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**RORSCHACH PERSONALITY
CHARACTERISTICS IN OBESITY,
EATING BEHAVIOUR AND
TREATMENT OUTCOME**

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Stockholm 2003

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Published and printed by Karolinska University Press
Box 200, SE-171 77 Stockholm, Sweden
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ISBN 91-7349-711-8

The first step is to measure whatever can be easily measured. That's OK as far as it goes.

The second step is to pretend that whatever cannot easily be measured isn't very important. That's dangerous.

The third step is to pretend that whatever cannot easily be measured doesn't exist. That's suicide.

Daniel Yankelovich

ABSTRACT

Obesity is a growing public health problem influenced by several factors. Psychology is essential in the study of obesity. Reasons for behaviour are complex and can be partly inaccessible and difficult to reveal in self-reported information. A performance-based psychological technique such as the Rorschach method enables a study of underlying personality aspects affecting behaviours and can provide data complementary to self-reports. This can be of particular relevance in deriving more understanding for obesity behaviours. The aim of this thesis was to study Rorschach personality characteristics in relation to obesity, eating behaviour and treatment outcome.

Patients with more difficulties with emotions could be considered to constitute a subgroup that was characterized by eating disorders, periodic variations in food intake and reporting psychological reasons for having an obese body size. Another type of difficulties in obesity could be related to coping with everyday demands. This was more frequent on a lower socio-economic level, and was further confirmed by irregular or chaotic meal habits.

Mental distress was not worse in higher degrees of obesity. Bodily concern was negatively related to body weights, which can give more information on those patients who have reached the most health hazardous, physically limiting weights.

(Study I and II)

Eating behaviour measured by means of a computerized eating monitor was studied in relation to personality. Affective responsiveness to external stimuli that would also include food cues was related to appetite through a higher eating rate. This finding could give new information on the classic externality theory implying that obese are more responsive to food stimuli. Results further showed that psychological stress overload can prompt eating, resulting in a higher eating rate.

Affective responsiveness was also related to greater effect of the satiety-enhancing drug sibutramine in experimental test meals, implying that patients with sensitivity to food cues benefited from the enhanced satiety. Results further revealed that psychological moderators related to wishes for being helped and adjustment to social expectations can affect results in experimental designs.

(Study III and IV)

Personality predictors of more weight loss in obesity treatments could be identified. These were related to physical or dependency needs for food. Such reasons for eating could be specifically altered by treatment interventions targeting hunger or eating habits, such as a satiety-enhancing drug or behaviour modification treatment.

Ego dysfunctions such as distortions in perception of reality predicted less weight loss. Such ego dysfunctions would constitute more profound difficulties in obesity behaviours. These patients could have difficulties managing the demands posed on the participants in a behaviour modification treatment.

(Study V and VI)

LIST OF PUBLICATIONS

The present thesis is based on the following papers, which will be referred to by their Roman numerals:

- I.** Elfhag, K., Carlsson, A.M. & Rössner, S.
Subgrouping in obesity based on Rorschach personality characteristics.
Scandinavian Journal of Psychology, 2003;44, 399-407.
- II.** Elfhag, K., Rössner, S. & Carlsson, A.M.
Degree of body weight in obesity and Rorschach personality aspects of mental distress.
Eating and Weight Disorders, In press.
- III.** Elfhag, K., Barkeling, B., Carlsson, A.M. & Rössner, S.
Microstructure of eating behavior associated with Rorschach characteristics in obesity.
Journal of Personality Assessment, 2003; 81, 40-50.
- IV.** Elfhag, K., Barkeling, B., Carlsson, A.M. & Rössner, S.
Food intake with an anti-obesity drug (sibutramine) versus placebo and Rorschach data: A crossover within subject study.
Journal of Personality Assessment, In Press.
- V.** Elfhag, K., Rössner, S., Carlsson, A.M. & Barkeling, B.
Sibutramine treatment in obesity: Predictors of weight-loss including Rorschach personality data.
Obesity Research, 2003; 11, In press.
- VI.** Elfhag, K., Rössner, S., Andersson, I. & Carlsson, A.M.
Rorschach personality predictors of weight loss with behavior modification in obesity treatment.
Journal of Personality Assessment. (Manuscript submitted for publication)

