001) reported good Cronbach alpha coefficients for the subscales ranging from .81 to .92. Two-week test-retest reliability ($n = 354$) ranged from .69 to .82.

Guilt and shame associated with obesity were assessed by using the Weight- and Body-Related Shame and Guilt Scale (WEB-SG; Conradt et al., 2007). This is a 12-item scale with two subscales assessing the frequency of experiencing shame concerning the body and the weight in front of real and imagined others (WEB-Shame), and guilt concerning eating habits, exercising, and weight control (WEB-Guilt) during a 6-month period. Subscale scores can range from 0 to 24, with higher scores indicating more frequent feelings of

shame or guilt. In a sample of 331 obese individuals, scale consistency for the German version was high for both subscales (α_{Shame} = .92; α_{Guilt} = .87). Also, the subscales proved to provide a possible differentiation between behavioral and emotional consequences associated with either weight-related guilt or shame.

Depressive symptoms were assessed with the Center for Epidemiological Studies Depression Scale - Short Form (CES-D-S; Hautzinger & Bailer, 1993; Radloff, 1977). It consists of 15 items and scores can range from 0 to 60. Higher scores indicate a more depressed mood. The mean score of the short form in a general population sample (N = 1,205) was 10.72 (SD=8.03; Hautzinger & Bailer, 1993). For the German version, good internal consistency (α = .90) and split-half reliability (r = .90) were reported. Further, the CES-D-S showed high correspondence (97%) with the CES-D in detecting individuals with clinically relevant depression scores.

Dietary restraint was assessed using the Dutch Eating Behavior Questionnaire (DEBQ-R; Van Strien et al., 1986). The scale comprises 10 items describing intentions to restrict food intake for weight reasons. In a study conducted by Laessle, Tuschl, Kotthaus, and Pirke (1989), the German version proved to have good internal consistency (α = .89) and to measure the actual restriction of food intake rather than the drive to be thin. Like Laessle et al. (1989), a 5-point scale from 0 (*never*) through 2 (*sometimes*) to 4 (*always*) was used in this study; therefore, scores can range from 0 to 40, with higher scores indicating more restrained eating.

At baseline, the intention to lose weight in the following 6-month window was also assessed by an interview question ("In the near future, do you want to reduce your weight?" Yes/No).

4.2.3 Statistical Analyses

Levels of obesity refer to grade I (30 ≤ BMI < 35), grade II (35 ≤ BMI < 40), and grade III obesity (BMI ≥ 40). Relative weight change (%) over the 6 months was calculated by the formula ([weight_T2−weight_T1]/weight_T1)* 100. Therefore, negative values indicate the percentage of body weight lost

over 6 months compared to the weight at T1, whereas positive values indicate the percentage of body weight gained.

Concerning the classification of stressful situations, three clinically experienced researchers (two psychologists, one medical doctor) classified the short descriptions of the typical stressful situations reported in the CSI-S by using six categories (see Table 4.2). Categories were adapted from the scales of the Impact of Weight on Quality of Life Questionnaire (Kolotkin, Crosby, Williams et al., 2001) as the only known empirical categorization of weight-related situations in the obesity literature. Pairwise kappa coefficients were calculated to approximate the convergence of the judgments. Discrepancies between the raters' judgments only ever emerged as a 2:1 split. The final classification was determined based on the category chosen by at least two of the researchers in each situation.

To compare the frequencies of stressful situations per level of obesity, a Fisher's exact test (Fisher, 1922) was calculated to see whether the reported frequencies differed from the expected frequencies in case of independence of the levels of obesity. Furthermore, Kruskal-Wallis tests were calculated to compare mean distress ratings of the typical situations between levels of obesity as well as between categories of situations. For the psychometric evaluation, mean scores, standard deviations, and Cronbach alpha coefficients (Cronbach, 1951) were calculated for the baseline data only. To estimate retest reliability, Pearson product-moment correlations between scores of T1 and T2 were calculated. Kolmogorov-Smirnov tests indicated that all scores were normally distributed. The differences in scores between T1 and T2 were tested by *t* tests for repeated measures with Bonferroni corrected significance levels.

To estimate the predicting effects of guilt and shame on coping responses, hierarchical regression analyses were calculated. First, demographic variables, the T1 equivalent coping measure, and the measure of depressive symptoms were entered. In a second step, guilt and shame followed. Variables within each step were entered simultaneously. The coding of gender was "1" for male and "0" for female. Standardized betas were reported, as multicollinearity was low (with tolerances > .10). To estimate differences in coping responses between levels of obesity, repeated measure ANOVAs were calculated. Finally, the sample was divided into weight gainers (4% ≤ weight change; *n* =

16), weight maintainers (–4% < weight change < 4%; n = 60), and individuals who lost weight (weight change ≤ –4%; n = 22) to calculate repeated measure ANOVAs for coping measures (including restrained eating). The cutoff of 4% was chosen as it has shown to be a reasonable and realistic goal in weight loss programs (Anderson et al., 2001). Furthermore, the sizes of the groups were still large enough to employ variance analysis. Data were analyzed by using the SPSS (Version 12.0).

4.3 Results

At baseline, 96 participants (97.9%) indicated that they planned to reduce their weight in the near future. At the follow-up stage, 76 participants (77.5%) stated that they had tried actively to lose weight in the past 6 months. The majority reported that they were dieting and exercising (n = 32; 32.7%), with the second largest group of participants indicating that they were only dieting (n = 28; 28.6%). Eight participants reported exclusively using exercise to lose weight (8.2%), 4 participants reported changing their eating habits without dieting (4.1%). Only four of the participants took medication to lose weight (4.1%). No invasive methods (e.g., gastric banding) were reported. Mean relative weight change for the whole sample was –0.55 (SD = 5.44).

4.3.1 Psychometric Properties of the Measures

Table 4.1 gives an overview of the psychometric properties of the measures. Mean scores and standard deviations at T1 indicated adequate sample variance for all measures. Pairwise t tests for repeated measures with Bonferroni adjusted alpha levels ($\alpha < .0125$) indicated significant differences in the regularity with which coping strategies were performed: PE was performed significantly more frequently than the other coping subscales, $t_{(97),\ \text{PE-PD}} = 5.41$, $p < .001$; $t_{(97),\ \text{PE-ED}} = 6.02$, $p < .001$; $t_{(97),\ \text{PE-EE}} = 2.81$, $p < .01$. The mean scores and standard deviations of depressiveness and dietary restraint were slightly higher than those found in other nonclinical samples (Hautzinger & Bailer, 1993; Laessle et al., 1989). Internal consistency (Cronbach's alpha) was good for almost all measures ($\alpha > .75$), except for the scales PE- and PD-coping for

which the coefficients were only moderate. To compare stability indices, product-moment correlations were provided for all repeated measures (r_{tt}). The WEB-Shame and the WEB-Guilt were found to be the most stable scales. All other scales showed lower retest correlations, indicating greater variation between T1 and T2. Furthermore, mean scores of all measures (T2−T1) did not differ significantly over time. In the last column, Pearson correlations between BMI and coping/collateral scores indicated no significant associations, except for the coping subscale EE.

4.3.2 Distressing Situations

Table 4.2 shows the distribution of the typical situations reported at baseline. The categorization for each level of obesity is presented separately. The mean paired kappa coefficient for the three classification judgments was .87 ($p <$ .001), underlining good convergence of the researchers.

The first category, negative evaluation by others or self, was reported most frequently (e.g., comments or looks by others/evaluating own body in mirror), followed by the category physical functioning (e.g., trouble breathing, moving, or exercising). The two categories, eating difficulties and illness/disease, were reported only rarely. The category environmental hazards consisted mainly of trouble with shopping for clothes, and it was unclear whether individuals' distress stems from the missing sizes or from the interaction with the sales personnel. Two participants' answers could not be fitted into either category (e.g., "I am a widow"). Fourteen participants did not specify their situation, but indicated its distressing nature by filling in the distress rating item.

Regarding the three levels of obesity, a Fisher's exact test indicated that the frequencies of situations did not differ significantly from the independence frequency distribution ($P = .869$, Fisher's exact test). For example, the authors had expected the physical functioning category to increase markedly with a BMI over 40. However, the levels of obesity did not differ significantly in terms of relative frequency of situations. Furthermore, a Kruskal-Wallis test was calculated to compare the mean distress ratings of the three levels of obesity, which indicated no significant differences, $\chi^2(2) = 4.58$, $p > .10$. A second Kruskal-Wallis test to compare the mean distress ratings of the

categories did not indicate any significant difference either, $\chi^2(5) = 8.22$, $p > .14$. It should be noted that none of the reported situations was rated as being not at all distressing. Spearman correlations between the distress ratings and the shame and guilt subscale scores revealed significant associations (Distress x Shame: $r = .59$, $p < .001$; Distress x Guilt: $r = .53$, $p < .001$).

4.3.3 Predicting Coping Responses From Shame and Guilt

Table 4.3 presents Pearson correlations between coping and collateral measures at T1. The coping subscales PE and EE did not show any significant associations with any of the collateral measures, although there was a tendency of PE being positively related to the guilt subscale ($r = .19$; $p < .07$). The subscale PD showed significant associations with shame and guilt scores. The correlation indices between the subscale ED and shame and guilt scores were even higher. Also, ED showed a significant correlation with depressive symptoms, indicating that both constructs share commonalities (self criticism, social withdrawal). Finally, there was a small positive correlation between restrained eating and guilt scores.

A series of linear regression analyses was separately conducted to predict T2 coping measure scores from T1 guilt and shame scales (Table 4.4). Hierarchical regression procedures were employed. In the first step, age, gender, T1 BMI, the T1 equivalent coping scale, and the T1 depressive symptom measure were entered. In a second step, the T1 WEB-Shame subscale and the T1 WEB-Guilt subscale were entered. The depressive symptom measure was included to control for general (but not weight-related) negative affectivity. Only the PE subscale and restrained eating scale were significantly predicted by T1 shame or guilt. Regarding the coping subscale PE, the standardized betas of the WEB-Shame ($\beta = -.26$) and WEB-Guilt subscale ($\beta = .25$) at T1 made a significant contribution to explain further variance of T2 PE subscale scores. It should be pointed out that the WEB-Shame subscale was negatively associated to the PE subscale. For the prediction of restrained eating at T2, only the T1 guilt subscale showed a significant beta weight ($\beta = .26$) with a significant increase of explained variance.

4.3.4 Associations Between Coping Responses, BMI and Relative Weight Change

It was already stated that no significant correlative association between BMI and any coping measure (including restrained eating) was found, except the rather small but significant correlation between the subscale EE and BMI (see Table 4.1). To check for possible nonlinear associations, repeated measure ANOVAs were calculated for every coping measure (including restrained eating) to compare mean scores between levels of obesity. None of the repeated measure ANOVAs showed a significant interaction effect (Time x Level of Obesity).

With a chosen cutoff of 4% of body weight, the sample was divided in weight gainers (n = 16), weight maintainers (n = 60), and individuals who lost weight (n = 22) during the 6-month period. Age, gender, or BMI at T1 did not differ significantly between groups. To test for possible differences of coping scores between these groups, repeated measure ANOVAs were calculated. Only the coping subscale PD showed a significant main effect Time, $F(1, 94) = 8.95$, $p < .01$; $\eta^2 = .09$, as well as a significant interaction effect Time x Group, $F(2, 94) = 8.06$, $p < .001$; $\eta^2 = .16$. Post-hoc t tests for repeated measures with Bonferroni adjusted alpha levels ($\alpha < .0167$) revealed that only the weight loss group showed a significant drop on the PD subscale, weight loss group: $M_{T1} = 14.36$, $M_{T2} = 10.14$; $t(21) = -4.12$, $p < .001$; maintainer group: $M_{T1} = 13.52$, $M_{T2} = 14.27$; $t(59) = 1.36$, $p < .18$; weight gainers: $M_{T1} = 16.03$, $M_{T2} = 14.50$; $t(15) = -1.17$, $p < .26$. To test for possible differences regarding the employed weight loss strategies (dieting + exercising, dieting, exercising, medication), the frequency of reported methods were compared between weight change groups. A Fisher's exact test indicated no significant differences ($P = .271$, Fisher's exact test).

4.4 Discussion

The aim of the present study was (a) to present a description of typical distressing situations for obese individuals, (b) to determine whether baseline feelings of guilt and shame would predict subsequent coping responses at follow-up, and (c) to determine associations between coping responses and weight change.

4.4.1 Distressing Situations

Findings suggested that obese individuals became most distressed of being obese in evaluative situations, either through self-evaluation or evaluation by others, and in situations which were related to physical functioning and the inability to perform (moving, exercising) like a normal weight individual. Also, obese individuals often reported to be distressed about finding or shopping for the right clothing. The latter finding makes sense, since one becomes very aware of the body when trying to fit into clothes. These results are in line with other studies (Friedman et al., 2005; Myers & Rosen, 1999), although our findings are based on individuals' recall of significant situations rather than the recognition of situations on a presented list. Surprisingly, situations related to eating or illness were reported very rarely. This could be either due to a minor impact of these situation categories on individuals' awareness of being obese or due to a very healthy sample. From a public health perspective, this may suggest that obese persons are less likely to be swayed by messages conveying the health risks of obesity. They may be more likely to be reached by messages that relate to physical functioning, movement, or clothing.

When considering the differences between the three levels of obesity, it was somewhat unexpected that observed frequencies of the situations did not differ from an independence frequency distribution. In other words, the group of individuals with grade 3 obesity (BMI $\geq$ 40) did not report a higher number of distressing physical functioning situations compared to those individuals with grade 1 obesity (30 $\leq$ BMI < 35). To illustrate the difference in weight between the two grades, one could imagine the same person, 1.70 m (~5.6 ft)

in height, weighing 90 and 120 kg (198 lbs and 265 lbs). However, it should be emphasized that each individual was only asked for a single situation. Individuals could not indicate how often they experienced the typical situation. Although the distribution of nominated situations did not differ between the three groups, there may have been significant differences if one had considered the frequency at which they encountered such situations.

Additionally, the mean distress ratings neither differed significantly between levels of obesity, nor between situation categories. Such findings, namely the independence of relative frequencies of situations and mean distress ratings from the levels of obesity, confirmed an independence of the experienced weight-related distress and the body weight as reported by other studies (Friedman et al., 2005; Myers & Rosen, 1999). Obese individuals' distress about weight-related issues therefore might not be primarily influenced by their current weight. The significant and substantial correlation of the distress ratings with the shame and guilt scores (.59 and .53, respectively) supported the hypothesis of Friedman et al. (2005) that stigmatizing or evaluative experiences might serve as a trigger for a body shame response and cause psychological distress. Body shame itself was found to be not associated to BMI in our study. Thus, weight might play a minor role as a factor for psychological distress in obesity. More likely, the interaction of three variables is crucial for the development of psychological distress in obesity: the frequency of experienced evaluative and distressing situations, internalized antifat attitudes, and feelings of weight-related body shame and guilt.

4.4.2 Coping Responses, Weight-Related Feelings of Shame and Guilt

At baseline, weight-related feelings of shame were substantially and positively correlated with disengaging coping responses (PD, ED). The association between body shame and disengaging coping strategies is a result in accordance with other studies in which global shame was strongly related to indices of psychopathology (Harder, 1995; Harder et al., 1992; Tangney, Burggraf, & Wagner, 1995; Tangney et al., 1992). Our findings are also in line with the association between stigmatizing experiences (resulting in shame) and certain coping strategies (negative self-talk, cry/isolate myself, avoid or leave

situation) reported by Myers and Rosen (1999). Taking the validity of the theory of shame-based reactions (e.g., Lewis, 1993), this result was expected because shame is supposed to be associated with avoiding, disengaging strategies. Our findings confirmed that this might be also true for weight-related shame. Weight-related guilt showed small positive associations to problem-focused disengaging coping and restrained eating, but also a substantial correlation with emotion-focused disengagement coping responses. The association with restrained eating and the tendency to be associated with problem-focused engagement strategies ($r = .19$, $p < .07$) confirmed theoretical considerations that guilt might be more strongly linked to engaging, corrective strategies for past transgressions than shame (Lewis, 1993; Lindsay-Hartz, De Rivera, & Mascolo, 1995).

For obesity, weight-related feelings of guilt might therefore elicit more engaging coping responses than feelings of shame. In fact, hierarchical regression analyses revealed that weight-related guilt was a significant positive predictor for problem-focused engagement (problem solving, cognitive restructuring) and restrained eating, whereas weight-related shame was found to be a negative predictor for problem-focused engagement. All other coping subscales (EE, PD, ED) were not significantly predicted by weight-related guilt or shame. Even though the standardized beta weights for the guilt and shame measures were rather small, one has to consider our conservative approach to control for depressive symptoms as well as the criterion-equivalent T1 coping scale. Taking this into account, the predictive effects of weight-related guilt and shame on coping responses were confirmed in our study. Whereas weight-related shame seems to be related to a decrease in problem-focused coping, weight-related guilt might have a positive effect on the employment of more active coping strategies. As this study is of correlational nature, the associations identified may also suggest that some individuals, for example, are actively dieting and therefore feel guilt for minor transgressions, or that individuals who decrease their efforts in problem-focused coping feel more shame. Independent of the causal nature of these associations, these distinct, but associated feelings should be discussed separately in counseling sessions (cognitive behavioral therapy) about weight issues.

4.4.3 Coping Responses, BMI, and Weight Change

Regarding the reported weight loss strategies, less than half of the participants tried to lose weight with a combined strategy of dieting and exercising. The other participants reported adopting a single strategy. This was a surprising finding, since the recommendation of a combined strategy is widely advertised and recommended. Furthermore, the preferred single strategy was dieting, which contradicts the empirical finding that long-term weight loss is unlikely when engaging in dieting alone. The finding may suggest that the distribution of obesity-related public health messages alone does not provoke healthier behavior. More important, no significant differences were found between weight change groups regarding the weight loss strategies. Alternative factors other than the employed strategy (e.g., a self-motivated cognitive style) might prove to be more important for weight loss, although our interview did not discriminate between different types of diets/exercise. Therefore, the appropriateness of the employed diets/exercise cannot be judged.

Another unexpected result of the study was that BMI did not show any substantial linear association to any of the coping measures. This could mean that the individuals' way of coping with distressing situations related to being overweight might be independent of the level of obesity. This finding was supported by the study of Rydén et al. (2001), where intrusion (impact of obese state on one's life) was related to helplessness, but not to weight itself. On the other hand, we found via group comparison of weight maintainers, weight gainers, and individuals who lost weight a substantial nonlinear effect; that is that the weight loss group reported to have experienced in the 6-month period a significant decrease in strategies such as wishful thinking and problem avoidance (problem-focused disengagement). This is an interesting finding, since Kayman et al. (1990) found that weight relapsers reported more disengaging strategies (escape-avoidance) than weight maintainers. Also, other studies pointed out that disengaging coping strategies (wishful thinking, avoid or leave situation) were associated with negative psychological adjustment (Myers & Rosen, 1999) as well as helplessness and intrusion (Rydén et al., 2001). If weight-related shame and guilt are also considered as measures of psychological adjustment, the results of the study confirmed the association between disengaging coping strategies and measures of psychological

adjustment. Thus, disengaging coping, specifically problem-focused, might influence obese individuals in two ways: If wishful thinking or problem avoidance is employed frequently, obese individuals might experience more distress about their obese state in the form of guilt and shame, but on the other hand might not be able to generate or focus on more engaging coping strategies, which, in turn, might foster weight loss.