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STUDY I - VI

LIST OF ABBREVIATIONS

Afr	Affective ratio
An+Xy	Anatomy and X-ray
BDI	Beck Depression Inventory
BMI	Body Mass Index
CDI	Coping Deficit Index
COP	Cooperative movement
CS	(Rorschach) Comprehensive System
DEPI	Depression Index
EB style	Experience Balance style
EII	Ego Impairment Index
es	Experienced Stimulation
Fd	Food contents
FM	Animal movement
G	Gram
ICC	Intraclass correlation coefficient
m	Inanimate movement
MOR	Morbid contents
P	Populars
PTI	Perceptual Thinking Index
PureC	Pure Colour response
SAD	Seasonal Affective Disorder
SCZI	Schizophrenia Index
VIKTOR	VIKT moniTOR (WEIGHT moniTOR)
Vista	Dimensional shading
VLCD	Very Low Calorie Diet
WHR	Waist Hip Ratio
Wsum6	Weighted Sum of special scores
WSumC	Weighted Sum of Colour scores
X-%	Percent form quality minus
Y	Diffuse shading
κ	Kappa

1 BACKGROUND

1.1 OBESITY

1.1.1 An introduction to obesity

1.1.1.1 Definition of obesity

Obesity is a fast growing health problem in the Western world that has been classified as an epidemic according to the World Health Organization¹. Obesity is assessed by classifications of Body Mass Index (BMI) which is calculated as weight in kilograms divided by the squared height in meter. Obesity is defined as a BMI of at least 30 kg/m². This can be compared to the BMI range for normal weight, which is set at 18.5 to < 25 kg/m². The intermediate range from BMI 25 to < 30 kg/m² is referred to as preobese or overweight. Obesity can be further divided into class I (BMI 30 to < 35 kg/m²), class II (BMI 35 to < 40 kg/m²) and class III (BMI ≥ 40 kg/m²)¹. An additional important measure of obesity is waist circumference, which is a practical indicator of abdominal fat^{2,3}.

1.1.1.2 Consequences of obesity

Higher levels of body weight and body fat are associated with an increased risk for adverse medical consequence. The so-called metabolic syndrome is a cluster of symptoms including insulin resistance, type 2 diabetes, hypertension, and dyslipidaemia that is associated with obesity^{4,5}. There is also a heightened risk for other medical complications such as cardiovascular diseases, some types of cancer and stroke⁵, as well as mechanical problems and physical disturbances such as decreased reproductive function in women⁶.

The risk for medical co-morbidities is increased in the preobese, and moderate, severe and very severe in obesity class I, II and III respectively¹. Abdominal fat implies greater health risks than peripheral fat⁷, and waist circumference is an important complementary risk measure. A waist circumference > 102 cm for men and > 88 cm for women implies substantially increased risks for metabolic complications¹.

The world prevalence of obesity in adults is estimated to 7%⁸. In Sweden the prevalence has reached 10-15%⁹ and in the U.S. population 20 – 25% of the adult population are obese⁸. The consequences of obesity lead to high costs for society. It has been estimated that obesity accounts for 5.5 -7% of the national health expenditures in the United States and 2 – 3% in other countries for which estimates have been reported¹⁰. There are also indirect national costs due to obesity, such as changes in productivity¹¹.

1.1.1.3 Obesity as multiply determined

Biological, psychological, social and cultural factors in a complex interaction cause and maintain obesity. Genetic influences^{12,13} are suggested in parental obesity¹⁴, although biology alone is not sufficient to explain obesity¹⁵. The association between obesity and socio-economic factors is furthermore well known, as lower socio-economic^{16,17} and educational¹⁸ levels are associated with higher degrees of obesity. Weight also tends to increase with age, partly due to lifestyle changes^{19,20} although this age-related weight gain has been found to a larger as well as more limited extent^{17,21}. The primary causes for the increasing levels of body weight are attributed to environmental and behavioural changes, as the obesity epidemic has developed in a too short time span to make it possible to attribute the increasing body weights to genetic changes¹.

1.1.1.4 Understanding obesity behaviours

In its most simple terms, obesity is a consequence of a positive energy balance. Energy intake in the form of food and drink exceeds energy expenditure including resting metabolic rate and physical activity. The most important step in treating obesity is to establish a negative energy balance, which can be accomplished by means of reduced energy intake and increased energy expenditure. The core message in the weight loss advice is therefore: to reduce food intake, improve eating habits including food choices and the regularity of meal patterns, and to be more physically active. A more profound problem lies in understanding why this is so difficult for the patient to accomplish.

The obese patient referred to treatment usually wants to lose weight, but the self-reported motivation and readiness for weight loss has a poor relationship to later weight loss outcomes²². Furthermore, personnel in obesity programs encounter discrepancies between what a patient says and actually does²³. Such inconsistencies between deliberate intent and actual behaviour obviously pose problems in weight loss treatment, and also suggest a considerable complexity of underlying behaviours.