4.4.4 Limitations

The current study has several limitations. Weight at follow-up was assessed by self-report (over the telephone) rather than by objective measures, so interpretation of the results about weight change should be made with caution. Whilst self-report measures are recommended for assessing emotional states, they only provide information about conscious and recalled experiences of past feelings of shame and guilt, for example. Also, one has to take self-selection of the recruited individuals into account because they were mostly recruited in GP practices. The recruitment of the participants may have also been biased by monetary incentives or the willingness to take part in a study run by a psychological department. Additionally, the BMI was defined to be above 30, thus the study lacked a comparison with normal weight (BMI < 25) or overweight (25 < BMI < 30) individuals. Regarding the employed methods, although longitudinal, the results can only be considered as correlational, so no conclusions can be drawn regarding causality or the developmental sequence of shame or guilt feelings and related coping strategies in obese individuals. Future studies may address this issue by applying experimental designs to determine the causal effects of these variables, possibly through inducing short-term ways of coping. A general limitation is the generalizability of the results. Investigating a German sample, it is unclear whether the findings would be confirmed in other Western cultures. However, it is unlikely that associations between weight-related guilt, shame, and coping differ fundamentally between Western countries.

4.4.5 Conclusions

First, the current study found that distressing situations were mostly linked to negative evaluation, physical functioning, and environmental obstacles like buying clothes. The mean distress about these situations did not differ between obesity levels and the situation categories themselves. Second, weight-related shame and guilt were substantially and positively associated with disengaging coping responses. Weight-related shame showed some overlap with depressive symptoms, whereas guilt was also associated with engaging coping responses like restrained eating. Predicting coping subscales (and restrained eating) at follow-up from collateral measures, shame and guilt showed opposing predictive effects on problem-focused engagement, with guilt feelings being a positive and shame feelings being a negative predictor. Third, weight loss was accompanied by a substantial drop in disengaging coping responses, namely wishful thinking and problem avoidance. The findings might be of good use for clinical practice. Weight-related guilt and shame might be discussed in a more differentiated way in the therapeutic process. The differentiation could underline the possible positive function of guilt by fostering engaging coping responses. Also, one might focus on the role of disengaging coping strategies (especially wishful thinking and problem avoidance) and their adverse effect on psychological well-being and future weight loss.

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4.6 Tables

Table 4.1

Psychometric Properties of the Measures

	Time 1 *M (SD)*	$t_{t2\text{-}t1,df=97}$§	α†	r_{tt}‡	*r*(BMI)¶
Problem foc. engagement	15.3 (4.09)	1.48	.61	.65	.16
Emotion foc. engagement	13.0 (5.30)	1.32	.80	.58	.21*
Problem foc. disengagement	14.1 (4.80)	−1.48	.64	.51	.00
Emotion foc. disengagement	12.8 (5.25)	−1.49	.77	.69	.05
Depressive symptoms	12.7 (8.52)	−1.64	.91	.57	.02
Dietary restraint	18.0 (6.42)	1.60	.86	.62	−.02
Shame	11.4 (6.53)	−1.24	.92	.79	.11
Guilt	14.4 (5.01)	−1.64	.86	.73	.07

Note. BMI = body mass index. Foc. = focused.
§ *t* tests for repeated measures of time 1 and time 2 scores.
† Cronbach alpha coefficient.
‡ Pearson correlations between time 1 and time 2 scores.
¶ Pearson correlations with BMI at time 1.
*$p < .05$.

Table 4.2

Frequencies of Typical Situations (%) and Mean Distress Ratings at Time 1

Categories	All *N* = 98	30 ≤ BMI < 35 *n* = 47	35 ≤ BMI < 40 *n* = 31	40 ≤ BMI *n* = 20	Mean distress ratings (*SD*)
Negative evaluation by others/ self	37 (37.8)	20 (42.6)	8 (25.8)	9 (45.0)	3.30 (0.78)
Physical functioning	24 (24.5)	11 (23.4)	7 (22.6)	6 (30.0)	3.25 (0.74)
Difficulty with eating	2 (2.0)	1 (2.1)	1 (3.2)	- (0.0)	3.50 (0.71)
Disease or illness	3 (3.1)	2 (4.3)	- (0.0)	1 (5.0)	3.33 (0.58)
Environmental hazards	16 (16.3)	6 (12.8)	7 (22.6)	3 (15.0)	2.88 (0.81)
Other	2 (2.0)	1 (2.1)	1 (3.2)	- (0.0)	2.00 (0.00)
Missing	14 (14.3)	6 (12.8)	7 (22.6)	1 (5.0)	2.71 (0.73)
Mean distress ratings (*SD*)	3.11 (0.79)	3.00 (0.75)	3.10 (0.79)	3.40 (0.82)	

Note. BMI = body mass index.

Table 4.3

Product-Moment Correlations Between Coping and Collateral Measures at Time 1

	Depressive symptoms	Shame	Guilt
Problem-focused engagement	−.16	.04	.19
Emotion-focused engagement	.12	.06	.11
Problem-focused disengagement	.12	.42***	.22*
Emotion-focused disengagement	.47***	.62***	.69***
Dietary restraint	.03	.03	.25*

*$p < .05$; ***$p < .001$.

Table 4.4

Hierarchical Regression Analyses Predicting Coping From Shame and Guilt

	Time 2				
	Problem-focused engagement	Emotion-focused engagement	Problem-focused disengagement	Emotion-focused disengagement	Dietary restraint
Step 1					
Gender	–.10	–.12	.00	.15	–.14
Age	.01	–.12	–.02	.12	.14
T1 BMI	.00	.01	–.03	.05	.08
T1subscale	.60***	.58***	.50***	.72***	.56***
T1 Depressive symptoms	–.20*	.05	.11	.03	–.04
R^2 *adjusted*	.47	.36	.27	.51	.42
Step 2					
T1 Shame	–.26*	–.12	.04	–.12	–.04
T1 Guilt	.25*	.06	.17	.14	.26*
R^2 change	+.05*	-	+.03	+.01	+.05*

Note. T1 = Time; BMI = body mass index. Standardized betas are reported.
*$p < .05$; ***$p < .001$.

5 Manuscript III: A Consultation With Genetic Information About Obesity Decreases Self-Blame About Eating and Leads to Realistic Weight Loss Goals

5.1 Introduction

This study tested the effects of a consultation using genetic information about obesity on attitudes about weight loss goals, self-blame about eating, and weight-related coping in obese individuals. Based on twin and population studies, genetic factors are estimated to explain between 50% to 90% of the variance in body mass index (BMI) (Faith et al., 1999; Maes et al., 1997) and influence differences in BMI throughout the lifespan (Hewitt, 1997). Furthermore, there is a growing body of research on genetic markers for obesity (Hinney et al., 2008), making personal risk feedback consultations more likely in the future. Using information about the influence of genetics on the development and maintenance of obesity could encourage an obese person to develop healthier strategies concerning weight management (e.g., to set more realistic weight loss goals) or to improve emotional well-being (e.g., less self-criticism about body weight). However, such an approach has to consider the negative connotations attached to the word *genetic*, for example, the assumption that a phenomenon with a predominantly genetic origin is not controllable (Marteau & Croyle, 1998).

A consultation focusing on genetic factors aims to convey the message that the heritability of body weight is high, and that the likelihood of losing weight long-term is lowered if an individual shows a familial predisposition to obesity. An obese individual informed about having a familial predisposition might show positive reactions that include a decrease in self-blame about eating and overeating (control attribution to genes). This could be helpful because high levels of self-blame about eating proved to be associated with weight regain (Burk-Braxton, 1996) and depressive symptoms (Frank, 1991). Furthermore, the feedback about genetic susceptibility could cause an adjustment to more realistic weight-loss expectations. Exaggerated weight-loss expectations have shown to predict attrition in obese individuals seeking

treatment (Grave et al., 2005), and it is well known that obese individuals overestimate their weight loss capability: In a sample of 128 obese individuals with a mean weight of 99.1 kg (*SD* = 12.3), an average weight loss of 17 kg was considered to be disappointing and not successful, which refers to a 17% weight loss (Foster, Wadden, Vogt et al., 1997). In contrast, a weight loss of only 5% of initial weight has shown to be associated with improving health (Wadden & Frey, 1997). Therefore, more realistic weight loss goals are considered positive for commitment to a weight loss intervention without neglecting health benefits.

The negative reactions to a consultation using genetic information might include feelings of hopelessness and less active coping responses to deal with weight-related issues. Weight-related coping has proven to be an important factor in weight management and emotional adjustment in obesity. Disengaging coping strategies like negative self-talk, wishful thinking, or problem avoidance were significantly associated with measures of negative psychological adjustment (Myers & Rosen, 1999) and feelings of helplessness (Rydén et al., 2001). Concerning stability after weight reduction, relapsers reported significantly more disengaging strategies (escape-avoidance) than maintainers and individuals of the control group (Kayman et al., 1990). On the other hand, maintainers and control group individuals reported significantly more engaging coping strategies like problem solving/confronting and seeking social support. Finally, another negative consequence could be the labeling as genetically burdened which might also stigmatize the individual: Obese individuals might interpret the familial predisposition as an undesirable characteristic or defect (Phelan, 2002).

Existing empirical evidence about the effects of consultations using genetic information on an individual's psychological status is contradictory: The results of a vignette study by Frosch, Mello, and Lerman (2005) indicated that the effects of receiving the information of an increased risk of becoming obese resulted in stronger intentions to eat a healthy diet. Interestingly, within the genetic test group (vs. hormone test group), those who were told they were at an increased risk of becoming obese indicated lower perceived behavioral control compared to those who were told they were at average risk. The authors concluded that their results might reflect a sense of fatalism stemming

from the belief that genetics are immutable. In contrast, one study concluded that genetic status information has at least no negative effects on obese individuals (Harvey-Berino et al., 2001). The study compared obese individuals who tested positive or negative for the β3-adrenergic receptor (β3AR) gene which was found to influence weight gain and energy expenditure. After receiving information about their genetic status, individuals who tested β3AR-positive were not adversely affected concerning their subjective ability to lose weight or control their eating behavior. In the preliminary analysis of this trial, Rief et al. (2007) concluded that the inclusion of genetic information is useful for those participants with a familial predisposition for obesity, while the subjective well-being of obese people without a familial predisposition increased if they received a consultation without genetic information. However, in those preliminary analyses, the relevance of weight-related attitudes, weight-related coping, and self-blame about eating was not analyzed.

5.1.4 Hypotheses

The following main hypotheses were tested. (a) Obese individuals with a familial predisposition who receive a consultation with genetic information about obesity, and feedback about their personal familial predisposition, show a decrease in self-blame about eating transgressions, develop more realistic weight loss expectations, but also show a decrease in engagement coping in weight-related situations compared to obese individuals without a familial predisposition. (b) Obese individuals without a familial predisposition who receive a consultation with genetic information about obesity, and feedback about their missing personal familial predisposition, show an increase in self-blame about eating transgressions, less adjustment of weight loss expectations, and an increase in engagement coping with weight-related situations compared to obese individuals with a familial predisposition. Furthermore, we hypothesized that (c) the feedback about a familial predisposition could yield to an increase in body shame in individuals with a genetic susceptibility. Finally, the study sought to explore possible predictors for weight gain and weight loss.

5.2 Method

5.2.1 Participants

A total of 411 obese individuals were included in the study (see Appendix B.1). We randomly selected these individuals from a larger sample of obese individuals who were encouraged by their general practicioners (GPs) to participate. Inclusion criteria were a BMI of at least 30, the ability to speak and read German, and a minimum age of 18. One hundred sixteen participants living further away from the study center (> 200 miles) served as the control group. The cutoff of 200 miles was chosen due to economic reasons. We randomly assigned the remaining 295 participants to one of two consultations, either with or without genetic information. The three groups (two intervention plus one control group) were also divided into subgroups depending on the individuals' family history of obesity (at least one obese parent/sibling), that is one subgroup with and one without a familial predisposition. After the 6-month follow-up, 253 participants from the intervention groups and 98 from the control group had complete data sets and, therefore, remained for the final analysis (see bottom of Appendix B.1).

5.2.2 Procedure

The study was approved by the Ethics Committee of the Medical School of Marburg, Germany. We recruited obese individuals mostly from the practices of GPs, but also through billboards and newspaper advertisements. All individuals received €10 (~$15 US) for the initial participation which included a short questionnaire, the measurement of height and weight, and a blood test. Individuals were informed that the study was seeking to determine risk factors of obesity, and that a subgroup would be invited to take part in a consultation that provided helpful management strategies for obesity. As the present study was part of a larger study on genetic screenings, all participants gave written informed consent concerning a blood test. For the two intervention groups, randomization was based on a list prepared by the principal investigator who was independent of the consultation procedure (WR); the sequence was generated by a random-number table. The participants of the intervention

groups were assessed through an obesity-specific interview and a selection of questionnaires before the consultation (Time 1 [T1]), immediately after the consultation, and 6 months later (Time 2 [T2]). At the 6-month follow-up, participants were assessed via telephone interviews and mailed surveys. If participants did not respond, three further attempts were made to motivate or assist. The control group (n = 116) did not receive consultation but was assessed at T1 and T2.

5.2.3 Measures

At baseline, body weight and height were assessed by a medical staff either in a general practice or the university laboratory. The weight at T2 was assessed via telephone. In addition to demographics, we queried participants about their family history of obesity by using Stunkard's standard silhouettes (Stunkard, Sörensen, & Schulsinger, 1983) to rate the body shape of parents and siblings. Bulik et al. (2001) report good reliability and validity of this instrument.

Attitudes about losing weight were assessed with a set of interview questions. The aim was to assess alterations of weight loss expectations. We considered 5% weight loss to be a reasonable weight loss goal because it has shown to be associated with improving health (Wadden & Frey, 1997). At the beginning, participants were asked if they intended to lose weight in the future (Yes/No). To assess the perceived likelihood of being able to lose 5% of body weight, we employed a single item ("How would you estimate the likelihood of being able to lose 5% of your current body weight in the next 6 months, which is in your case XY kg?"; *0% to 100%*). Furthermore, we assessed the satisfaction with a weight loss of 5% with a single item ("How satisfied would you be with a weight loss of 5%?"; 0 = *not at all*; 1 = *a little*; 2 = *somewhat*; 3 = *very much*).

Self-blame concerning eating was assessed by the Shame and Guilt concerning Eating Scale (SG) by Frank (1990) which comprises four items to assess guilt and shame concerning normal eating and overeating (e.g., "When I overeat, I feel that I am doing something wrong"; 0 = *never* to 4 = *always*).

Coping behavior was assessed with the Coping Strategies Inventory – Short Form (CSI-S; Tobin et al., 1989). This is a 32-item self-report questionnaire designed to assess coping thoughts and behavior in response to a specific

stressor. It has eight subscales: problem solving, cognitive restructuring, express emotions, social contacts, problem avoidance, wishful thinking, self-criticism, and social withdrawal. In the present study, we used two higher-order subscales named engagement coping (subscales 1 to 4) and disengagement coping (subscales 5 to 8). We altered the instructions by asking participants to describe a typical event or situation that occurred in the past 6 months that made them aware of their obesity. In the CSI manual, Tobin (2001) noted that users have the option of requesting a particular type of stressor. Then, respondents were asked to indicate for each item on a 5-point scale (0 = *never*; 1 = *rarely*; 2 = *sometimes*; 3 = *often*; 4 = *always*) how often they performed a particular coping response in dealing with the previously described typical situation. In our sample, the two higher-order subscales were not significantly correlated, $r = -.07$, $p > .18$. Analyses of the factorial structure of the CSI-S (translated into German) with altered instructions confirmed the results of Tobin (1989). The data are available from the first author.

Body shame associated with obesity was assessed by the shame subscale of the Weight- and Body-Related Shame and Guilt Scale (Conradt et al., 2007). A 6-item subscale assesses the frequency of experiencing shame concerning body and weight in front of real and imagined others (WEB-Shame). The 5-point scale ranged from 0 (*never*) to 4 (*always*).

5.2.4 Consultation

The general consultation (G) without genetic information lasted 30 min and included general information on the following topics: body weight, the failure of most dietary approaches, the role of self-blame and the encouragement to not feel guilty about being obese, reasonable weight loss goals, encouragement of normal and regular food intake, as well as regular exercise. It was emphasized that weight change is only possible in a limited range. The consultation with genetic information (GG) included the same content, plus specific information on heredity, twin studies, and genetic transmission. If patients showed a family history of obesity, this was integrated into the consultation with personal feedback about the genetic susceptibility. Due to the additional information, the consultation with genetic information lasted

about 10 to 15 min longer. Participants from both consultation groups received written material summarizing the main messages. Both consultations were standardized (19- vs. 28-page manuscript; see Appendix A7 and A8). All interventions were provided by six trained consultants (three medical doctors, three clinical psychologists) performing a similar number of both consultations. Treatment fidelity was evaluated by video feedback of each trainer in test consultations.

5.2.5 Statistical Analyses

The targeted sample size (n = 300) was chosen to detect small effects (η^2 = .02) with an alpha level of < .05 and a statistical power of $1-\beta > .90$. We employed a 3 x 2 x 2 repeated measure design: factor Group - control group/general consultation/genetic consultation (C vs. G vs. GG); factor Predisposition - no familial/familial predisposition (NFP vs. FP); factor Assessment Time – before consultation/6-month follow-up (T1 vs. T2). For the single-item questions, we performed Kruskal-Wallis tests to identify significant differences between item ratings (T2 - T1). For the rest of the measures, we performed repeated measure ANOVAs. Even though self-blame about eating and body shame were not normally distributed according to Kolmogorov-Smirnov tests, skewness and kurtosis were in an acceptable range (see Table 5.2). Also, parametric tests proved to be very robust concerning the violation of normality assumption (Rasch & Guiard, 2004), and the Kolmogorov-Smirnov test is considered extremely conservative (Micceri, 1989). Subsequently, to compare mean scores of the six subgroups at T1, we performed one-way ANOVAs and Kruskal-Wallis tests, respectively. Finally, we divided the sample into weight gainers (5% ≤ weight change; $n = 29$), weight maintainers (–5% < weight change < 5%; $n = 261$), and individuals who lost weight (weight change ≤ –5%; $n = 61$) to compare study measures at baseline. The cutoff of 5% was chosen as it has been shown to be associated with health improvements (Wadden & Frey, 1997). The main aim of this trial was not weight loss but psychological adjustment to obesity and improvement of health; therefore, a 5% weight loss seemed appropriate. Alpha level was adjusted for the hypotheses that tested the positive effects of the consultation

(minimizing Type I error). For hypotheses testing the negative effects, an unadjusted alpha level of .05 minimized the likelihood of Type II errors. Data were analyzed by using SPSS (Version 12.0).

5.3 Results

5.3.1 Descriptive Data

We found no significant differences in mean age, sex, BMI, living status, educational levels, or the percentage of individuals reporting to have at least one obese parent/sibling between the three study groups (see Table 5.1). Participants had a mean age of 45.5 years (*SD* = 12.9) and a mean BMI of 35.7 (*SD* = 5.3). The majority were female (70.7%) and reported at least one parent/sibling being obese according to Stunkard's standard silhouettes (56.4%). A total of 335 individuals indicated in the initial interview that they wanted to lose weight in the future (95.4%). The mean number of years of being obese was 21.9 (*SD* = 13.1). Table 5.2 gives an overview of the means, standard deviations, distribution indexes, alpha coefficients, and correlations between BMI and the study measures at baseline. All scales proved to have adequate sample variance and good to excellent internal consistency (.75 to .92). We found a significant but small correlation between BMI and body shame.

5.3.2 Differences in Measure Scores Between Groups at Baseline

Among all the study measures, only the perceived likelihood of being able to lose 5% of body weight differed significantly between study groups at baseline, $\chi^2(5) = 20.97$, $p < .01$. The control group without a familial predisposition (NFP/C) reported a lower likelihood than all other study groups (see Table 5.3). The only explanation we found was that the control group without predisposition consisted of 68.9% individuals from an eastern urban area (Berlin), whereas the predisposed control group only consisted of 50.9%. Individuals from that area rated the likelihood to lose 5% lower than participants from other urban or suburban areas in western Germany which might be due to cultural differences, $\chi^2(2) = 10.74$, $p < .01$.

5.3.3 Interaction Effects of the Factors Group, Predisposition, and Assessment Time

According to the nonparametric tests, the two intervention groups significantly lowered their estimated likelihood of losing 5% of their body weight over time, whereas the control group did not, $\chi^2(2) = 13{,}45$, $p < .005$ (see Table 5.3). Also, the intervention groups, compared to the control group, indicated to be more satisfied with a 5% weight loss at follow-up, although the effect was not significant after adjustment for Type I error inflation, $\chi^2(2) = 7.42$, *ns, p* = .024.

With respect to self-blame about eating, the results confirmed our hypothesis: The group with a familial predisposition which received genetic consultation (FP/GG) indicated a decrease in self-blame, whereas the intervention group without a familial predisposition (NFP/GG) experienced an increase in self-blame about eating. Interestingly, the group with a familial predisposition which received the general consultation (FP/G) experienced the greatest decrease in self-blame about eating, whereas the group without a familial predisposition (NFP/G), once more, experienced an increase in self-blame.

5.3.4 Differences Between Weight Change Groups at Baseline

Neither the general nor the genetic consultation had a significant main effect on weight change. For that reason, we divided the sample into weight gainers ($n = 29$), weight maintainers ($n = 261$), and individuals who managed to lose at least 5% of their body weight ($n = 61$). At baseline, the weight change groups did not differ significantly in sex, BMI, living with a partner, educational levels, mean years of being obese, or the percentage of individuals reporting to have at least one obese parent/sibling. The groups only differed significantly in age, $F(2, 348) = 3.97$, $p < .05$ ($M_{Gain} = 40.0$, $M_{Maintain} = 46.5$, $M_{Loss} = 43.9$). Results showed significant differences between groups at baseline concerning the variables satisfaction with 5% weight loss, disengagement coping, and body shame (see Table 5.4). Post-hoc tests (Tukey-HSD) indicated that the group of weight gainers had significantly higher means at baseline on body shame and disengagement coping compared to weight maintainers and the weight loss group. Regarding the variables satisfaction with a 5% weight loss,

the group of weight gainers reported the lowest mean compared to weight maintainers and the weight loss group.

5.4 Discussion

This study investigated the effects of a consultation focusing on genetic information about obesity on weight-related attitudes, self-blame about eating, and weight-related coping in a sample of obese individuals. The results did not confirm the hypothesis of previous studies (Codori et al., 1997; Frosch et al., 2005; Lerman et al., 1997) that genetic feedback about personal susceptibility may be distressing or demoralizing for individuals with a genetic predisposition: Regarding body shame, there was no significant increase, and neither disengagement nor engagement coping changed significantly at follow-up. Therefore, this analysis of weight-related variables confirmed the results of Rief et al. (2007) that a genetic consultation using risk feedback may not be harmful to obese individuals.

The results supported the suggestion of Frosch et al. (2005) that feedback about genetic susceptibility may have positive effects on obese individuals with a family history of being overweight, particularly on the degree of self-blame about eating. This finding is helpful because self-blame about eating seems to be associated with psychological maladjustment and weight relapse (Burk-Braxton, 1996; Frank, 1991). Another hypothesis was that individuals without a familial predisposition receiving a genetic consultation (NFP/GG) experience not only an increase in self-blame but also an increase in engagement coping compared to the control group, neither of which was confirmed by the results, at least not on a significant level. This suggests that the effects of a genetic consultation are moderated by familial predisposition.

Moreover, it is important to note that the effects on individuals' attitudes about weight loss occurred independently of the consultation type or the familial predisposition. Both intervention groups, compared to the control group, showed more realistic weight loss expectations and a greater satisfaction regarding a 5% weight loss at follow-up. Clearly, these changes can be ascribed to the general part of the consultation which emphasized the

failure of dietary approaches, the limited range of long-term weight loss, and realistic weight loss goals.

It was somewhat surprising that predisposed individuals who received a general consultation also experienced a substantial drop in self-blame. This was unexpected because those individuals did not receive feedback about genetic susceptibility. One possible explanation is an interaction effect between the pretreatment assessment, the general consultation, and the familial predisposition: Those individuals (FP/G) might have learned implicitly during recruitment and assessment. For example, participants were informed about the genetic background of the study, agreed to a blood test, and were questioned about the body shapes of their family members. To trigger an adjustment in self-blame, it might have been enough to focus on their own family history of obesity to emphasize the rather chronic character of their being overweight. The interaction effect would explain why the predisposed control group, who went through the same assessment procedure, did not experience a decrease in self-blame. Additional proof for the proposed interaction effect is that the group without a familial predisposition (NFP/G) did not experience a decrease either.

5.4.1 Predictors for Weight Change

The study also explored possible predictors for weight change. The group of individuals who gained at least 5% of their body weight experienced most frequently body shame and showed the highest mean disengagement coping score at baseline. Although not significant after Bonferroni correction, the weight gain group also showed the lowest satisfaction with their weight at baseline and displayed the lowest frequency in employing engaging coping strategies. These results suggest that the more critical obese individuals are about their weight and body at baseline, the higher the risk to increase body weight at follow-up. On the contrary, the weight loss group reported the lowest means regarding disengagement coping, body shame, and self-blame about eating, and the highest mean satisfaction with a 5% weight loss at baseline. This is an important finding which underlines the need for consultation approaches which improve psychological well-being and foster an engaging coping style with weight-related issues. The results confirmed findings of

other studies (Kayman et al., 1990; Myers & Rosen, 1999) and suggest a disengaging, shame-based coping style as a predictor for future weight gain. However, one methodological shortcoming is that we did not control for the effects of the intervention.

5.4.2 Limitations

There are several limitations to this study. First, we recruited obese patients mostly from general practices. The individuals were willing to take part in a study run by the psychological and medical department. Therefore, variance and, consequently, external validity might be limited due to self-selection. However, the experimental design of our study heightens internal validity. Furthermore, the study sample showed no clinically relevant levels of distress about being overweight, and mean values of body shame and self-blame about eating were in a normal range. On the one hand, the latter finding might be a disadvantage for the usefulness of the results in a genuinely clinical context; on the other hand, there might be greater use of the findings in general practice. In addition, results might be different in other countries where the feedback of genetic susceptibility is more or less accepted. Another methodological limitation relates to the use of questionnaires for assessing coping behavior. Questionnaires lead to different results than, for example, momentary reports recorded via a palm-top computer, as retrospective reports of coping are highly distorted by memory effects (Stone et al., 1998). Regarding the measurement of weight change, the assessment of weight at follow-up over the telephone must be considered as a source for unreliable results, although the cutoff of 5% weight change might have been high enough to heighten the validity of the classification in the weight gain/weight loss group. Moreover, this study was not a weight loss trial, and obese individuals were encouraged to accept their being overweight (but encouraged to change eating patterns and physical activity), so understatement of body weight was not expected.

5.4.3 Conclusions

These results might have implications for clinical work. Feedback about genetic susceptibility might have a relieving effect on individuals with a familial predisposition, but it should be combined with a general consultation which focuses on healthy approaches to weight management and the possibility of reducing weight. There is a fine line between eliciting relieving and motivating responses in obese individuals and nurturing a sense of fatalism and hopelessness. For example, in the study of Frosch et al. (2005), the rather small alteration of feedback from average to increased risk of becoming obese yielded opposing effects in the genetic test group. It may be crucial to inform individuals about the genetic origin of being obese before the general consultation about weight control. Future studies should investigate the effects of giving the information in reverse order (genetic-general vs. general-genetic). Furthermore, participants of such consultations are mostly layman and not statisticians. A potential danger of genetic consultations might be the tendency to falsely interpret a genetic cause as immutable (e.g., "50% to 90% of my overweight is genetically determined"). For example, whilst Maes et al. (1997) estimated genetic factors' influence on the determination of body weight to be 50% to 90%, the same review reported an estimated mean correlation between the BMI of obese individuals and the BMI of parents/siblings of .23, which is considered to be small. Therefore, a genetic consultation with its associated relieving effects should always include recommendations which pinpoint the possibility of a healthy lifestyle (normal eating patterns, physical activity). The interested reader may be referred to a summary of recommendations in Rief et al. (2007).

5.5 References

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5.6 Tables

Table 5.1

Demographics of the Participants of Control and Experimental Groups

	Control	General consultation	Genetic consultation
	n = 98	*n* = 127	*n* = 126
Female (%)	71.4	64.6	76.2
Mean age (*SD*)	47.2 (12.3)	45.1 (13.1)	44.6 (13.1)
Mean BMI (*SD*)	36.7 (5.12)	35.4 (5.16)	35.4 (5.41)
Living with partner (%)	73.1	72.0	70.4
Educational level (%)			
low	37.8	27.6	28.5
medium	31.6	44.1	50.0
high	15.3	22.0	15.9
missing	15.3	6.3	5.6
At least one obese parent/ sibling (%)	54.1	52.8	61.9
Mean number of years being obese (*SD*)	21.9 (13.2)	21.4 (13.5)	22.5 (12.5)

Note. $N = 351$. BMI = body mass index.

Table 5.2

Psychometric Properties of the Measures at Time 1

	Item mean (*SD*)	Min/Max	α§	Skewness	Kurtosis	*r*(BMI)†
Likelihood of losing 5% body weight (*n* = 341)	74.7 (30.2)	0/100	-	-	-	.00
Satisfaction with 5% weight loss (*n* = 343)	1.16 (1.05)	0/3	-	-	-	–.09
Self-blame about eating	1.23 (0.81)	0.0/4.0	.75	0.76	0.49	.05
Engagement coping‡	1.80 (0.59)	0.0/3.8	.86	0.14	0.36	.10
Disengagement coping‡	1.58 (0.57)	0.2/3.2	.81	0.12	–0.27	.10
Body shame	1.75 (1.10)	0.0/4.0	.92	0.25	–0.89	.21*

Note. $N = 351$. BMI = body mass index.
§ Cronbach alpha coefficient.
† Pearson correlations with BMI.
‡ Kolmogorov-Smirnov tests indicated normal distribution.
*$p < .01$.

Table 5.3

Means (SD) of Control and Experimental Groups at Time 1, Time 2, and Mean Differences

Measure	Family predisposition of obesity Group	Time 1		Time 2			Test of significance
		M	*SD*	*M*	*SD*	M_{T2-T1}	
Likelihood of losing 5% body weight	No familial predisposition						G: $\chi^2(2) = 13.45$, $p < .005$ G x P: $\chi^2(5) = 14.30$, *ns* ($p = .014$)
	Control	58.67	34.96	60.76	28.55	2.09	
	General	79.40	26.94	62.07	26.06	−17.33[a]	
	General + Genetic	81.85	29.35	64.63	30.11	−17.22[a]	
	Familial predisposition						
	Control	72.56	23.33	67.40	27.63	−5.16	
	General	76.29	30.97	61.18	33.12	−15.11[a]	
	General + Genetic	76.62	30.46	58.97	31.85	−17.65[a]	
Satisfaction with 5% weight loss	No familial predisposition						G: $\chi^2(2) = 7.42$, *ns* ($p = .024$) G x P: $\chi^2(5) = 8.09$, *ns*
	Control	1.31	1.02	1.36	0.86	0.05	
	General	0.98	1.04	1.53	1.04	0.55[b]	
	General + Genetic	1.26	0.99	1.57	1.08	0.31	
	Familial predisposition						
	Control	1.00	1.04	0.91	0.93	-0.09	
	General	1.24	1.13	1.61	1.06	0.37	
	General+Genetic	1.16	1.02	1.42	1.01	0.26	
Self-blame about eating	No familial predisposition						G x T: $F(1, 345) = 0.46$, *ns* P x T: $F(1, 345) = 7.64$, $p < .005$, $\eta^2 = .022$ G x P x T: $F(1, 345) = 0.46$, *ns*
	Control	1.16	0.85	1.26	0.70	0.11	
	General	1.09	0.67	1.19	0.71	0.10	
	General + Genetic	1.13	0.85	1.25	0.85	0.12	
	Familial predisposition						
	Control	1.27	0.91	1.28	0.83	0.01	
	General	1.26	0.84	1.11	0.78	−0.15*	
	General + Genetic	1.41	0.77	1.31	0.78	−0.11	
Engagement coping	No familial predisposition						G x T: $F(1, 345) = 0.11$, *ns* P x T: $F(1, 345) = 0.29$, *ns* G x P x T: $F(1, 345) = 4.46$, *ns*, ($p < .025$)
	Control	1.71	0.44	1.77	0.55	0.06	
	General	1.86	0.66	1.90	0.60	0.04	
	General + Genetic	1.79	0.63	1.98	0.65	0.19*	
	Familial predisposition						
	Control	1.82	0.56	1.91	0.58	0.09	
	General	1.65	0.58	1.81	0.56	0.16*	
	General + Genetic	1.94	0.58	1.90	0.53	−0.04	
Disengagement coping	No familial predisposition						G x T: $F(1, 345) = 0.14$, *ns* P x T: $F(1, 345) = 0.26$, *ns* G x P x T: $F(1, 345) = 0.49$, *ns*
	Control	1.72	0.52	1.64	0.53	−0.08	
	General	1.53	0.54	1.51	0.54	−0.02	
	General + Genetic	1.51	0.66	1.41	0.53	−0.10	
	Familial predisposition						
	Control	1.65	0.49	1.56	0.63	−0.09	
	General	1.57	0.57	1.48	0.59	−0.09	
	General + Genetic	1.55	0.62	1.50	0.53	−0.05	
Body shame	No familial predisposition						G x T: $F(1, 345) = 1.23$, *ns* P x T: $F(1, 345) = 0.08$, *ns* G x P x T: $F(1, 345) = 1.53$, *ns*
	Control	1.90	1.10	1.84	1.05	−0.06	
	General	1.68	0.99	1.66	0.94	−0.02	
	General + Genetic	1.65	1.21	1.58	1.09	−0.07	
	Familial predisposition						
	Control	1.90	1.09	1.70	1.09	−0.20	
	General	1.65	1.15	1.57	1.16	−0.08	
	General + Genetic	1.78	1.07	1.85	1.04	0.07	

Note. n varied from 338 to 346. Bonferroni corrected alpha level: α = .05/10 = .005. T1 = Time 1. T2 = Time 2. G = factor Treatment Group, P = factor Familial Predisposition, G x P = comparison of all group combinations, T = factor Assessment Time Point, G × T = interaction of G and T in ANOVA, P x T = interaction of P and T in ANOVA, G x P x T = interaction of G, P, and T in ANOVA.

**t* test for dependent measures ($p < .05$; comparison level = 0).

[a]Friedman's test for dependent ordinal measures ($p < .001$).

[b]Friedman's test for dependent ordinal measures ($p < .01$).

Table 5.4

Means (SD) of Weight Change Groups at Time 1

	Weight loss	Maintainers	Weight gain	Test of significance
Likelihood of losing 5% body weight	84.2 (22.4)	72.0 (31.5)	74.7 (30.2)	$\chi^2(2) = 7.24$, *ns*
Satisfaction with 5% weight loss	.93 (.99)	1.26 (1.05)	0.79 (0.98)	$\chi^2(2) = 9.12$, $p < .008$
Self-blame about eating	1.21 (0.73)	1.20 (0.83)	1.62 (0.75)	$F(2, 348) = 3.81$, *ns*
Engagement coping	1.92 (0.71)	1.81 (0.55)	1.53 (0.58)	$F(2, 348) = 4.34$, *ns*
Disengagement coping	1.66 (0.57)	1.53 (0.56)	1.85 (0.57)[b]	$F(2, 348) = 4.79$, $p < .008$, $\eta^2 = .027$
Body shame	1.75 (1.11)	1.68 (1.06)	2.47 (1.09)[a,b]	$F(2, 348) = 7.00$, $p < .008$, $\eta^2 = .039$

Note. Weight loss = Weight loss group ($n = 61$), weight change ≤ −5%. Maintainers = Weight maintainers ($n = 261$), −5% < weight change < 5%. Weight gain = Weight gainers ($n = 29$), 5% ≤ weight change. Bonferroni corrected alpha level: $\alpha = .05/6 = .0083$.

[a] Significantly different from weight loss group, $p < .05$ (Tukey-HSD).

[b] Significantly different from weight maintainer group, $p < .05$ group (Tukey-HSD).

6 Summary

This doctoral thesis aimed to investigate the associations among weight-related shame, guilt, and coping in obesity. Interventions designed for the treatment of obesity commonly have two main goals: first, to improve psychological well-being, and second, to improve physical well-being and health, mostly through moderate weight loss. Psychological factors proved to have significant influence on the outcome and success of these interventions (Teixeira, Going, Sardinha, & Lohman, 2005), and there might be a psychological mechanism explaining why only a subgroup of the obese population suffers from being overweight. The main hypothesis of this work is that weight-related shame and guilt feelings are psychological factors crucial for both emotional well-being and the success of weight loss attempts. Prior studies found suggestive evidence that this hypothesis might be valid: Obese individuals are likely to experience weight-related shame feelings through the contrast of an overtly visible stigma and the omnipresent thin ideal in society, and stigmatizing experiences were consistently related to psychological distress (Friedman et al., 2005; Myers & Rosen, 1999; Puhl & Brownell, 2003). Weight-related guilt feelings are likely experienced since weight control is still viewed as a matter of willpower by obese (Jeffery et al., 1990; Paxton & Sculthorpe, 1999) as well as nonobese individuals (Brogan & Hevey, 2008; Weiner et al., 1988), but unfortunately most weight loss attempts do not remain successful (Ayyad & Andersen, 2000). Also, weight-related shame and guilt feelings might be a maintaining mechanism for the vicious cycle of dieting, weight loss, and weight regain (Burk-Braxton, 1996; Fletcher, Pine, Woodbridge, & Nash, 2007).

Consequently, the three manuscripts address the following research questions: (1) Are weight-and body-related shame and guilt concerning weight control separate constructs? (2) Are weight-related shame and guilt feelings associated to BMI? (3) Do weight-related shame and guilt feelings have separate behavioral and emotional consequences? (4) Are shame-based or guilt-based coping responses predictive of weight change? (5) Is it possible to

minimize guilt and shame feelings about eating through a counseling approach emphasizing genetic factors in the development of obesity?