The discrepancies in self-reports and actual weight-related behaviours are further illuminated by problems in accurately perceiving and realizing the amount of food consumed, as well as the magnitude of physical activity performed. Research findings for obese samples have described underreporting of actual food intake by an average of 47%, and overreporting physical activity by an average of 51%²⁴.

A common clinical experience is furthermore that many patients cannot readily explain why they cannot resist from overeating and discontinue the consumption of fattening foods. It seems apparent that it can be difficult for many patients referred to obesity treatment to have awareness and insight into the mechanisms of their behaviour.

These examples illustrate some of the difficulties in obesity treatment and the need to better understand obesity behaviours. Considering the psychological mechanisms in human behaviour is obviously crucial in the study of obesity.

1.1.2 Being obese

A common use of psychology in obesity concerns highlighting the consequences of being obese. Quality of life is known to be lower in obese than in normal weight samples²⁵ and higher degrees of obesity are associated with more impaired quality of life^{26,27}. A common measure of quality of life is the SF-36 Health Survey²⁸. Aspects of quality of life according to the SF-36 that have been found impaired in higher degrees of body weights include physical functioning, implying that health and pain problems exert limitations on daily living and normal activities²⁷. Bodily pain problems are common in obesity, and increase with higher body weights. Such physical pains have been found to have particular importance in determining the overall quality of life in the obese²⁹.

According to several recent studies, the obese person is also characterized by a less positive mood state and more depression and anxiety^{25,30,31}. Indications of more severe depression and psychiatric morbidity are found in a subset of the obese. In addition, social interactions are less frequent among the obese compared to other clinical groups and handicaps for example, and overall self-reported problems are more common in women²⁵.

Being obese in our society also means encountering attitudes of non-acceptance from other people, and such negative attitudes and discrimination add to the difficulties this group has to face, and also lead to a social stigmatisation. Clear and consistent stigmatisation, and in some cases discrimination, has been described for the obese in areas of living such as employment, education, and health care³².

1.1.3 Eating behaviour and obesity

1.1.3.1 *Attempts to understand the development of obesity*

The common view is to consider depression to be a consequence of obesity. Some research studies support this hypothesis³³, although there may not be such an unequivocal or simple relationship between obesity and depression or anxiety³⁴⁻³⁶. Some results indicate that obesity could also be considered a consequence of depression³⁷. In DSM-IV³⁸ elevated appetite is today recognised as an indicator of depression, implying that depression can affect appetite and eating behaviour. Accordingly, in the second edition of one of the most widely used self-report measures on depression, the Beck Depression Inventory (BDI-II), the item on reduced appetite as a sign of depression has recently been altered to also include elevated eating³⁹.

The use of psychology in obesity research during the past few decades should be seen in a historical context. The earliest theories on obesity emanated from psychoanalytic theory, describing the cause for overeating could be found in the psychological functioning of the person. Research in the last decades of the 20th century has largely abandoned this perspective, and other theories evolved, of which the biological theories have received much attention. One reason for the decreased interest in the psychoanalytic theories of obesity was, besides new research findings in other areas, that the theories could contribute to stigmatisation. If obese people are held responsible

for their weight and thus could be considered able to control it, there are risks for stigmatising attitudes⁴⁰.

1.1.3.2 Early psychological hypotheses

The first theories attempting to explain overeating amongst the obese were based in a psychoanalytic framework, and started to appear around the 1950s⁴¹⁻⁴⁵. Hilde Bruch is the most well-known of the persons describing a psychology of obesity^{42,43}. The reasons for overeating were considered to have early origins in the patient's life. Being fed has been described as the baby's first source of gratification and tension relief, as well as interpersonal experience and communication with the world. Food becomes associated with parental care and love, and the satisfaction of hunger with the feeling of well-being and security⁴⁴. Food and eating can therefore have fundamental psychological importance in later life.

Various unconscious primitive motives and intra-psychic conflicts were also proposed in the psychoanalytic approach to eating^{41,42,46}. Overeating was meant to be an expression of unsatisfied sexual craving, lack of sublimation for oral libido, an early disturbed mother relationship, wishes to incorporate the object, destructive impulses, etcetera. A symbolic meaning in having an obese body has also been considered, and includes motives such as protection, avoidance of threatening life situations, strength and greatness in being big, and an unconscious expression of pregnancy. Obesity as a defence against more severe psychopathology such as psychosis has also been described⁴⁷.