The first manuscript (see chapter 3; Conradt et al., 2007) presents the evaluation of the psychometric properties of a new self-report measure of weight- and body-related shame and guilt (WEB-SG) in a sample of 331 obese individuals. The factorial structure of the WEB-SG supported a two-factor conceptualization with the constructs weight- and body-related shame and guilt concerning weight control. Even though the intercorrelation of the subscale scores was rather high ($r = .64$, $p < .01$), the subscales measure different constructs. The WEB-SG subscales proved to be internally consistent ($\alpha_{shame} = .92$; $\alpha_{guilt} = .87$) and temporally stable ($ICC_{shame} = .79$; $ICC_{guilt} = .72$), which means the scores did not fluctuate greatly over a period of 6 months. The construct validity of the subscales was evidenced by a substantial overlap of common variance with other shame and guilt measures. Also, the subscales showed differential correlation patterns to other scales (depressive symptoms, self-esteem, dietary restraint, rumination about overweight), but were not substantially associated to BMI ($r_{Guilt} = .10$, *ns*; $r_{Shame} = .21$, $p < .05$). Thus, it appears that the frequency of weight-related shame and guilt feelings in obese individuals may be affected by factors other than weight. In summary, the WEB-SG is a brief, psychometrically sound measure for assessing body shame and guilt concerning weight control in obese individuals.

The second manuscript (see chapter 4; Conradt et al., 2008) presents the longitudinal associations among weight-related coping, guilt, and shame in a sample of 98 obese individuals. The study explored the kind and frequency of typical coping situations in which obese individuals become aware of being obese. Individuals reported mostly negative evaluations through others/self (37.8%), physical exercise situations (24.5%), or environmental hazards (16.3%; mainly shopping for clothes). The two categories eating difficulties (2.0%) and illness/disease (3.1%) played only a minor role. Again, the perceived distress about those situations did not differ significantly between levels of obesity, but was strongly correlated to weight-related shame ($r = .59$, $p < .001$) and guilt ($r = .53$, $p < .001$). Excessive body weight itself does not appear to be the determinant of distress about weight-related situations, but

cognitive appraisal of the situation. Furthermore, the study sought to determine the predictive utility of weight-related shame and guilt concerning coping responses, and whether there is an association between coping responses and weight change. Contrary to the hypothesis, weight-related shame at baseline was a significant negative predictor for problem-focused engagement coping ($\beta = -.26$, $p < .05$), but not a positive predictor for disengagement coping, whereas, as expected, weight-related guilt was a significant positive predictor for problem-focused engagement strategies ($\beta = .25$, $p < .05$) and dietary restraint ($\beta = .26$, $p < .05$) at follow-up. Finally, weight loss was accompanied by a substantial drop in problem-focused disengagement coping (wishful thinking, problem avoidance), but not an increase in engagement coping strategies. That either could mean that a decrease of disengaging coping responses might support weight loss, or that weight loss causes a decrease in disengaging coping responses.

The study outlined in the third manuscript (see chapter 5; Conradt et al., in press) tested the effects of a consultation using genetic information about obesity on attitudes about weight loss goals, self-blame about eating, and weight-related coping in obese individuals. For that purpose, we chose a longitudinal experimental design with two intervention groups ($n_1 = 126$; $n_2 = 127$) and a control group ($n = 98$). Independent variables were the experimental variation of the consultation (with and without genetic information), the familial predisposition (at least one parent/sibling obese vs. no parent/sibling obese), and two assessment points (after consultation and 6-month follow-up). Individuals with and without a familial predisposition profited in different ways from a consultation using genetic information about obesity: At follow-up, individuals with a familial predisposition reported mainly a relieving effect in the form of less self-blame about eating. Both experimental groups, independent of the factors Consultation and Familial Predisposition, reported an adjustment to more realistic weight loss goals and a greater satisfaction with a 5% weight loss. Neither disengagement nor engagement coping responses changed significantly at follow-up. The hypothesized stigmatizing effect could not be observed either. Regarding weight change, the less satisfied obese individuals felt about their current weight at baseline, the higher the risk that these individuals had gained weight

at follow-up. Also, the weight gain group showed higher levels of body shame and disengagement coping compared to the weight loss and weight maintenance group. In summary, a consultation with genetic information about obesity and feedback of the familial susceptibility seem to be helpful especially for obese individuals with a familial predisposition.

6.1 Research and Practical Recommendations

Weight-related shame and guilt in obesity are factors strongly associated with the individuals' emotional adjustment to obesity and weight management efforts. The first intriguing finding was that BMI was not (substantially) associated with weight-related shame, guilt, or coping. Sarwer, Wadden, and Foster (1998) reported the same finding for BMI and body dissatisfaction which is a closely related construct. This result suggests an independence of weight-related shame and guilt from actual body weight within the obese population (BMI > 30). The question remains whether the independence of BMI and weight-related shame and guilt feelings can be confirmed in other obese samples (e.g., inpatients), and whether the finding is valid for normal and overweight individuals.

Further, the perceived distress about typical weight-related situations did not differ between levels of obesity. Instead, it was strongly correlated to weight-related shame and guilt. Future studies investigating psychological distress in obesity should include self-conscious emotions in the pool of variables since especially weight-related shame might be the link between stigmatization and psychopathology. One hypothesis is that most distressing weight-related situations are simply shameful experiences. Obese individuals named, beside weight reduction efforts, mostly situations like being evaluated by self/others, physical functioning situations, or buying clothes as sources for distress which confirmed findings of another study (Kolotkin, Crosby, Kosloski et al., 2001). The link between self-conscious emotions and experienced distress could be investigated by assessing situational distress and accompanying emotions, for instance via palmtop.

Weight-related shame was also highly associated with indicators of psychopathology like depressive symptoms or low self-esteem, which points to the validity of weight- and body-related shame being a mediator of the obesity-psychopathology link (Becker et al., 2001; Friedman et al., 2005; Herpertz et al., 2006). Since weight-related shame was found to occur almost independently of body weight, the hypothesis regarding the developmental sequence is that the proneness to shame (or to weight-related shame) evolves before individuals become overweight. Longitudinal studies, especially with childhood and adolescent samples, could yield clarification of this research question. Moreover, future studies should investigate the role of weight-related shame in the development of anxiety disorders which were found to be significantly more prevalent in obese compared to nonobese samples (Becker et al., 2001; Herpertz et al., 2006).

Regarding weight loss, results indicated that obese individuals who are ashamed of their weight and less satisfied with smaller weight loss goals are more likely to gain weight in the future. Shame feelings could hinder obese individuals from engaging in weight-maintaining activities like sports. On the other hand, intense feelings like shame might be difficult to cope with. Obese individuals, especially women, are likely to engage in maladaptive strategies like stress-driven eating and drinking which might be a reason for weight gain (Laitinen et al., 2002). Fitting the latter hypothesis, weight loss was accompanied by a decrease in problem-focused disengaging coping responses (problem avoidance, wishful thinking). Again, clarity about the developmental sequence of coping responses and weight change would be helpful for the understanding and treatment of obesity. Either the absence (or decrease) of disengaging coping responses supports weight loss, or weight loss results in less problem avoidance and less wishful thinking since weight loss goals are "on their way", although the latter explanation contradicts the finding that BMI was not associated to disengaging coping or shame feelings. This is an important research question since cognitive behavioral therapy offers effective interventions for diminishing problem avoidance, wishful thinking, or shame-based reactions and fostering healthier ways of coping with obesity-related issues. Finally, dietary restraint was not a predictor for weight change which is

a well known finding of other studies (McGuire, Wing, Klem, Lang, & Hill, 1999; Westenhöfer et al., 2004).

In summary, Figure 6.1 suggests a path model of the variables under investigation. The model could be tested with latent trait analysis. It is noteworthy that weight-related shame feelings and disengaging coping responses are suggested to be positively correlated to weight gain, but not to weight loss. On the contrary, weight loss (not represented in this model) is suggested to be independent from engagement coping, guilt feelings, or dietary restraint. Although BMI is included as a variable, it is hypothesized to be independent from the other variables.

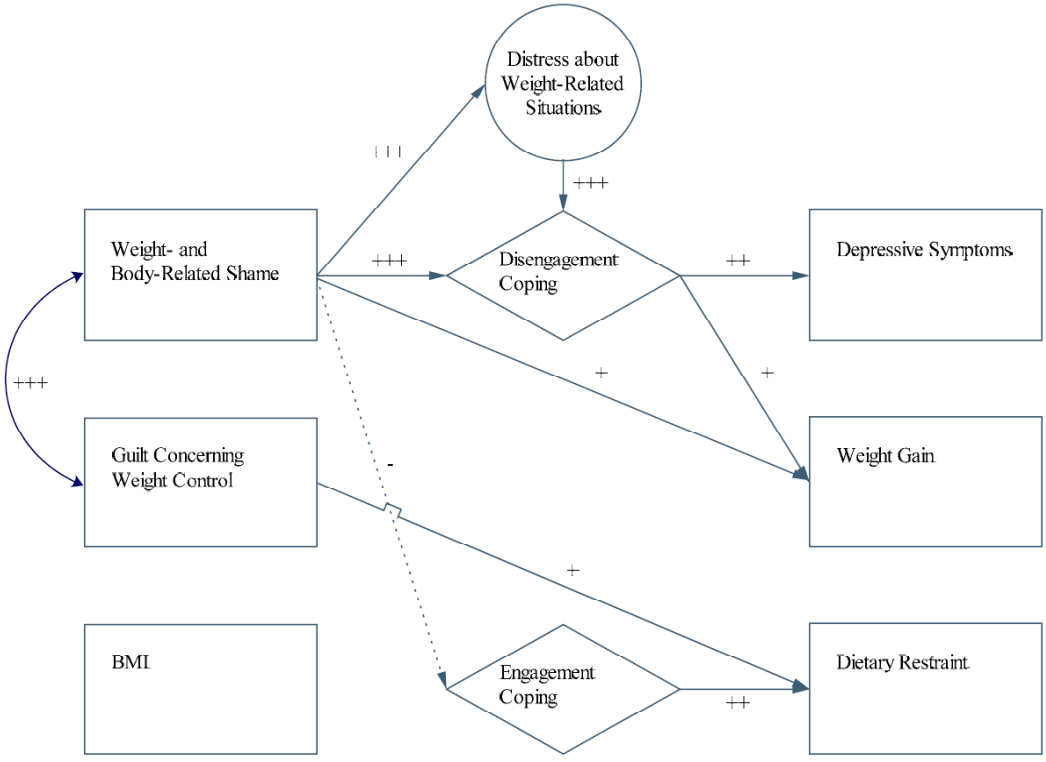

Figure 6.1. Proposed model for associations among study variables.
Note. Continuous line = positive correlation, dashed line = negative correlation. Proposed strength of correlation: [+++] = $r > .50$. [++] = $.30 < r < .50$. [+] = $.20 < r < .30$. [-] = $-.30 < r < -.20$.

The use of genetic information and risk feedback in obesity turned out to be helpful for obese individuals, especially those with a familial predisposition. A

next research step could be the evaluation of a more intense program which is based on a gene-action explanatory model of obesity. The main question is whether the positive psychological effects can be fortified and consolidated over time. Another approach worthwhile to be tested is the combination of such consultation with a weight loss program. In particular, a medium-risk feedback (familial predisposition) might be beneficial in adjusting treatment expectations to a realistic level and decrease guilt feelings about transgressions or failures. In summary, professional weight loss interventions should be accompanied by interventions focusing on coping efforts with weight-related situations, especially those with high shame- or guilt-potential. Nondietary approaches already include these topics in the treatment schedule, and their authors have proven to increase psychological well-being in obese individuals (e.g., Bacon et al., 2002). Furthermore, the differential behavioral and emotional consequences of shame-based or guilt-based reactions could be used effectively in cognitive behavioral therapy. For instance, guilt-based reactions inherit an engaging component, whereas shame-based reactions might be hindering for problem solving efforts and weight change. In the current recommendations for obesity treatment for professionals (North American Association for the Study of Obesity & National Heart Lung and Blood Institute, 2000), the words guilt or shame are not even mentioned, pointing to the fact that the treatment underlies a very technical view which focuses on weight, health risks, exercise, and eating. Distressing situations, which possibly result in strong emotions like shame or guilt, could be powerful in obstructing weight loss strategies. Therefore, the handling of weight-related self-conscious emotions must be implemented in the current treatment recommendations which could result in a stepwise approach in the diagnostic and therapeutic process. Obese individuals who frequently experience intense shame feelings about their weight might benefit more from cognitive behavioral treatment strategies (cognitive restructuring, emotion management etc.) than pure weight management.

Findings of this doctoral thesis suggest some practical recommendations for health professionals who provide consultations for obese individuals. It should be noted that the recommendations given below are limited to the findings and,

therefore, can be embedded in a more extensive program. Further recommendations may be found in Rief et al. (2007).

► Assess frequency of weight-related shame and guilt feelings separately
► Determine most frequent distressing situations which induce weight-related shame or guilt feelings
► Explore behavioral and emotional consequences of distressing situations
► Inform patient about link between weight-related shame, disengaging coping behavior, and depressive symptoms
► Highlight beneficial and pathological consequences of guilt feelings (behavioral change vs. excessive worries or rumination)
► Stress the association between disengaging coping responses (above all self-criticism, problem avoidance, and wishful thinking) and their hindering effect on weight loss
► Suggest healthier ways of coping with obesity-related issues if disengaging coping responses are predominant
► Inform about familial susceptibility for obesity with emphasis on realistic weight loss goals, a lessening of self-blame, and alternative behavioral strategies combined with an optimistic spirit ("weight is difficult to change but not immutable")

6.2 German Summary

Die vorliegende Arbeit hat das Ziel, Zusammenhänge zwischen gewichtsbezogener Scham, Schuld und Coping in einer Stichprobe von adipösen Individuen zu untersuchen. Interventionen, die zur Behandlung der Adipositas entwickelt wurden, haben üblicherweise zwei Hauptziele: erstens die Verbesserung des psychischen Wohlbefindens, und zweitens die Verbesserung der Gesundheit bzw. des körperlichen Wohlbefindens – meist durch moderaten Gewichtsverlust. Psychologische Faktoren haben großen Einfluss auf das Ergebnis bzw. den Erfolg solcher Interventionen (Teixeira et al., 2005), und es existiert vermutlich ein psychologischer Mechanismus, der erklären kann, warum nur eine Untergruppe der adipösen Population unter

ihrem Körpergewicht leidet. Die Haupthypothese dieser Arbeit besagt, dass gewichtsbezogene Scham- und Schuldgefühle psychologische Faktoren darstellen, die zum einen für das emotionale Wohlbefinden, zum anderen für eine erfolgreiche Gewichtsabnahme entscheidend sind. Frühere Studien lieferten Hinweise darauf, dass diese Hypothese gültig sein könnte: Adipöse Individuen erleben häufig Schamgefühle durch das sichtbare Stigma des Körpergewichts und dem überall präsenten Schlankheitsideal. Stigmatisierende Erfahrungen sind durchgängig positiv korreliert mit psychischer Belastung (Friedman et al., 2005; Myers & Rosen, 1999; Puhl & Brownell, 2003). Schuldgefühle werden ebenfalls häufig erlebt, da adipöse (Jeffery et al., 1990; Paxton & Sculthorpe, 1999) wie auch nicht adipöse Individuen (Brogan & Hevey, 2008; Weiner et al., 1988) die Gewichtskontrolle meist als eine Sache der Willensstärke sehen. Scham- und Schuldgefühle könnten ebenfalls ein aufrechterhaltender Faktor im Teufelskreis von restriktivem Essen, rigider Esskontrolle, Gewichtsverlust und erneuter Gewichtszunahme sein (Burk-Braxton, 1996; Fletcher et al., 2007).

Die drei in dieser Arbeit vorgestellten Manuskripte thematisieren die folgenden Fragestellungen: (1) Sind gewichtsbezogene Scham und gewichtsbezogene Schuld als eigenständige Konstrukte messbar? (2) Falls ja, weisen gewichtsbezogene Scham und Schuld unterschiedliche behaviorale und emotionale Korrelate auf? (3) Sind gewichtsbezogene Scham- und Schuldgefühle Prädiktoren für eine Veränderung des Körpergewichts (Zunahme oder Abnahme)? (4) Lassen sich gewichtsbezogene Schuldgefühle durch eine Beratung minimieren, in welcher genetische Komponenten bei der Entstehung der Adipositas betont werden?

Das erste Manuskript (siehe Kapitel 3; Conradt et al., 2007) beschreibt die Validierung einer Skala zur Messung von gewichtsbezogener Scham und Schuld (WEB-SG) in einer Stichprobe von 331 adipösen Individuen. Exploratorische und konfirmatorische Faktoranalysen bestätigten ein Zweifaktorenmodell mit den Konstrukten „Gewichts- und körperbezogene Scham“ und „Schuld bezüglich der Gewichtskontrolle“. Wenngleich die Summenwerte der Unterskalen recht hoch interkorrelierten ($r = .64$, $p < .01$), ist dennoch von einer Messung unterschiedlicher Konstrukte auszugehen. Die

Unterskalen der WEB-SG erwiesen sich als intern konsistent (α_{shame} = .92; α_{guilt} = .87) und reliabel (ICC_{shame} = .79; ICC_{guilt} = .72), dass heißt, es zeigte sich nur eine geringe Fluktuation der Summenwerte über einen Zeitraum von sechs Monaten. Die Konstruktvalidität der Unterskalen wurde durch substanzielle Überschneidungen gemeinsamer Varianz mit anderen Schuld- und Schamskalen nachgewiesen. Weiterhin zeigten die Unterskalen unterschiedliche Korrelationsmuster zu anderen Skalen (depressive Symptome, Selbstwert, restriktives Essen, gewichtsbezogene Rumination), allerdings waren sie nicht substanziell mit der Variable BMI assoziiert (r_{Guilt} = .10, *ns*; r_{Shame} = .21, $p < .05$). Scheinbar ist die erlebte Häufigkeit von gewichtsbezogenen Scham- und Schuldgefühlen von anderen Faktoren beeinflusst als dem Körpergewicht. Zusammenfassend ist die WEB-SG ein kurzes, psychometrisch valides Messinstrument zur Erfassung körper- und gewichtsbezogenen Scham- und Schuldgefühle bei adipösen Personen.