It has furthermore been assumed that various internal states can be misinterpreted as hunger^{41,43}. Some parents respond indiscriminately to the child's variety of emotions by providing food. The adult that as a child experienced eating as the prime solution for many different internal states, was meant to be prone to revert to this well-known solution in a variety of situations⁴⁴. Eating becomes a reaction to emotional states that the person had not learned to either identify or handle in other ways.

Parts of the psychological explanations were later tested in experimental research. Eating as a reaction to anxiety and stress has been most studied. An association between stress and eating was found in some research⁴⁸. However, many studies showed obese persons' eating behaviour was not affected by experimentally induced anxiety and stress⁴⁹⁻⁵¹. Later research suggests that obese subjects increase their eating in response to unlabeled arousal⁵² and anxiety that is not controlled or explained^{53,54} rather than a general stressor.

1.1.3.3 The externality hypothesis

The next hypothesis to emerge was the externality theory, in the 1960s. The externality theory was based on findings that the obese seem prone to eat in response to various external stimuli that can elicit eating, rather than in response to biological hunger⁵⁵. This implied obese subjects seemed to have a sensitivity and reactivity to external cues affecting appetite and triggering eating. Among such external cues are time; overweight subjects were more influenced by manipulations of the passage of

time⁵⁶. Sight and number of food cues are other examples. Overweight subjects ate twice as many cashew nuts when light was brightly focused on the nuts as when the light was dimmed⁵⁷. When the lights were dimmed the overweight ate even fewer nuts than the lean controls. Quantity of food cues present also had a marked effect on obese but not on normal weight subjects⁵⁸. Taste is yet another of these “external” cues. Overweight persons were found to eat more if the food tasted good than if it did not, than the normal weight controls^{58,59}. Later research did not consistently replicate all of these findings. Rather, it became clear that people who were more prone to eat in response to external stimuli could be found in all weight categories. Furthermore, degree of external responsiveness showed no association with degree of body weight, which was expected if this had been a major reason for overeating⁶⁰.

1.1.3.4 The hypothesis of restraint

The restraint hypothesis is built on the presumption that some people try to restrain their eating to achieve or maintain a weight below their natural biological set point⁶¹. It was assumed that the obese could have a higher biological set point for their body weight, and that they therefore had to exert a greater conscious dietary restriction in order to control body weight. Laboratory studies showed that restrained eaters compared to unrestrained eaters tended to overeat after a preload of calorie intake when the conscious control to restrain food intake was assumed to have been broken, but ate less in a no-preload condition when the control was still operating⁶². Restraint was suggested as a problem in eating that could lead to weight increase, and this theory was becoming popular in the 1980s.

However, cognitive restraint has later been shown to be higher among normal weights compared to the obese. Overweight and obese instead have more disinhibited eating and higher hunger scores⁶³. Furthermore, restraint in eating tends to increase with successful weight loss in behaviour modification treatments^{64,65}.

1.1.4 Eating disorders in obesity

1.1.4.1 Binge eating

Binge eating as a more pronounced problem in obese eating behaviour has been recognized in the last few decades⁶⁶. More recently, Binge Eating Disorder (BED) has been a proposed diagnostic category in the DSM-IV³⁸, although still not a formal diagnosis. BED is defined as recurrent episodes of consumption of large amounts of food accompanied by a sense of lack of control over eating. BED also implies experiencing distress about the binge eating. Additional criteria that can be related to the binges are eating faster than usual, eating until uncomfortably full, eating when not physically hungry, eating alone and having negative feelings after overeating.

Depression and anxiety are found to be more common in obese patients with binge eating than in obese without such an eating disorder⁶⁷. Elevated levels of psychiatric disorders among binge eaters are reported in several⁶⁸ but not all⁶⁹ studies. Furthermore, bodily concerns such as perceiving oneself as more overweight and

feeling fatter, body dissatisfaction, and more preoccupation with weight and greater drive for thinness also characterize binge eaters^{70,71}. Psychological antecedents that can trigger a binge episode include negative emotions and feelings of anger, worries, emptiness and hopelessness⁷².

The suggested diagnosis Binge Eating Disorder that has been largely adopted as a research criterion requires binges twice a week. However, binge eating may be more realistically understood as a continuum in obesity, and using modified criteria can have a higher clinical relevance⁷³. The prevalence of a full BED in obese clinical samples is reported to 11-13%, whereas “subthreshold BED” or “partial criteria BED” in the corresponding samples, mainly implying changing the binge eating criteria to once instead of twice a week suggests instead a prevalence of 18- 25%^{71,73,74}. It has been shown that binge eating once a week does not differ from binge eating twice a week in terms of clinical characteristics or psychiatric distress⁷⁵.

BED patients usually respond well to a variety of different obesity treatment programs⁷⁶, including pharmacological treatments^{67,77}. BED patients also have a noteworthy high placebo responsiveness⁷⁶.

1.1.4.2 Night eating

The Night Eating Syndrome (NES) comprises skipping breakfast, consuming most food in the late evening and at night, and insomnia associated with either falling or staying asleep⁷⁸. According to some research results, NES has been reported to be more common in the most severely obese subjects and among men⁷⁹, whereas other studies have found no such differences⁸⁰. NES is further characterized by depression and lower self-esteem⁸¹, and is more common during periods of stress^{81,82}. Biological disturbances in the stress-affected hypothalamic–pituitary-adrenal (HPA) axis have also been shown in NES⁷⁸. Weight reduction in obesity programs is poorer for patients with NES⁸³, but relaxation techniques designed to reduce stress has shown positive treatment results⁸⁴.

Despite similarities such as depression, BED and NES has shown little overlap⁸³. The prevalence of NES in clinical samples has been estimated to around 6-16 %^{80,83}. In Sweden the prevalence can be lower than in other countries because of cultural differences with an earlier dinner time⁸⁰.

1.1.4.3 Nocturnal eating

Nocturnal eating is a more severe eating disturbance than NES and implies awakening from sleep to eat⁸⁵. Nocturnal eating has sometimes been treated as a subset of NES, but should more correctly be considered to represent a separate syndrome⁸⁰. Nocturnal eating is more precisely defined as frequent and recurrent awakenings to eat and normal sleep onset following the ingestion of the desired food, as described in the international classification of sleep disorders⁸⁶.

Nocturnal eating has been found to occur in 8-10 % of obese patients^{80,87} and in 6% of sleep disorder patients⁸⁸. In obese patients, a potential psychosocial stressor such as

long-term sick leave has been associated with nocturnal eating. BMI, age and gender did not differ for these patients when compared to the obese without nocturnal eating⁸⁰.

1.1.5 Treatment of obesity

1.1.5.1 Treatment methods

Common treatment alternatives in obesity management are diet and exercise behavioural modification programs, VLCD (Very Low Calorie Diet), anti-obesity drug therapy and bariatric surgery. Behaviour modification programs are based on restriction of calories and increased physical activity. Behavioural interventions targeting eating behaviour, cognitions and feelings that are related to food and eating, and self-monitoring of behaviours are integrated parts of such programs. Regularly weighting oneself and registering the result is an example of self-monitoring, as is recording food intake for several days. The training of self-control and the handling of situations implying risks for overeating are also important⁸⁹⁻⁹¹.

VLCD is a diet containing little energy, but enough of other essential nutrients including proteins. The VLCD can be used as the sole nutriment for a prolonged period for up to about three months, and thereafter as a partial nutriment besides the food that is gradually increased⁹². Recently there is a trend towards prescribing a somewhat higher daily energy intake as LCD (Low Calorie Diet).

Many different substances have been tested in pharmacological treatments of obesity. Today there are mainly two drugs on the market, sibutramine and orlistat. Sibutramine is a serotonin and noradrenaline reuptake inhibitor (SNRI-drug) that acts through the central nervous system. These central mechanisms primarily enhance satiety⁹³. Orlistat rather works locally, as a gastrointestinal lipase inhibitor that reduces dietary fat absorption⁹⁴.

Gastric surgery includes techniques such as vertical banded gastroplasty and gastric banding. In these techniques a reduction of the stomach that can only contain a very small amount of food is constructed. This will reduce food intake radically by necessity, possibly also by the addition of an earlier release of gastric intestinal peptides affecting the appetite regulation^{95,96}.

1.1.5.2 Treatment outcome

Obesity is difficult to treat and the long-term weight loss outcome is generally modest in various types of treatment programs^{97,98}. The weight loss achieved during treatment is often regained.

Weight loss results remain difficult to predict in spite of a growing amount of research. Some general predictors which have been repeatedly identified and are agreed upon include pre-treatment weights, initial weight loss and attrition⁹⁹. In the research on psychology and treatment outcome in obesity, many factors have been suggested but to date, there are no consistent or agreed-upon results. Stable psychological correlates of weight loss could, for example, not be identified in reviews of the literature^{100,101}. A

behavioural factor such as self-monitoring has, however, been shown to promote weight loss¹⁰².