Das zweite Manuskript (siehe Kapitel 4; Conradt et al., 2008) thematisiert die längsschnittlichen Zusammenhänge zwischen gewichtsbezogenem Coping, Schuld- und Schamgefühlen in einer Stichprobe von 98 adipösen Personen in einem Zeitraum von sechs Monaten. Ziel der Studie war die Exploration sowohl der Art als auch Häufigkeit typischer Belastungssituationen adipöser Individuen, in denen sie sich ihrer Adipositas bewusst werden. Die am häufigsten genannten Belastungssituationen waren den Kategorien ‘negative Bewertung durch die eigene Person oder durch andere’ (37.8%), ‘körperliche Bewegung’ (24.5%), oder ‘umweltspezifische Probleme’ (16.8%; Kauf von Bekleidung) zuordenbar. Die beiden Kategorien ‘Schwierigkeiten mit dem Essen’ (2.0%) und ‘Krankheit’ (3.1%) spielten hingegen nur eine untergeordnete Rolle. Überdies war der für jede Situation eingeschätzte Belastungsgrad statistisch unabhängig vom BMI, allerdings signifikant positiv korreliert mit gewichtsbezogenen Scham- (r = .59, $p < .001$) und Schuldgefühlen (r = .53, $p < .001$). Starkes Übergewicht per se scheint demzufolge nicht den Belastungsgrad durch gewichtsbezogene Situationen zu determinieren, wohl aber die kognitiv-emotionale Bewertung der Situationen. Weiteres Ziel der Studie war die Bestimmung der prädiktiven Validität gewichtsbezogener Scham- und Schuldgefühle in Hinblick auf eingesetzte

Copingstrategien. Zugleich sollte die Frage beantwortet werden, ob ein Zusammenhang zwischen Copingstrategien und einer eventuellen Gewichtsänderung besteht. Entgegen der formulierten Hypothese waren gewichtsbezogene Schamgefühle ein signifikant negativer Prädiktor für problemfokussiertes Engagementcoping ($\beta = -.26$, $p < .05$), allerdings kein signifikant positiver Prädiktor für Disengagementcoping. Gewichtsbezogene Schuldgefühle waren, wie erwartet, ein signifikant positiver Prädiktor für problemfokussiertes Engagementcoping ($\beta = .25$, $p < .05$) sowie für gezügeltes Essverhalten ($\beta = .26$, $p < .05$). Schließlich war bei der Gruppe adipöser Personen, die einen Gewichtsverlust über die sechs Monate erlebten, eine signifikante Reduktion in Hinblick auf problemfokussiertes Disengagementcoping (Problemvermeidung, Wunschdenken) zu beobachten, allerdings keine Zunahme bezüglich der Variable Engagementcoping. Letztgenanntes Ergebnis könnte bedeuten, dass eine Verringerung von Disengagementcoping-Strategien einen Gewichtsverlust unterstützt, oder dass ein Gewichtsverlust eine Verringerung eben dieser Copingstrategien nach sich zieht.

Die Studie, die im dritten Manuskript vorgestellt ist (siehe Kapitel 5; Conradt et al., in press), untersuchte die Fragestellung, ob eine Adipositasberatung, die genetische Informationen über die Erkrankung beinhaltet, zu einer Veränderung gewichtsbezogener Einstellungen (beispielsweise in Hinblick auf das individuelle Wunschgewicht) sowie gewichtsbezogener Schuldgefühle und Copingstrategien führt. Zu diesem Zweck wurde ein Längsschnittstudiendesign gewählt, bei welchem zwei Interventionsgruppen ($n_1 = 126$; $n_2 = 127$) und eine Kontrollgruppe ($n = 98$) untersucht wurden. Unabhängige Variablen waren die experimentelle Variation der Beratung (mit genetischer Information vs. ohne), die vorhandene familiäre Prädisposition (mindestens ein Elternteil oder Geschwister adipös vs. kein Elternteil oder Geschwister adipös) und zwei Messzeitpunkte (vor Beratung vs. sechs Monate später). Personen mit und ohne familiärer Prädisposition profitierten in unterschiedlichem Maß von der Beratung mit genetischen Informationen: Nach sechs Monaten berichteten Personen mit einer familiären Prädisposition hauptsächlich Erleichterung im Sinne einer Abnahme von Schuld- und Schamgefühlen über das Essverhalten. Beide

Experimentalgruppen (unabhänging von Art der Beratung und Prädisposition) berichteten eine signifikante Veränderung hinzu realistischeren Gewichtsabnahmezielen sowie eine größere Zufriedenheit mit einer 5%igen Gewichtsabnahme. Weder die Variable Disengagement- noch Engagementcoping veränderten sich signifikant nach sechs Monaten. Ein eventuell stigmatisierender Effekt der genetischen Beratung konnte ebenfalls nicht beobachtet werden. Bezüglich der Variable Gewichtsveränderung war das Risiko einer Gewichtszunahme bei Follow-up umso größer, je unzufriedener adipöse Personen mit ihrem aktuellen Gewicht vor der Beratung gewesen waren. Überdies zeigte die Gruppe der Personen, die innerhalb der sechs Monate eine Gewichtszunahme erlebten, vor der Beratung signifikant höhere Summenscores auf den Variablen gewichtsbezogene Scham und Disengagementcoping im Vergleich zu den Personen, die ihr Gewicht halten oder sogar reduzieren konnten. Zusammenfassend scheint eine Beratung, die genetische Informationen über Adipositas beinhaltet, hilfreich zu sein, vor allem für Personen mit einer familiären Prädisposition.

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Appendix

A.1 Timing of Assessment

	Two weeks before consultation	Before consultation (Time 1)	6 months after consultation (Time 2)
Information and consent form	X		
Sociodemographic questionnaire	X		
Medical report	X		
Assessment of familial predisposition	X		
Questionnaires		X	X
Obesity interview		X	X

A.2 Information and Consent Forms

Projektleitung: „Evaluation einer Beratung zu genetischen Aspekten bei Adipositas“

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Bundesministerium für Bildung und Forschung

Studie zum Übergewicht

Sehr geehrte Studieninteressentin, sehr geehrter Studieninteressent,

wir möchten Sie bitten, an der nachfolgend näher beschriebenen Untersuchung teilzunehmen. Von der Philipps-Universität Marburg wird eine Studie durchgeführt, um mehr Aufschluss über Ursachen und Behandlungsmöglichkeiten von Übergewicht zu erhalten. Sie können durch Ihre Teilnahme an dieser Studie dazu beitragen, dass mehr Erkenntnisse über das Problem Übergewicht gewonnen werden, unter dem viele Menschen leiden.

Bei dieser Untersuchung wird Ihnen eine Blutprobe abgenommen, aus der Analysen möglicher Genvarianten, die die Ausbildung von Übergewicht begünstigen, vorgenommen werden. Als erstes soll mittels einer Analyse der Erbsubstanz (DNS) geprüft werden, ob Mutationen im sogenannten Melanokortin-4-Rezeptorgen vorliegen; diese findet man bei ca. 3% aller Menschen mit starkem Übergewicht.

Etwa jeder vierte Teilnehmer erhält ca. 2-3 Wochen nach der Blutabnahme eine Beratung über sinnvolles Ernährungs- und Bewegungsverhalten und wird 6 Monate später durch ein Gespräch und Fragebögen nochmals über seinen allgemeinen Gesundheitszustand befragt. Bei der Beratung erhalten die Teilnehmer nach dem Zufallsprinzip eine von 2 verschiedenen Aufklärungsgespräche, die beide als hilfreich anzusehen sind.

Was haben Sie davon? Alle Teilnehmer erhalten als kleine Aufwandsentschädigung **10 €** für die Bereitschaft zur Blutabnahme bzw. **25 €**, falls Sie für die nachfolgende Beratung ausgewählt werden (die nachfolgende Beratung wird ca. 1 ½ Stunden dauern). Auf Wunsch erhalten Sie zum Abschluss der Studie eine Informationsbroschüre zu Erkenntnissen zum Übergewicht.

Welche Nachteile könnten Ihnen durch die Studienteilnahme entstehen? Medizinisch sind außer der Blutabnahme keine Eingriffe mit dieser Studie verbunden. Einziger uns bislang vorstellbarer Nachteil könnte sein, dass Sie bei einem zukünftigen Neuabschluss von privaten Krankenversicherungen oder Lebensversicherungen genetische Risiken angeben müssten, falls solche eindeutig bei Ihnen festgestellt würden und Sie darüber informiert worden wären. Diese eindeutigen genetischen Risiken können zur Zeit bei ca. 3% der Übergewichtigen gefunden werden.

Wir verpflichten uns, die Regeln des Datenschutzes (Bundesdatenschutzgesetz § 40) und der Schweigepflicht voll einzuhalten. Eine EDV-Abspeicherung der Daten erfolgt ausschließlich anonymisiert. Fragebögen und sonstige Angaben werden aus wissenschaftlichen Gründen 10 Jahre aufbewahrt und dann vernichtet. Auch die Blutproben werden 10 Jahre für mögliche weitere molekulargenetische Analysen aufbewahrt, die im direkten Zusammenhang zur Gewichtsregulation stehen. Sollte nach 10 Jahren noch DNS vorhanden sein, so wird jegliche Zuordnung zu Ihrer Person durch das Löschen der Schlüsselliste verunmöglicht.

Projektleitung: „Evaluation einer Beratung zu genetischen Aspekten bei Adipositas“

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Die Teilnahme an der Studie ist freiwillig. Sie haben jederzeit die Möglichkeit, Ihre Studienteilnahme ohne Angabe von Gründen zu widerrufen, ohne dass Ihnen daraus Nachteile entstehen. Von diesem Informationsschreiben verbleibt ein Exemplar bei Ihnen, ein unterschriebenes Exemplar werden wir unseren Unterlagen hinzufügen.

Über Ihre Bereitschaft zur Studienteilnahme würden wir uns sehr freuen.

Im Namen der Studienleiter verbleibe ich mit freundlichen Grüßen

Prof. Dr. W. Rief
Projektleiter

Zutreffendes bitte ankreuzen:

	Ja	Nein
Ich möchte informiert werden, falls bei mir Veränderungen in der Erbanlage des Melanokortin-4-Rezeptorgens vorliegen. Ich bin damit einverstanden, wenn diese Informationen studienbedingt entweder in ca. 2-3 Wochen oder erst in 6 Monaten mitgeteilt werden.		
Ich möchte auch in Zukunft (bis maximal 2012) informiert werden, falls in meiner Erbsubstanz (DNS) andere Genvarianten entdeckt werden, die einen Einfluss auf das Zustandekommen von Übergewicht haben.		

Ich wurde ausreichend mündlich und schriftlich über diese Studie informiert. Ich bin bereit, zu den oben beschriebenen Bedingungen an der Studie teilzunehmen.

Name:_____ Vorname:_____

Adresse:_____

Telefon:_____

Ort & Datum:_____ Unterschrift:_____

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Bundesministerium für Bildung und Forschung

Studie zum Übergewicht

Sehr geehrte Frau D.,

vielen Dank für Ihre Teilnahme an unserem Studienprojekt zum Thema Übergewicht. Beiliegend erhalten Sie ein Fragebogenpaket, das Sie bitte vollständig zu Hause ausfüllen und zum vereinbarten Beratungstermin mitbringen. Ich bitte Sie, die Fragebogen spontan auszufüllen, also nicht allzu lange nachzudenken. Falls Sie Schwierigkeiten beim Ausfüllen haben sollten, bitte ich Sie die Stelle zu markieren. Wir werden diese dann gemeinsam bei Ihrem Besuch besprechen.

Bitte kommen Sie am Montag, den 26. Januar
um 10.00 Uhr
in die Gutenbergstr. 18
EG, Raum Nr. 10.

Falls Sie unerwartet nicht teilnehmen können, teilen Sie mir dies bitte unter folgender Nummer mit: **06421-282-3697.**

Mit freundlichen Grüßen

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Evaluation einer Beratung bei Adipositas unter Berücksichtigung genetischer Aspekte

Liebe Kollegin, lieber Kollege,

an der Philipps-Universität Marburg wird aktuell ein Forschungsprojekt zur Adipositas durchgeführt, in dem neben molekulargenetischen Untersuchungen ein Teil der übergewichtigen Personen auch eine Beratung zum Ernährungs- und Bewegungsverhalten erhält. Wir bieten Ihnen die Möglichkeit zu einer Kooperation.

Kooperationsmöglichkeiten:

- Bereitschaft, adipöse Patienten **(BMI > 30, Alter > 18 Jahre)** Ihrer Praxis über dieses Projekt zu informieren und eine Blutprobe der Patienten an das Forschungslabor der Kinder- und Jugendpsychiatrie zu schicken.
- Soweit räumlich möglich können wir von Ihnen ausgewählte Patienten in Ihrer Praxis beraten (zeitlicher Aufwand 2 Stunden).
- Mit der Teilnahme gehen Sie keinerlei Verpflichtung ein und können diese jederzeit beenden.

Aufwandsentschädigung für Ihre Kooperation

- Finanzielle Entschädigung Ihres persönlichen Aufwands (geschätzt ca. 5-10 Minuten) mit 20 € pro Patient.
- Bei Wunsch erhalten Sie Informationen zur Nahrungs- und Gewichtsregulation nach den heutigen Erkenntnissen der Molekulargenetik im Bereich Adipositas.
- Bei Wunsch informieren wir Sie über evaluierte Therapiemöglichkeiten bei Adipositas und deren Erfolgsaussichten am Ende des Projektes.

Aufwandsentschädigung für Ihre Patienten

- Für die Bereitschaft, eine Blutprobe einzusenden, erhalten Ihre Patienten je 10 €.
- Für das Ausfüllen der Fragebögen in Zusammenhang mit dem Beratungsgespräch erhält die Patientin/ der Patient weitere 15 € (randomisierte Stichprobe).

Für weitergehende Fragen zum Projekt stehen wir Ihnen gerne zur Verfügung.
Eine Zuweisung interessierter Patienten direkt an uns wäre ebenfalls hilfreich.
Soweit wir nichts Gegenteiliges hören, erlauben wir uns, in den nächsten Tagen bei Ihnen nachzufragen, ob Interesse an einer Zusammenarbeit besteht.

Bis dahin verbleiben wir mit freundlichen Grüßen

Prof. Dr. W. Rief

A.3 Sociodemographic Questionnaire, Medical Report, and Assessment of Familial Predisposition

Kode:

Datum:

Angaben zur Person

Name	Vorname:	
Geburtsdatum	Geschlecht: ○ weiblich	○ männlich
Anschrift	Strasse:	
	PLZ:	Ort:
Telefon		
Email		

Wann kann man Sie telefonisch erreichen?

Nationalität	○ deutsch	○ andere:
Familie	○ alleine lebend	○ in fester Partnerschaft
Kinder	Anzahl:	Davon adoptiert:
		Im eigenen Haushalt lebend:
Schulbildung	○ Gehe noch zur Schule	
	○ Hauptschule	oder vergleichbares
	○ Realschule	oder vergleichbares
	○ Gymnasium	oder vergleichbares
	○ sonstiges:	
Beruf	Höchster Abschluss:	
	Derzeitige Tätigkeit:	
Körper	Gewicht (kg):	
	Größe (cm):	

Sind Sie derzeit in medizinischer Behandlung wegen des Übergewichts?

○ Ja ○ Nein Wenn Ja, wo:

Vielen Dank!

Körperlicher Befund

Körpergröße ..... cm
Körpergewicht ..... kg

BMI ..... kg/(m)²

Fettverteilung
Waist-to-hip ratio

Taillenumfang (Risiko w > 80/88 cm, m > 94/102 cm)

(zwischen Rippenbogen und Beckenkamm) ..... cm

Hüftumfang

(Höhe des Trochanter major) ..... cm

Quotient _____

(gynoid vs. abdominal = w > 0,85, m > 1,0)

Adipositas assoziierte Erkrankungen / körperliche Beschwerden

Erhöhter Blutdruck	ja	nein	.../... mmHg
Diabetes mellitus Typ 2	ja	nein	
Erhöhte Blutfettwerte	ja	nein	
Gelenkbeschwerden	ja	nein	
Herz-Kreislauf-Erkrankungen	ja	nein	
Luftnot in Ruhe	ja	nein	
bei Belastung	ja	nein	

Ergebnisse Blutuntersuchung

MC4R-Mutationen ja nein

Dürfen wir Sie bei neuen Fragestellungen (neben der eigentlichen Beratung) kontaktieren?

ja nein

Familienstammbaum
Bitte schätzen Sie die Körperform Ihrer Angehörigen ein und tragen Sie die entsprechende Nummer für jeden Verwandten in die linke Spalte ein.

Codierung:_____

Datum:_____

Leiblicher Vater:

Leibliche Mutter:

Bruder/Schwester*:

Bruder/Schwester*:

Bruder/Schwester*:

Bruder/Schwester*:

*Richtiges bitte unterstreichen

Vielen Dank!

A.4 Questionnaires (Time 1 and Time 2)

Bundesministerium für Bildung und Forschung

Kode:_____

Datum:_____

Liebe Studienteilnehmerin, lieber Studienteilnehmer,

Wir freuen uns, Sie zur Teilnahme an unserer Studie begrüßen zu dürfen.
Ziel der Studie ist es, neue Zusammenhänge in der Entstehung von Übergewicht zu vermitteln und Behandlungsansätze für Betroffene zu entwerfen.

Bitte beantworten Sie alle Fragen so, wie es für Sie persönlich zutreffend ist.
Es gibt keine „richtigen" oder „falschen" Antworten.
Geben Sie pro Frage bitte nur eine Antwort.
Bitte beantworten Sie alle Fragen und lassen Sie keine aus.

Meine Mitarbeiter und ich danken Ihnen herzlich für Ihre Mitarbeit.

Mit freundlichen Grüßen

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[Center for Epidemiological Studies Depression Scale Shortform – CES-D]

Bitte kreuzen Sie bei den folgenden Aussagen die Antwort an, die Ihrem Befinden während der letzten Woche am besten entspricht/ entsprochen hat.

Antworten:	0	selten oder überhaupt nicht	(weniger als 1 Tag)
	1	manchmal	(1 bis 2 Tage lang)
	2	öfters	(3 bis 4 Tage lang)
	3	meistens, die ganze Zeit	(5 bis 7 Tage lang)

Während der letzten Woche ...	selten	manchmal	öfters	meistens
1 ... haben mich Dinge beunruhigt, die mir sonst nichts ausmachen.	0	1	2	3
2 ... konnte ich meine trübsinnige Laune nicht loswerden, obwohl mich meine Freunde/Familie versuchten, aufzumuntern.	0	1	2	3
3 ... hatte ich Mühe, mich zu konzentrieren.	0	1	2	3
4 ... war ich deprimiert/niedergeschlagen.	0	1	2	3
5 ... war alles anstrengend für mich.	0	1	2	3
6 ... dachte ich, mein Leben ist ein einziger Fehlschlag.	0	1	2	3
7 ... hatte ich Angst.	0	1	2	3
8 ... habe ich schlecht geschlafen.	0	1	2	3
9 ... war ich fröhlich gestimmt.	0	1	2	3
10 ... habe ich weniger als sonst geredet.	0	1	2	3
11 ... fühlte ich mich einsam.	0	1	2	3
12 ... habe ich das Leben genossen.	0	1	2	3
13 ... war ich traurig.	0	1	2	3
14 ... hatte ich das Gefühl, dass mich die Leute nicht leiden können.	0	1	2	3
15 ... konnte ich mich zu nichts aufraffen.	0	1	2	3

[Rosenberg Self Esteem Scale – German Adaptation]

Bitte kreuzen Sie an, welche Aussage auf Sie zutrifft.

		trifft gar nicht zu	trifft eher nicht zu	trifft eher zu	trifft voll und ganz zu
1	Alles in allem bin ich mit mir selbst zufrieden.	1	2	3	4
2	Hin und wieder denke ich, dass ich gar nichts tauge.	1	2	3	4
3	Ich besitze eine Reihe guter Eigenschaften.	1	2	3	4
4	Ich besitze die gleichen Fähigkeiten wie die meisten anderen Menschen auch.	1	2	3	4
5	Ich fürchte, es gibt nicht viel, worauf ich stolz sein kann.	1	2	3	4
6	Ich fühle mich von Zeit zu Zeit richtig nutzlos.	1	2	3	4
7	Ich halte mich für einen wertvollen Menschen, jedenfalls bin ich nicht weniger wertvoll als andere auch.	1	2	3	4
8	Ich wünschte, ich könnte vor mir selbst mehr Achtung haben.	1	2	3	4
9	Alles in allem neige ich dazu, mich für einen Versager zu halten.	1	2	3	4
10	Ich habe eine positive Einstellung zu mir selbst gefunden.	1	2	3	4

[Rumination About Being Overweight]

Nehmen Sie zu den folgenden Aussagen Stellung und entscheiden Sie, inwieweit jede **auf Sie ganz persönlich zutrifft**. Lassen Sie bitte keine Aussage aus.