Most likely, different persons benefit from different kinds of treatment approaches. The identification of factors enabling a better match of the obese person to a particular treatment would be essential for cost-effectiveness and for avoiding the negative psychological consequences of failure in treatment^{103,104}. More understanding of the prospect for successful weight loss results to be anticipated for the patient is valuable in clinical practice. Psychological variations including features related to eating behaviour and the ability to accomplish changes could provide more information to be taken into account.

1.2 PERSONALITY

1.2.1 What is personality?

1.2.1.1 Definition of personality

The word personality is derived from the Latin “persona” which means mask, role or character. The word persona was originally used for the mask worn by the actors in ancient Greek dramas. Eventually persona also came to encompass the character role as well as the mask. The first meaning of the term personality was accordingly a public personality displayed to others¹⁰⁵.

In psychology there is not a single definition of personality, but attempts have been made to summarize the most important components in the use of this term across different personality theories. Such a suggestion of a common definition of personality is “*consistent behaviour patterns and intrapersonal processes originating within the individual*”¹⁰⁶. There are two important parts of this concept that should be noted. The first is that personality concerns behaviours and internal processes that are *consistent* for the person over time and across situations. That is, personality exists independent of situations and is not merely a reaction to a situation. Personality implies that there is some kind of stability in the person’s characteristics. It does not, however, mean that situation does not affect the person or that personality cannot change.

The second part of this concept of personality concerns the *intrapersonal processes*. This refers to the emotional, cognitive and motivational processes going on *inside* the person, that affect behaviours, reactions and feelings. Intrapersonal processes are distinguished from interpersonal processes that rather refer to what is going on *between* persons.

The individual *differences* are also stressed or implied in the definition of personality, as the uniqueness of every person is indicated¹⁰⁵.

Most definitions of personality further consider personality as some hypothetical *structure* or *organization*, with behaviours seen as being organized by the personality¹⁰⁵. *Personality structure* includes the dispositions to conduct oneself in certain ways that constitute the *traits*, and the current thoughts and feelings that

constitute personality *states*¹⁰⁷. Personality traits are the relatively stable characteristics of the person. Personality states are the transitory affects and reactions in a situation. Personality states obviously depend on the person's personality traits.

1.2.1.2 Personality theories

There are several different theories in the study of personality that adhere personality in different ways. Some of the major approaches to personality are psychoanalytic theory, neo-Freudian theories, trait theories, biological theories, and behavioural and cognitive theories^{106,108}. The psychoanalytic theory is concerned with the processes of the unconscious mind and psychic energy that is considered important for understanding behaviour. Trait theories describe how people differ from one another on a continuum of various personality characteristics, and how these differences can be conceptualised and measured. Biological theories are focused on the inherited biological differences and biological influences on personality. Behavioural theories are concerned with overt behaviour, and cognitive theories with the ways in which people process information.

1.2.2 Trait theories

1.2.2.1 Basic assumptions

Trait theories on personality have some general assumptions in common. A trait is considered to be a dimension of personality that persons can be categorized along. Such traits can also be described as personality characteristics. In agreement with the definition of personality, traits are considered to be relatively stable over time and over situations¹⁰⁶.

Trait theorists primarily focus on describing personality of relevance for behaviour, and predicting behaviour. In the explanatory analysis, however, the psychological mechanisms behind the behaviours of persons high or low on personality characteristics are also elaborated¹⁰⁶. The trait concept has during later years been broadened to also include nonobservable behaviour such as emotions, motives and attitudes¹⁰⁹.

1.2.2.2 Specific trait theories

Although trait theory can be considered as a general approach in personality psychology, it also includes some more specific approaches.

Allport, being the first trait psychologist claimed traits are based in the central nervous system. He made a hierarchical description of traits, covering cardinal traits that most pervasively characterize a person, central traits that describe behaviour in a more limited range of situations than cardinal traits, and secondary dispositions that are less consistent¹¹⁰.

Eysenck suggested basic dimensions, called superfactors that underlie other traits. The superfactors were introversion-extraversion and neuroticism and psychoticism. Extraverts and introverts have been found to differ among a variety of behaviours and

responses to various situations, and Eysenck linked this dimension to biological predispositions ¹¹¹.

Catell derived five factors of personality through an atheoretical factor analytical approach. This factor analytic trait scale contains neuroticism, extraversion, openness, agreeableness and conscientiousness. Each of these factors then includes certain personality characteristics. In deriving this factor analytic pattern Catell was careful to avoid the pitfalls by only including information from questionnaires, and also included other types of data like observations ¹¹².