	1 = stimmt überhaupt nicht 2 = stimmt weitgehend nicht 3 = stimmt eher nicht 4 = stimmt ein wenig 5 = stimmt weitgehend 6 = stimmt genau	stimmt überhaupt nicht	stimmt weitgehend nicht	stimmt eher nicht	stimmt ein wenig	stimmt weitgehend	stimmt genau
1	Ich grüble oft über mein Übergewicht.	1	2	3	4	5	6
2	Die Sorgen um mein Übergewicht blockieren meine Gedanken.	1	2	3	4	5	6
3	Ich kann an nichts anderes mehr denken als an mein Übergewicht.	1	2	3	4	5	6
4	Die Gedanken an mein Übergewicht gehen mir nicht mehr aus dem Kopf.	1	2	3	4	5	6

4

[Dutch Eating Behavior Questionnaire Revised – DEBQ-R]

Bitte beurteilen Sie durch Ankreuzen, wie häufig die Aussagen für Sie zutreffen.

		nie	selten	manch-mal	oft	immer
1	Ich versuche, zwischen den Mahlzeiten nicht zu essen, weil ich auf mein Gewicht achte.	1	2	3	4	5
2	Wenn ich in letzter Zeit zugenommen habe, esse ich weniger als sonst.	1	2	3	4	5
3	Ich denke an mein Gewicht bei der Entscheidung, was ich esse.	1	2	3	4	5
4	Ich versuche, während der Mahlzeiten weniger zu essen, als ich gerne essen würde.	1	2	3	4	5
5	Ich esse bewusst weniger, um nicht zuzunehmen.	1	2	3	4	5
6	Ich esse bewusst kalorienarme Lebensmittel.	1	2	3	4	5
7	Ich achte genau auf das, was ich esse.	1	2	3	4	5
8	Ich versuche, am Abend nichts zu essen, weil ich auf mein Gewicht achte.	1	2	3	4	5
9	Ich lehne Speisen oder Getränke ab, weil ich um mein Gewicht besorgt bin.	1	2	3	4	5
10	Wenn ich an einem Tag zuviel gegessen habe, esse ich am nächsten Tag weniger.	1	2	3	4	5

5

[Coping Strategies Inventory – Shortform]

Die folgenden Aussagen beziehen sich darauf, wie Menschen mit ihrem Übergewicht umgehen. Versuchen Sie sich an Situationen im letzten halben Jahr zu erinnern, in denen Ihnen bewusst wurde, dass Sie übergewichtig sind. Bitte geben Sie durch Ankreuzen an, wie häufig Sie die folgenden Strategien im letzten halben Jahr verwendet haben, um mit Ihrem Übergewicht umzugehen.

1 = nie
2 = selten
3 = manchmal
4 = oft
5 = immer

Mit meinem Übergewicht bin ich folgendermaßen umgegangen...	**nie**	**selten**	**manchmal**	**oft**	**immer**
1. Ich habe weitergemacht wie bisher, so als ob nichts passiert wäre.	1	2	3	4	5
2. Ich habe realisiert, dass ich selbst für meine Schwierigkeiten verantwortlich bin und habe mir eine Standpauke gehalten.	1	2	3	4	5
3. Ich habe mehr Zeit alleine verbracht.	1	2	3	4	5
4. Ich habe mir einen Plan gemacht, was ich dagegen unternehmen will.	1	2	3	4	5
5. Ich habe versucht, die Dinge in einem anderen Licht zu sehen und das Beste daraus gemacht.	1	2	3	4	5
6. Ich habe meine Gefühle irgendwie herausgelassen.	1	2	3	4	5
7. Ich habe mit jemandem darüber geredet, wie ich mich fühlte.	1	2	3	4	5
8. Ich habe versucht, die ganze Sache zu vergessen.	1	2	3	4	5
9. Ich habe die Dinge so akzeptiert, wie sie sind.	1	2	3	4	5
10. Ich habe mir gewünscht, dass es einfach vorbeigehen oder aufhören würde.	1	2	3	4	5
11. Ich habe mir selbst die Schuld gegeben.	1	2	3	4	5
12. Ich habe meine Familie und Freunde gemieden.	1	2	3	4	5
13. Ich ging das Problem direkt an.	1	2	3	4	5
14. Ich habe mich gefragt, was wirklich wichtig für mich ist, und merkte, dass die Dinge nicht so schlecht standen.	1	2	3	4	5
15. Ich habe gehofft, ein Wunder würde geschehen.	1	2	3	4	5
16. Ich habe Dinge gesagt oder getan, um meine Gefühle loszuwerden.	1	2	3	4	5
17. Ich habe mit jemandem geredet, der mir nahe steht.	1	2	3	4	5
18. Ich habe gelernt, damit zu leben.	1	2	3	4	5
19. Ich habe es nicht an mich herangelassen; ich habe mich geweigert, zuviel darüber nachzudenken.	1	2	3	4	5
20. Ich habe mir gewünscht, es hätte nie angefangen.	1	2	3	4	5
21. Ich kritisierte mich selbst dafür, was geschehen war.	1	2	3	4	5
22. Ich habe es vermieden, unter Leute zu gehen.	1	2	3	4	5
23. Ich wusste, was zu tun war; also verdoppelte ich meine Anstrengung und versuchte, die Dinge ins Laufen zu bringen.	1	2	3	4	5

Mit meinem Übergewicht bin ich folgendermaßen umgegangen....	nie	selten	manch-mal	oft	immer
24. Ich habe mich davon überzeugt, dass die Dinge nicht so schlecht sind, wie es scheint.	1	2	3	4	5
25. Ich habe mir klargemacht, wie ich mich fühlte, und drückte dies einfach aus.	1	2	3	4	5
26. Ich habe einen Freund oder Verwandten gefragt, dessen guten Rat ich respektiere.	1	2	3	4	5
27. Ich habe akzeptiert, dass man es nicht ändern kann.	1	2	3	4	5
28. Ich habe vermieden, über die Situation nachzudenken oder etwas zu tun.	1	2	3	4	5
29. Ich hoffte, wenn ich lang genug warten würde, würden die Dinge schon wieder in Ordnung kommen.	1	2	3	4	5
30. Da das, was passiert ist, meine Schuld war, machte ich mir Vorwürfe.	1	2	3	4	5
31. Ich habe meine Bemühungen darauf konzentriert, etwas an der Situation zu ändern, in der ich war.	1	2	3	4	5
32. Ich habe versucht, die positiven Aspekte der Umstände zu sehen.	1	2	3	4	5
33. Ich habe meinen Gefühlen freien Lauf gelassen, um Stress abzubauen.	1	2	3	4	5
34. Ich habe jemanden gesucht, der ein guter Zuhörer war.	1	2	3	4	5
35. Ich habe einige Zeit alleine verbracht.	1	2	3	4	5
36. Ich habe mich an den Gedanken gewöhnt, dass es so gekommen ist.	1	2	3	4	5

a) Wie belastend waren durchschnittlich die Situationen, in denen Ihnen bewusst wurde, dass Sie übergewichtig sind? ☐ gar nicht ☐ eher nicht ☐ eher ja ☐ sehr

b) Beschreiben Sie kurz eine typische Situation:_____

7

[Shame and Guilt Concerning Eating Scale – SG]

Geben Sie durch Ankreuzen an, wie oft Sie diese Gefühle in den **letzten sechs Monaten** erlebten.

Wenn ich eine Portion esse, die die meisten Menschen als normal ansehen würden,...	nie	selten	manch-mal	oft	immer
... mache ich mir selbst Vorwürfe.	1	2	3	4	5
... schäme ich mich so vor anderen, dass ich am liebsten im Boden versinken würde.	1	2	3	4	5
Wenn ich mich überesse,...	**nie**	**selten**	**manch-mal**	**oft**	**immer**
... mache ich mir selbst Vorwürfe.	1	2	3	4	5
... schäme ich mich so vor anderen, dass ich am liebsten im Boden versinken würde.	1	2	3	4	5

[Weight- and Body-Related Shame and Guilt Scale – WEB-SG]

	nie	selten	manch-mal	oft	immer
1. Wenn ich mehr gegessen habe als ich wollte, dann habe ich Schuldgefühle.	1	2	3	4	5
2. Wenn ich in Situationen bin, in denen andere meinen Körper sehen können (z.B. Schwimmbad/ Umkleide), schäme ich mich.	1	2	3	4	5
3. Wenn ich „Dickmacher“ (z.B. Torte) esse, plagt mich hinterher das Gefühl, etwas falsch gemacht zu haben.	1	2	3	4	5
4. Das Aussehen meines Körpers ist mir vor anderen Leuten peinlich.	1	2	3	4	5
5. Wenn ich es nicht schaffe, mich körperlich/sportlich zu betätigen, dann habe ich ein schlechtes Gewissen.	1	2	3	4	5
6. Wenn ich daran denke, dass andere meine Figur nackt sehen könnten, möchte ich am liebsten im Boden versinken.	1	2	3	4	5
7. Ich schäme mich, wenn andere Leute erfahren, wie viel ich wirklich wiege.	1	2	3	4	5
8. Wenn ich mein Gewicht nicht in den Griff bekomme, habe ich das Gefühl, dass das meine eigene Schuld ist.	1	2	3	4	5
9. Ich mache mir selbst Vorwürfe, wenn ich gute Vorsätze breche, die mein Essen betreffen.	1	2	3	4	5
10. Ich vermeide es, mich vor anderen körperlich anzustrengen, da es mir peinlich ist.	1	2	3	4	5
11. Wenn ich mich im Spiegel sehe, dann nehme ich mir schlechten Gewissens vor, mehr für meine Figur zu tun.	1	2	3	4	5
12. Da mir meine Kleidergrößen peinlich sind, würde ich es am liebsten vermeiden, neue Bekleidung in Geschäften einzukaufen.	1	2	3	4	5

8

[Body Self-Acceptance]

Kreuzen Sie bitte die Zahl an, die Ihrer Antwort entspricht. Bitte beantworten Sie alle Fragen.

	trifft gar nicht zu	trifft nicht zu	trifft eher nicht zu	trifft etwas zu	trifft zu	trifft sehr zu
1. Ich würde gerne einige Teile meines Körpers austauschen.	1	2	3	4	5	6
2. Ich habe mehr körperliche Mängel als andere.	1	2	3	4	5	6
3. Es stört mich nicht, wenn mein äußeres Erscheinungsbild von dem meiner Umgebung abweicht.	1	2	3	4	5	6
4. Meine kleinen „Schönheitsfehler“ belasten mich nicht.	1	2	3	4	5	6
5. Ich bin mit meinem Aussehen zufrieden.	1	2	3	4	5	6
6. Ich sehe ganz gut aus.	1	2	3	4	5	6

A.5 Obesity Interview at Time 1

Kode:

Datum:

Adipositas-Interview (Version T1)

Im Folgenden will ich Ihnen noch einige Fragen zu Ihrem Übergewicht stellen.
Ich werde Ihnen der Einfachheit halber Antwortkategorien vorgeben, und Sie wählen dann die für Sie richtige Antwort aus.

I. Einstellung zur Adipositas, Gesundheitssorgen und -verhalten

1 Alter: Geschlecht:

Größe: Gewicht:

2 Seit wann sind Sie übergewichtig? (Seit dem Alter von) ☐

3 Wie zufrieden sind Sie mit Ihrem aktuellen Gewicht?

☐ gar nicht ☐ eher nicht ☐ eher ja ☐ sehr

4 Erleben Sie Ihr Übergewicht als störend?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

5 Erleben Sie Ihr Übergewicht als quälend?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

a) Seit wann? (Jahre) von: ☐ bis: ☐

b) Aus welchem Grund oder in welchen Situationen? _____

_____

6 Machen Sie sich aufgrund Ihres Übergewichts Sorgen um Ihre Gesundheit?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

7 Haben Sie Angst vor „Folgeerkrankungen“, also Erkrankungen, die durch das Übergewicht ausgelöst werden könnten?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

Wenn ja, welche? _____

8 Machen Sie sich Sorgen über die Möglichkeit, Ihr Übergewicht an Ihre Kinder zu vererben?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

9 Haben Sie im letzten halben Jahr gedacht, dass Sie jemals normalgewichtig werden können, d.h. BMI < 30? (Sprungregel bezieht sich nur auf [a]!)

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

Gab es einen Anlass?.....

a) Gab es Zeiten, in denen Sie anders dachten, ...

... d.h. dass Sie normalgewichtig werden können? ☐ Ja ☐ Nein
... d.h. dass Sie dauerhaft übergewichtig bleiben? ☐ Ja ☐ Nein

b) Zeitraum: (Jahre) von:..... bis:.....

10 Wie oft haben Sie in den letzten **zwei Jahren** versucht, Ihr Gewicht zu reduzieren?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ständig

Wie viele Versuche:.....

a) Wie machen Sie das? ☐ Diäten (kalorienreduziert) ☐ Medikamente

☐ Bewegung ☐ Operationen Weitere:_____

11 Waren die Mehrzahl der Versuche (auch frühere), das Gewicht zu reduzieren, langfristig erfolgreich (> 5 J.)? ☐ Ja ☐ Nein

a) Wie viel Gewicht haben Sie jemals bewusst abgenommen? (maximal) _____kg

b) Wie lange konnten Sie das neue Gewicht halten? _____Monate

c) Gab es Nebeneffekte bei der Gewichtsabnahme (körperliche/psychische/soziale)? ☐ Ja ☐ Nein

Positive:_____

Negative:_____

12 Sind Sie von einem Arzt / Betriebsarzt oder anderen im Gesundheitswesen tätigen Personen dazu aufgefordert worden, abzunehmen? ☐ Ja ☐ Nein

☐ Diät ☐ Medikamente ☐ Bewegung

☐ keine Empfehlung Weitere:_____ Wie häufig?_____

a) Sind Sie von Freunden oder Angehörigen dazu aufgefordert worden, abzunehmen?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

b) Sind Sie ausdrücklich aufgrund Ihres Übergewichts jemals stationär behandelt worden? ☐ Ja ☐ Nein

Wie häufig?_____

13 Haben Sie in Zukunft vor, Ihr Gewicht zu reduzieren? ☐ Ja ☐ Nein

Falls nein, warum nicht:_____

a) Wie? ☐ Diät ☐ Medikamente ☐ Bewegung
☐ Operationen Weitere:_____

b) Wie wahrscheinlich rechnen Sie mit einem Erfolg bei einer Gewichtsabnahme von 5% (in kg) in 6 Monaten? _____%

c) Glauben Sie, dass Sie dieses Gewicht dauerhaft halten können? (mehrere Jahre) ☐ Ja ☐ Nein

d) Wären Sie mit 5% Gewichtsabnahme zufrieden?

☐ gar nicht ☐ eher nicht ☐ eher ja ☐ sehr

II. Schuld- und Schamgefühle

14 Kennen Sie Schuld- und Schamgefühle beim Essen? ☐ Ja ☐ Nein

a) Leiden Sie darunter?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

15 ... im Zusammenhang mit ihrem Körper/Figur? ☐ Ja ☐ Nein

a) Leiden Sie darunter?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

16 ...im Zusammenhang mit Bewegung und körperlicher Anstrengung? ☐ Ja ☐ Nein

a) Leiden Sie darunter?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

A.6 Obesity Interview at Time 2

Kode:

Datum:

Adipositas-Interview (Version T2)

Im folgenden will ich Ihnen noch einige Fragen zu Ihrem Übergewicht stellen.
Ich werde Ihnen der Einfachheit halber Antwortkategorien vorgeben und Sie wählen dann die für Sie richtige Antwort aus.

I. Einstellung zur Adipositas, Gesundheitssorgen und -verhalten

1 Wie zufrieden sind Sie mit Ihrem aktuellen Gewicht?

☐ gar nicht ☐ eher nicht ☐ eher ja ☐ sehr

2 Erleben Sie Ihr Übergewicht als störend?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

3 Erleben Sie Ihr Übergewicht als quälend?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

Aus welchem Grund oder in welchen Situationen? _____

_____

4 Machen Sie sich aufgrund Ihres Übergewichts Sorgen um Ihre Gesundheit?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

5 Haben Sie Angst vor „Folgeerkrankungen", also Erkrankungen, die durch das Übergewicht ausgelöst werden könnten?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

Wenn ja, welche? _____

6 Machen Sie sich Sorgen über die Möglichkeit, Ihr Übergewicht an Ihre Kinder zu vererben?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

7 Haben Sie im letzten halben Jahr gedacht, dass Sie jemals normalgewichtig werden können, d.h. BMI < 30?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

Gab es einen Anlass?.....

8 Wie oft haben Sie im letzten **halben Jahr** versucht, Ihr Gewicht zu reduzieren?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ständig

Wie viele Versuche:.....

a)Wie haben Sie das gemacht?

☐ Diäten (kalorienreduz.) ☐ Medikamente

☐ Bewegung ☐ Operationen Weitere:_____

b) Wie viel Gewicht haben Sie dabei maximal abgenommen?) _____kg

c) Gab es Nebeneffekte bei der Gewichtsabnahme (körperliche/psychische/soziale)? ☐ Ja ☐ Nein

Positive:_____

Negative:_____

9 Sind Sie im letzten halben Jahr von einem Arzt / Betriebsarzt oder anderen im Gesundheitswesen tätigen Personen dazu aufgefordert worden, abzunehmen? ☐ Ja ☐ Nein

Wenn ja: ☐ Diät ☐ Medikamente ☐ Bewegung

☐ keine Empfehlung Weitere:_____ Wie häufig?_____

a) Sind Sie im letzten ½ Jahr von Freunden oder Angehörigen dazu aufgefordert worden, abzunehmen?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

b) Sind Sie ausdrücklich aufgrund Ihres Übergewichts im letzten ½ Jahr stationär behandelt worden? ☐ Ja ☐ Nein

10 Aktuelles Gewicht:

a) Haben Sie in Zukunft vor, Ihr Gewicht zu reduzieren? ☐ Ja ☐ Nein

Falls nein, warum nicht:_____

b) Wie? ☐ Diät ☐ Medikamente ☐ Bewegung

☐ Operationen Weitere:_____

c) Wie wahrscheinlich rechnen Sie mit einem Erfolg bei einer Gewichtsabnahme von 5% (in kg) in 6 Monaten? _____%

d) Glauben Sie, dass Sie dieses Gewicht dauerhaft halten können? (mehrere Jahre) ☐ Ja ☐ Nein

e) Wären Sie mit 5% **dauerhafter** Gewichtsabnahme zufrieden?