1.2.2.3 A trait approach in personality research

A trait approach to personality is the most common among personality researchers in academic science ¹⁰⁶. The articles in scientific journals of personality commonly include trait measures, that is, individual differences on trait continuums are studied. The relatively stable characteristics of a person that have relevance for behaviour and responses to a variety of real life situations, and can be measured, are of particular interest for the researcher in personality.

As trait descriptions place people along a continuum, the trait approach facilitates comparisons to use in research. Persons usually vary on traits in such a way that they can be categorized along a continuum that resembles a normal distribution, providing prerequisites for statistical analyses.

The magnitude of the relationship that can be attained between a single personality trait score and measures of behaviour are usually at the most a correlation of .30 or perhaps sometimes .40 ¹⁰⁶. Such a relationship implies around 10% of the behaviour can be explained by personality. Thus, although statistically significant relationships are found in personality research, several other factors besides personality also contribute to account for behaviour. The limited variance that can be explained by personality has also been taken into account for the importance of situational determinants ¹⁰⁸.

A statistical consideration often emphasized in personality research is that of effect size ¹⁰⁸. Effect sizes are used in an attempt to distinguish statistical significance from importance. The correlation coefficient is an easily derived measure of effect size and is considered to give more meaningful information than a significance level. A statistically significant result cannot be equalized as important, as it depends on how many persons have been included in the sample. Therefore, the effect size, such as the correlation coefficient, is emphasised as a measure of the relevance of the association found.

1.2.2.4 Liabilities of trait theory

It has been argued that trait theories are too concerned with the surface personality ¹¹³. A related criticism is the implicit assumption that people can report accurately about themselves ¹⁰⁹.

The models of Eysenck and Catell can be further questioned as to their simplification. Many aspects of personality seem to have been left out of such models assuming three

or five personality dimensions¹⁰⁹. There seems to be more to personality than what is apparent in the models of a certain number of dimensions. It has been argued that neglected parts of the personality in these theories include self-concept, cognitive styles, and the unconscious¹¹⁴. The lack of a common theoretical framework that can tie all trait theories together has also been regarded as a weakness¹⁰⁶.

It has also been claimed that the situation exerts a greater effect on behaviour than personality, and this has been used as a critique of the trait approach¹¹⁵. Today a common assumption among psychologists is that the situation and the personality interact to determine behaviour¹¹⁶.

1.2.3 The psychological unconscious

1.2.3.1 The psychoanalytic theory

The assumption of psychological processes and aspects that are not conscious is essential in many psychological theories. Personality theorists from most personality approaches acknowledge that thoughts outside awareness are important for determining behaviour¹⁰⁶. Freudian psychologists are the ones who place the most emphasis on the unconscious processes.

The notion of people having an unconscious, a part of themselves to which they do not have conscious access, and that yet influences their actions and lives profoundly, was first systematically introduced by Freud over a century ago. The notion of an unconscious was shocking at the time, and was received with critique, protests and ridicule. However, Freud's work was soon to become the most influential theory in psychology ever¹¹⁷, and is referred to as the psychoanalytic theory. Many of the later psychodynamic theories emanate from and include basic assumptions of the psychoanalytic theory¹⁰⁶.

Originating from Freud's first so-called topographic hypothesis, the psychic phenomena were divided into the Unconscious, Preconscious and Conscious. The Conscious refers to thoughts, feelings and sensations that are in focus in the current psychic sphere of the person. The Preconscious refers to psychic content that the person can attain consciousness about, although with some effort. The Unconscious refers to psychic functions or processes that are not within the conscious awareness. According to Freud's complementary structural model, the psychic life can be further described as divided into the Id, the Ego, and the Superego. The Id represents the most primitive and basic aspects of human life that are referred to as drives. The Id is totally unconscious. The Ego and the Superego are partly conscious, partly unconscious. The functions of the Ego include thinking, intelligence, achievements and reality testing. The Superego refers to moral, conscience, and also to more archaic notions about punishment and reward¹¹⁷.

1.2.3.2 Popular notions of the unconscious

The unconscious processes are given a fundamental importance for understanding human behaviours in the psychoanalytic theory. One example that has reached common

popularity is the “Freudian slip”¹⁰⁶. This means that a word that not consciously intended to be said is yet used, and this word emanates from psychic processes that can be unconscious or preconscious and was not intended to be let out, for example, something conflicted, wished, or disguised. The similarity of words, like similar first letters, did let the Freudian slip pass the conscious guarding, that is, the function of the Ego.

Forgetting about a meeting or appointment that is imbedded with some conflict and has therefore been ruled out of consciousness is another example. Dreaming during the sleep is also an illustration of psychic activities that we are ordinarily not conscious about.