☐ gar nicht ☐ eher nicht ☐ eher ja ☐ sehr

11 Akzeptieren Sie Ihr Übergewicht?

☐ gar nicht ☐ eher nicht ☐ eher ja ☐ voll und ganz

a) Was könnte Ihnen helfen, es zu akzeptieren?.....

b) Was hat Ihnen dabei geholfen?.....

12 Wenn Sie rückblickend das letzte halbe Jahr betrachten, können Sie ihr Gewicht nun besser annehmen?

☐ gar nicht ☐ eher nicht ☐ eher ja ☐ voll und ganz

a) Was hat dazu geführt?.....

II. Schuld- und Schamgefühle

13 Kennen Sie Schuld- und Schamgefühle beim Essen? ☐ Ja ☐ Nein

a) Leiden Sie darunter?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

14 .... im Zusammenhang mit ihrem Körper/Figur? ☐ Ja ☐ Nein

a) Leiden Sie darunter?

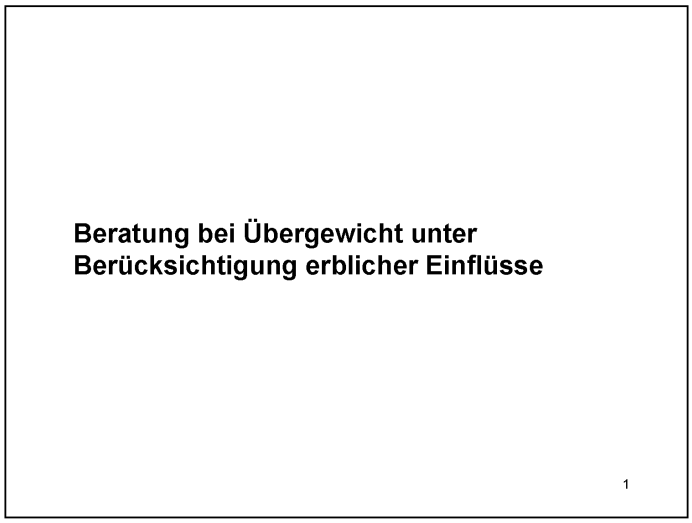
☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

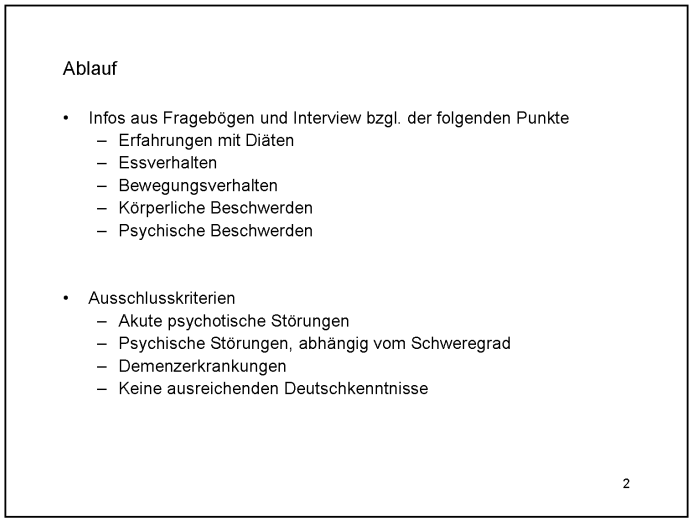
15 Kennen Sie Schuld- und Schamgefühle im Zusammenhang mit Bewegung und körperlicher Anstrengung? ☐ Ja ☐ Nein

a) Leiden Sie darunter?

☐ gar nicht ☐ manchmal ☐ häufig ☐ ja, ständig

A.7 Manual of the Consultation With Genetic Information About Obesity

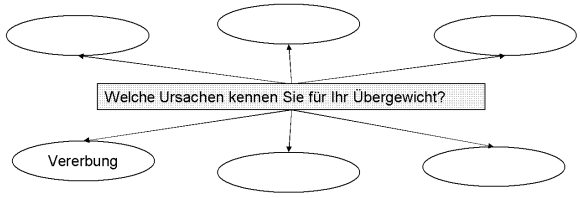




Erst einmal vielen Dank für die Mitarbeit bei den Interviews & bei den Fragebögen.
Wir kommen jetzt zur Beratung, die etwa 30-45 Minuten dauern wird.
Ich möchte Ihnen im Folgenden vermitteln,

- dass die Vererbung bei Übergewicht eine größere Rolle spielt als man bisher annahm.
- dass die meisten Abnehmversuche scheitern und deshalb zu unnötigen Versagergefühlen führen können.

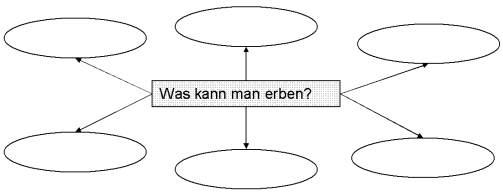
Welche Ursachen kennen Sie bislang für die Entstehung von Übergewicht?



In dieser Beratung möchten wir uns vor allen Dingen mit dem Punkt **Vererbung** beschäftigen.

3

➜ Was meinen Sie wird alles vererbt?

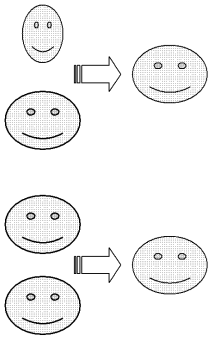


Besonders wichtig: Reaktionen auf die Umwelt herauszuarbeiten

Die Forschung hat in den letzten Jahren gezeigt, dass das Erbgut einen sehr starken Einfluss auf Gewicht bzw. Übergewicht bei Menschen hat, der bislang unterschätzt bzw. zu wenig berücksichtigt wurde. Heute weiß man, dass bei 80% stark übergewichtiger Kinder mind. ein Elternteil ebenfalls übergewichtig ist, bei 30% sogar beide Eltern.

4

Verdeutlichung der Häufigkeit der Belastung

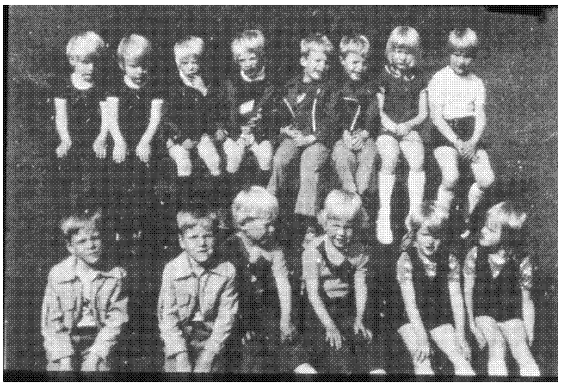


Bei 80% der stark übergewichtigen Kinder ist mindestens ein Elternteil übergewichtig.

Bei 30% der stark übergewichtigen Kinder sind beide Eltern übergewichtig.

Eltern Kind

5



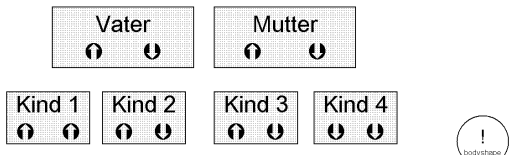
6

- Genauso verhält es sich mit dem Körper. Nicht nur die Figur bzw. das Gewicht wird vererbt, sondern auch, wie der Körper auf ein Nahrungsüberangebot in unserer Wohlstandsgesellschaft oder auf zu wenig Bewegung reagiert.
- Es gibt Personen, die genauso viel essen wie Übergewichtige, die aber nicht so zunehmen. Oder: Person X muss 1h pro Woche Sport treiben, um das Gewicht zu halten, Person Y dagegen 3h. Auch das kann vererbt sein.
- Erbanlagen wirken sich also auf ganz verschiedene Aspekte aus:
  - Nahrungswahl und -menge
  - Stoffwechsel in Ruhe und in Bewegung
  - Umfang der körperlichen Aktivität
  - Geschmacksvorlieben
  - Den Einfluss von Stress auf Appetit

7

In sog. Adoptionsstudien untersuchte man den Zusammenhang zwischen dem Gewicht der Adoptivkinder und dem der Adoptiveltern. Es zeigte sich kaum ein Zusammenhang zwischen dem Gewicht der Adoptivkinder und dem der Adoptiveltern. Die gemeinsame Umwelt scheint also kaum eine Rolle zu spielen. Auch bei getrennten Zwillingen fand man eine starke Ähnlichkeit bzgl. des Gewichts. Hier wird der genetische Einfluss auf 60-80% geschätzt.

Ich will es Ihnen einmal ganz einfach veranschaulichen. Kinder erhalten von Mutter und Vater je die Hälfte des Erbguts, also 50/50.
☊ ist ein Paket Erbanlagen, das dick macht. ☋ ist ein Paket Erbanlagen, das schlank macht. Je nachdem, welche Pakete der Erbanlagen die Kinder bekommen, kann ihr Gewicht unterschiedlich sein.



8

Von Vornherein kann man nicht sagen, ob ein Kind eher normalgewichtig oder eher übergewichtig werden wird, weil niemand weiß, welche Erbanlagen ein Kind bekommen hat.

Im Nachhinein kann man aber sagen: wenn ein Kind übergewichtig ist und Mutter oder Vater auch übergewichtig sind, dann liegt mit hoher Wahrscheinlichkeit eine Erbanlage zu Übergewicht vor. Sie erinnern sich, dass bei 80% der stark Übergewichtigen zumindest ein Elternteil ebenfalls stark übergewichtig ist.

****

Jetzt kommen wir zu Ihrem persönlichen Fall:
Sie hatten Ihr Blut bei uns testen lassen. Wir haben Ihr Blut auf die sog. „MC4R-Mutation" untersucht. Das ist eine Veränderung von Erbanlagen, die eindeutig identifizierbar ist und sich nur bei übergewichtigen Menschen findet. D.h. durch diese Veränderung im Erbmaterial entsteht Übergewicht. Sie findet sich bei etwa 1-3% der Übergewichtigen, ist also extrem selten.

9

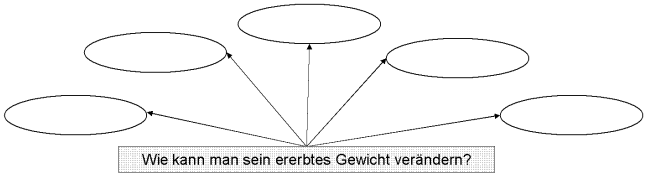
MC4R-Positiv:	Familiäre Belastung:	Keine Belastung:
Bei Ihnen wurde genau diese bestimmte erbliche Veränderung nachgewiesen. D.h., Sie *mussten* mit hoher Wahrscheinlichkeit aufgrund dieser Veränderung übergewichtig werden; Sie selbst konnten das praktisch gar nicht verhindern. Wenn Sie weitere Informationen über diese Erbveränderung haben möchten, steht Ihnen Prof. Hebebrand für ein Gespräch zur Verfügung.	Bei Ihnen konnten wir diese eindeutige Erbveränderung nicht nachweisen. D.h. aber nicht, dass Sie nicht erblich belastet sind. Wie Sie beim letzten Termin angegeben haben, ist Ihre Mutter/Vater/ Schwester/Bruder übergewichtig (Arbeitsblatt: Body Shape). Das spricht bei Ihnen für eine Veranlagung, so wie wir es Ihnen mit den Bildern zu Vererbung zeigen wollten.	Bei Ihnen konnten wir weder diese eindeutige erbliche Veränderung noch eine familiäre Belastung feststellen (also übergewichtige Eltern oder Geschwister). Wir können zur Zeit also keine offensichtliche erbliche Belastung nachweisen. D.h. aber nicht, dass es keine erbliche Ursache gibt! (Bild Erbanlagen).

Im nächsten Schritt werden wir besprechen, welche Konsequenzen Ihre (mögliche) erbliche Veranlagung nun auf Bewegung und Essen hat und wie sie gleichzeitig etwas für Lebensqualität und somit Gesundheit tun können.

10

➜ Was glauben Sie, wie man sein <u>ererbtes</u> Gewicht verändern kann?

! 10 Diäten



Wie würden Sie die Versuche bilanzieren?

Durch eine große Anzahl von Untersuchungen wissen wir heute, dass Diäten für die allermeisten Menschen, nämlich 95%, keinen dauerhaften Erfolg bringen. D.h. von 100 Menschen, die eine Diät machen, haben 95 Menschen keinen dauerhaften Erfolg. Diese Untersuchungen zeigen auch, dass die meisten Menschen Diäten gar nicht durchhalten können, wodurch sie glauben, dass sie einen zu schwachen Willen hätten und sich deshalb als Versager fühlen und schämen.

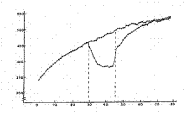
11

Warum glauben die meisten aber, dass durch Diäten das Gewicht dauerhaft verändert werden kann?

! Diäten

Das kann daran liegen, dass man am Anfang einer Diät mehr oder weniger leicht Gewicht verliert. Wenn man weniger isst, hat der Körper weniger Energie für die täglichen Aktivitäten zur Verfügung und greift deshalb auf seine Fettreserven zurück. Aber mit der Zeit <u>stellt sich der Körper auf die eingeschränkte Ernährung ein</u> und kommt bereits mit weniger Energie aus. Das ist der Zeitpunkt, an dem man langsamer oder überhaupt nicht mehr abnimmt.

Wenn man aber nun die Diät beendet, steht plötzlich mehr Energie als notwendig zur Verfügung, da wieder normale Portionen gegessen werden. Überschüssige Energie wird wieder als Fettpolster oder Reserve für Notzeiten (nächste „Diät“) angelegt. Bei nicht wenigen Menschen steigt das Gewicht sogar noch über das Ausgangsgewicht. Wir nennen diese Beobachtung <u>Jojo-Effekt</u>, da das Gewicht sich zuerst nach unten und dann wieder nach oben pendelt wie ein Jojo.



12

Natürlich gibt es auch Vorteile: dass man Anerkennung bekommt, wieder in Kleider passt; man ist erst einmal stolz, dass man es geschafft hat, seinen Hunger zu unterdrücken.
Nachteile von Diäten sind, dass man verlernt, die körpereigenen Signale von Hunger und Sättigung wahrzunehmen, so dass man das Essen mehr an äußeren Regeln, nämlich Diätregeln, orientiert. Dies hat zur Folge, dass Sie oftmals nicht mehr spüren, ob Sie überhaupt Hunger haben oder nicht.
Für den Großteil der Leute überwiegen in der Bilanz die Nachteile, obwohl es eine persönliche, ganz individuelle Kosten-Nutzen-Abwägung ist.

! 10 Nebenwirkungen

13

Wenn man aber unbedingt abnehmen will, dann würde das bei Ihnen in Ihrer Gewichtskurve so aussehen: Blatt „Gewichtsverlauf".

! 11 Reduktion

14

Die erbliche Belastung legt nahe, das Übergewicht zu akzeptieren wie die Körpergröße oder die Haarfarbe.

Deshalb möchten wir Ihnen ganz allgemein folgende Empfehlung bezüglich Ihres Essverhaltens und Bewegungsverhaltens geben:

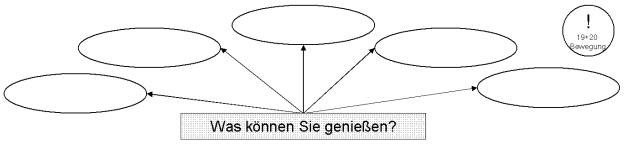
- Achten Sie bei allem, was Sie sich vornehmen (Essen, Bewegung, Sport), dass es Ihnen auch Spaß macht.
- Essen Sie regelmäßig, um Heißhungerattacken zu vermeiden.
- Erlauben Sie sich alles essen zu dürfen: Verbote erhöhen nur den Reiz und machen beim Verstoß doch nur schlechtes Gewissen. Wenn Sie mit Genuss essen, sind Sie immer auf der richtigen Seite!
- Was heißt „mit Genuss“?
  - bewusst
  - mit Zeit und Lust
  - auch die kleinen Dinge auf Ihre Art
  - ➜ Die kleine Genussfibel gilt für Bewegung und Essen.

15

Im Folgenden möchten wir einen konkreten Tag anschauen, den sie persönlich mit Schuldgefühlen oder schlechtem Gewissen bilanzierten:

Frühstück	
Zwischendurch	
Mittagessen	
Zwischendurch	
Abendessen	

16



Zum Bewegungsverhalten speziell möchten wir Ihnen Folgendes sagen:

- Hauptsache realistisch! Weniger ist mehr.
- Wählen Sie die Bewegung aus, die Ihnen Spaß macht.
- Fragen Sie sich, ob Ihr Vorsatz zur Bewegung leicht in den Alltag einzubauen ist.
- Planen Sie Muskelkater und Ruhepausen ein.
- Gibt es einen Trainingspartner?
- Lassen Sie sich beraten, von einem Profi, von einem Arzt von einem Sportsfreund!

Wir haben eine Liste von Beispielen, die zwar nicht für alle passen,
aber vielleicht finden Sie etwas für sich.

17

Ideen zur Bewegung

Indoor	In der Stadt	Outdoor	Rund ums Wasser
Beim Telefonieren herumgehen	Bummeln gehen	Einen Waldspaziergang machen	Angeln
Wäsche waschen / bügeln	Ein Museum besuchen	Fahrrad fahren	Tauchen
Handwerklich arbeiten	Einen Stadtrundgang machen	Im Garten arbeiten	Wassertreten im Kneippbecken
Gymnastik	Im Park spazieren gehen	Frisbee spielen	Schwimmen
Tanzen	Aussichtspunkte ersteigen	Pilze suchen	Planschen
Yoga	Ins Schwimmbad gehen	Inline-Skates fahren	Segeln
Kochen & Backen	Boule spielen	Drachen steigen lassen	Surfen
Mit einem Haustier spielen	Minigolf spielen	Eine Flusswanderung machen	Sandburgen bauen
Mit Kindern spielen	Einkaufen gehen	Einen Tierheimhund ausführen	Tretboot fahren
Hanteln	Rudern auf der Lahn	Fußball spielen	Kanu fahren
Heimtrainer	Den Zoo besuchen	Sich einem Wander-verein anschließen	Wassergymnastik machen
Tischkicker spielen	Ins Fitnessstudio gehen	Skilanglauf / Schlitten fahren	Im Wasser fangen spielen
Aufräumen (Keller, Dachboden)	Eine Bushaltestelle weitergehen	Golf spielen	Wasserrutschbahn fahren
Tanzen	Treppensteigen, statt den Aufzug zu nehmen	Wandern	Muscheln sammeln
Fahrrad putzen	Das Auto weiter weg vom Ziel parken	Reiten	Wasserball spielen
Billard spielen	Eine Stadtrallye machen	Paragliding	Whirlpool
Dart spielen	Ein Stadtfest besuchen	Schlittschuh laufen	Am Strand spazieren gehen
Schuhe putzen		Tai-Chi machen	Steine werfen
Wäsche waschen & Bügeln		Tischtennis	
Staubsaugen		Klettern	
Kegeln			

18

Kernbotschaft:

- Vererbung wurde bei der Behandlung von Übergewicht bislang zu wenig berücksichtigt, d. h. man ist nicht schuld an seinem Übergewicht.
- Wir wissen, dass es nur den allerwenigsten Menschen gelingt, für immer gegen das ererbte Übergewicht anzugehen und ihr neues Gewicht zu halten. Das schaffen in der Regel nur 5 von 100 Menschen.
- Wir wissen nicht, ob Sie zu diesen Fünf gehören!
- Wir wissen, dass gescheiterte Abnehmversuche zu unnötigen Versagergefühlen und dem Verlust von Lebensqualität führen.
- Unsere Empfehlung ist, regelmäßig mit Genuss zu essen und sich ausreichend zu bewegen!

➜ Insgesamt rechtfertigt unser medizinisches Wissen zur Vererbung des Übergewichts die Empfehlung, das Übergewicht zu akzeptieren.

19

Wenn Sie das hören:
➜ Was heißt das nun für Sie?
➜ Welches Gefühl löst das bei Ihnen aus?

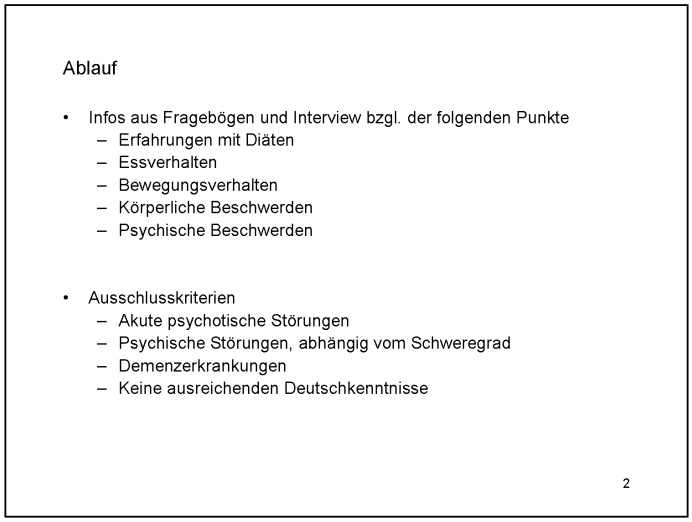
Was können Sie jetzt konkret für sich mit nach Hause nehmen?

_____
_____
_____
_____
_____

Vielen Dank für Ihre Aufmerksamkeit! Wir bitten Sie jetzt, uns eine Rückmeldung zur Beratung zu geben.

20

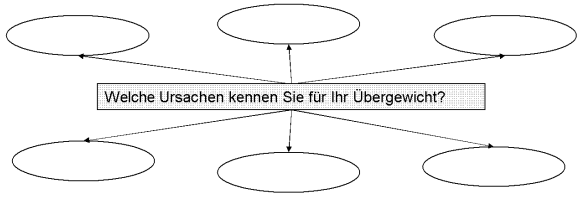
A.8 Manual of the Consultation Without Genetic Information About Obesity



Erst einmal vielen Dank für die Mitarbeit bei den Interviews & bei den Fragebögen.
Wir kommen jetzt zur Beratung, die etwa 30 Minuten dauern wird.
Ich möchte Ihnen im Folgenden vermitteln,

- dass die meisten Abnehmversuche scheitern und deshalb zu unnötigen Versagergefühlen führen können.

Welche Ursachen kennen Sie bislang für die Entstehung von Übergewicht?



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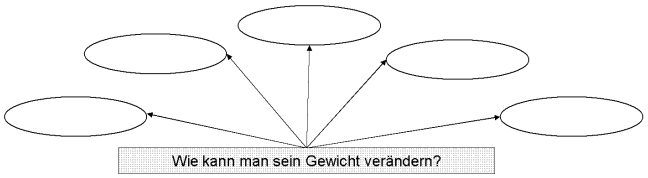
3

➜ Was glauben Sie, wie man sein Gewicht verändern kann?



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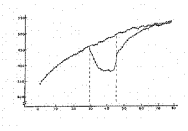

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! 11 Reduktion

7

! bodyshape

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!
17+18 Essen

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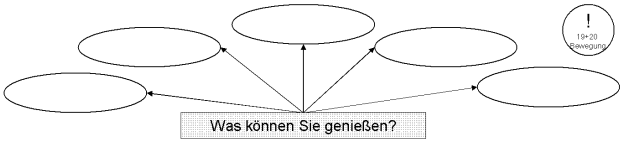
9



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Staubsaugen		Klettern	
Kegeln			

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Kernbotschaft:

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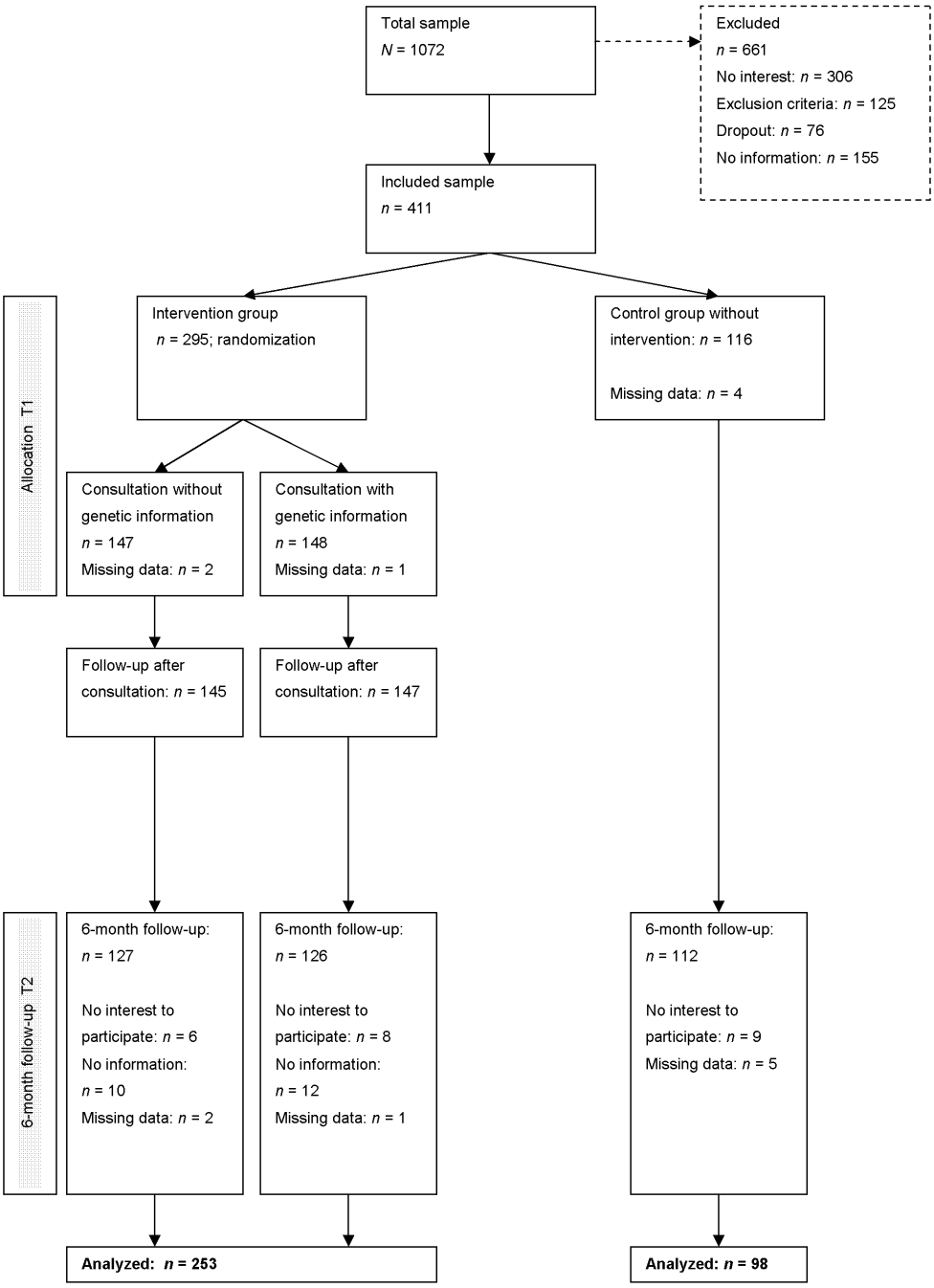
13

B.1 Sampling Procedure



B.2 Sociodemographic Variables of the Study Sample

Demographic	
Female (%)	70.7
M age (*SD*)	45.5 (12.9)
M BMI (*SD*)	35.7 (5.3)
Living with partner (%)	70.1
Educational level (%)	
low	30.8
medium	47.7
high	17.9
missing	8.5
At least one obese parent/sibling (%)	56.4

Note. $N = 351$. BMI = body bass index.

B.3 Weight-Related Variables of the Study Sample

Interview question	*M* (*SD*)	Valid data
Number of years being obese	21.9 (13.1)	$n = 340$
Number of weight loss attempts in the last two years	3.35 (3.64)	$n = 277$
Maximum weight loss (kg)	14.2 (10.4)	$n = 339$
Weight loss strategy	%	$n = 317$
Dieting	35.0	
Exercising	6.9	
Dieting + exercising	43.0	
Dieting + exercising + medication	8.1	
Others	6.7	
Gastric banding	0.3	

B.4 Medical Report Variables of the Study Sample

Waist-to-hip ratio	*M* (*SD*)	Valid data
Females	.87 (0.07)	*n* = 240
Males	1.00 (0.06)	*n* = 101
Physical problems	%	
High blood pressure	45.2	*n* = 342
Diabetes mellitus type 2	12.1	*n* = 345
Elevated blood lipids	32.7	*n* = 339
Joint problems	59.3	*n* = 346
Cardiovascular problems	19.4	*n* = 343
Trouble breathing	57.7	*n* = 343

B.5 Comorbid Diagnoses According to DSM-III-R of the Study Sample

DSM-III-R diagnosis	%
Panic disorder	8.0
Agoraphobia	8.0
Social phobia	7.1
Specific phobia	20.8
Generalized anxiety disorder	4.8
Posttraumatic stress disorder	4.0
Obsessive compulsive disorder	2.8
Major depression (lifetime)	20.5
Dysthymic syndrome (lifetime)	2.6
Manic episode (lifetime)	2.0
Hypochondriasis	2.0

Appendix B.5 (continued). **Comorbid Diagnoses According to DSM-III-R of the Study Sample**

DSM-III-R diagnosis	%
Somatization disorder	
1 symptom cluster	5.1
2 symptom cluster	3.7
3 symptom cluster	1.4
All symptom cluster	0.6
Chronic pain disorder	4.0
Conversion disorder	2.8
Binge eating disorder (DSM-IV)	3.1
Psychotic symptoms	
1 symptom	7.7
2 symptoms	0.6
3 symptoms	1.1

Note. $N = 351$.

C.1 Principal Component Analysis (Varimax) of the Coping Strategies Inventory Short Form – Adapted

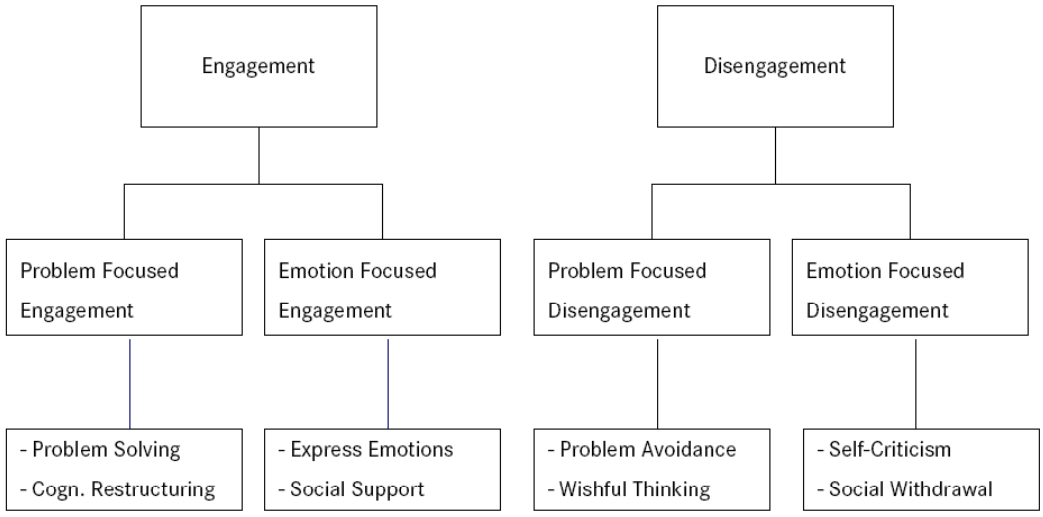
CSI-S items	Factor 2	Factor 3	Factor 1	Factor 5	Factor 7	Factor 6	Factor 4
Explained variance %	9.09	9.07	12.18	7.82	7.01	7.43	8.68
1. I worked on solving the problems in the situation.	**.586**	.408	.083	–.191	.177	.105	.144
9. I made a plan of action and followed it.	**.739**	–.035	.199	.024	.015	.066	.038
17. I tackled the problem head on.	**.748**	.193	.177	–.215	.019	–.057	.010
25. I knew what had to be done, so I doubled my efforts and tried harder to make things work.	**.650**	.314	.123	–.103	–.066	.202	.081
2. I looked for the silver lining, so to speak; I tried to look on the bright side of things.	.402	**.453**	.224	.183	.033	–.153	.132
10. I looked at things in a different light and tried to make the best of what was available.	.069	**.790**	.054	.098	–.095	–.137	–.013
18. I asked myself what was really important, and discovered that things weren't so bad after all.	.194	**.639**	.105	.000	–.051	–.002	–.172
26. I convinced myself that things aren't quite as bad as they seem.	.051	**.765**	.092	.014	–.128	–.023	–.197
3. I let out my feelings to reduce the stress.	–.119	**.595**	**.**469	–.159	.198	–.104	.009
11. I let my feelings out somehow.	.036	.232	**.542**	–.116	.275	–.230	.003
19. I let my emotions out.	.047	–.102	**.618**	–.007	.270	.032	.274
27. I got in touch with my feelings and just let them go.	.154	.405	**.583**	–.123	–.188	.209	–.117
4. I found somebody who was a good listener.	.119	.176	**.743**	.053	.026	.045	.097
12. I talked to someone about how I was feeling.	.202	.015	**.766**	–.124	.104	–.003	–.067
20. I talked to someone that I was very close to.	.084	.132	**.790**	–.113	.051	–.011	–.083
28. I asked a friend or relative I respect for advice.	.222	.057	**.751**	–.031	–.237	.242	.048
5. I went along as if nothing were happening	**–.587**	.058	–.007	**.307**	–.096	–.024	–.061
13. I tried to forget the whole thing.	–.129	.062	–.093	**.741**	.086	–.002	.030
21. I didn't let it get to me; I refused to think about it too much.	–.068	–.073	–.179	**.712**	.175	–.136	.051
29. I avoided thinking or doing anything about the situation.	–.227	.029	–.190	**.678**	.007	–.037	–.062
6. I hoped a miracle would happen.	.032	–.158	.146	.321	**.601**	.203	.116
14. I wished that the situation would go away or somehow be over with.	.112	.029	.083	.304	**.663**	.284	.120
22. I wished that the situation had never started.	.048	–.049	.099	.083	**.647**	.355	.185
30. I hoped that if I waited long enough, things would turn out OK.	–.082	.025	.105	**.655**	.142	.098	.170
7. I realized that I was personally responsible for my difficulties and really lectured myself.	.419	–.097	.179	–.086	.130	**.469**	.036
15. I blamed myself.	–.026	–.061	.040	–.074	.083	**.740**	.084
23. I criticized myself for what happened.	.188	–.041	–.005	.065	.414	**.666**	.236

Appendix C.1 (continued). **Principal Component Analysis (Varimax) of the Coping Strategies Inventory Short Form – Adapted**

CSI-S items	Factor 2	Factor 3	Factor 1	Factor 5	Factor 7	Factor 6	Factor 4
31. Since what happened was my fault I really chewed myself out.	.050	–.067	–.018	.032	.277	**.739**	.240
8. I spent more time alone.	.088	–.045	.004	.097	.040	.168	**.849**
16. I avoided my family and friends.	.095	–.174	–.031	–.021	.434	.094	**.613**
24. I avoided being with people.	.043	–.222	.020	.015	.365	.131	**.705**
32. I spent some time by myself.	.075	.000	.079	.094	–.038	.130	**.857**

Note . $N = 264$. CSI-S = Coping Strategies Inventory Short Form. Item numbers for original subscales: Engagement = 1, 9, 17, 25, 2, 10, 18, 26, 3, 11, 19, 27, 4, 12, 20, 28; Disengagement = 5, 13, 21, 29, 6, 14, 22, 30, 7, 15, 23, 31, 8, 16, 24, 32; Problem Solving = 1, 9, 17, 25; Cognitive Restructuring = 2, 10, 18, 26; Express Emotions & Social Contact = 3, 11, 19, 27, 4, 12, 20, 28; Problem Avoidance = 5, 13, 21, 29, 30; Wishful Thinking = 6, 14, 22; Self Criticism = 7, 15, 23, 31; Social Withdrawal = 8, 16, 24, 32.

C.2 Hierarchical Factor Structure of the Coping Strategies Inventory Short Form



Note. Figure from "User manual for the Coping Strategies Inventory" by D. L. Tobin, 2001, Unpublished manuscript, p. 5. Copyright 2001 by D.L. Tobin. Reprinted with permission of the author.

C.3 Lisrel Syntax for the Confirmatory Factor Analyses

```
!one-factor model: WEB-SG
DA NI=12 NO=165 MA=KM
KM FI=c:\Liz\Gu_Sh\Gu_Sh.cor
MO NX=12 NK=1 PH=ST
LK
sh
FR LX(1,1) LX(2,1) LX(3,1) LX(4,1) LX (5,1) LX(6,1) LX(7,1)
LX(8,1) LX(9,1)  LX(10,1) LX(11,1) LX (12,1)
PATH DIAGRAM
OU ME=ML ND=3 SC RS XM

!two-factor model: WEB-SG
DA NI=12 NO=165 MA=KM
KM FI=c:\Liz\Gu_Sh\Gu_Sh.cor
MO NX=12 NK=2 PH=ST
LK
sh gu
FR LX(1,1) LX(2,1) LX(3,1) LX(4,1) LX (5,1) LX(6,1) LX(7,2)
LX(8,2) LX(9,2)  LX(10,2) LX(11,2) LX (12,2)
PATH DIAGRAM
OU ME=ML ND=3 SC RS XM
```

Erklärung

Ich versichere, dass ich meine Dissertation “Associations Among Obesity-Related Guilt, Shame, and Coping” selbständig, ohne unerlaubte Hilfe angefertigt und mich dabei keiner außer den von mir ausdrücklich bezeichneten Quellen und Hilfen bedient habe.

Die Dissertation wurde in der jetzigen oder einer ähnlichen Form bei keiner anderen Hochschule eingereicht und hat noch keinen sonstigen Prüfungszwecken gedient.

Matthias Conradt
Frankfurt am Main, 14.10.2008