1.2.3.3 Experimental research on the unconscious

The existence of unconscious cognitive processes has been demonstrated in experimental research. Through a vast series of experiments it has been shown that there may be little and sometimes no introspective awareness to cognitive processes, and that self-insight and accuracy of self-reported motives for behaviour are poor¹¹⁸.

The assumptions of unconscious processes are integrated parts in many psychological areas and are confirmed in research on for example cognitive functions, subliminal perception and implicit memory, procedural knowledge, dissociation and also in research on neuropsychology and psychopathology¹¹⁹. Assumptions on a mental life outside awareness can be considered as rather unequivocal. Although the existence of unconscious processes is repeatedly identified, they do, however, not precisely test and confirm assumptions from the psychoanalytic theories on the nature of the unconscious mental life¹¹⁹. Based on studies including cognitively related research, some conclusions are that the initial stage of human information processing is outside of consciousness, is psychological in nature, is active in its effect on consciousness, and operates on principles that are qualitatively different from those governing conscious cognition¹²⁰.

1.2.4 Sources of data in the study of personality

Data to be collected about personality can be divided into different types. A common way of dividing and categorizing data includes life outcome data, asking others, asking the person and watching what the person does^{108,109}.

1.2.4.1 Life record data: L-data

Life record data are quite concrete and easy verifiable. Such data include what would be called sociodemography such as being married, employed and also questions like having been hospitalised, having had diseases etc. This can be asked directly, or it can be obtained from archival records. Life outcome data are usually of great importance for a medical researcher, and a scientific goal is usually to be able to predict life outcomes.

L-data can sometimes give psychological information. A certain amount of conscientiousness, for example, is needed in order to graduate from school or hold a job. At other times, however, these kinds of data give very little information about psychological aspects as they are affected by numerous other factors.

1.2.4.2 Observer data: O-data

Asking other people who can be considered as knowledgeable observers of a person gives O-data. Examples are in the study of children when parents, teachers and friends can be asked to rate the child on various features. Sometimes researchers are trained to gather this type of data themselves. An advantage of O-data is that they have a real life basis. O-data are, however, judgements derived by someone observing a person in a certain context, and are as such marred by human errors. Human errors include the bias in reporting due to who makes the observation. A disadvantage is also the limited amount of information the observer can provide, and the fact that what is observed in one situation may not be possible to generalize to other situations.

O-data have sometimes alternatively been called I-data where I stands for Informant.

1.2.4.3 Asking the person directly: S-data

Asking the person gives self-judgements and derives so-called S-data on various features such as dominance or friendliness. The principle behind S-data is that the person can give all relevant information about personality directly. These types of data are uncomplicated as there are no interpretations made. The data can contain pre-determined categories for answering questions about oneself, or more open-ended questions. Asking the person directly is by far the most common basis for gathering personality data. The greatest advantage is that this type of data is the easiest and most inexpensive way to collect information from large samples of people. Another advantage is that the person has the unique perspective of being himself or herself, and that a part of mental life that is invisible to others is visible to the person.

Limitations include that only the data the person is willing to tell about can be assessed, and giving alternative answers when unwilling to reveal the true one will give misleading information. Another limitation is that the person may be incapable of giving accurate data even if he or she was willing to do so, because of lack of insight, faulty or unrealistic self-perception, failure of memory, repression and also the “fish and water effect”¹²¹. The latter term implies that we become so used with the way in which we usually react and behave, that it is no longer recognised as specific but rather becomes invisible.

1.2.4.4 Watching what the person does: T-data

Watching what the person does represents a final tactic in learning about someone. The person can be watched in a laboratory experiment or in a real life setting, although T stands for Test-data. T-data can also be derived from some kinds of personality tests. Performance-based personality tests such as the Rorschach method are included among

these techniques. Personality tests containing self-report questions have sometimes also been considered as data in this category if the questions are not direct, but personality rather inferred from the answers¹⁰⁸. The MMPI (Minnesota Multiphasic Personality Inventory) is suggested as an example. An implication of this sort of data is that the person has not direct access to what aspects of personality that are measured through the observable behaviour. The data collection includes the presentation of some stimuli and observing and recording the person's reactions to these stimuli.

Advantages include that these data can be more realistic and they can give information on behaviours that are ordinarily hidden, but elicited in an experiment or through the answers to a stimuli such as an inkblot.

The greatest disadvantage in collecting personality information through observing what a person does is the considerable expense. Another disadvantage concerns the fact that the data appearances can be ambiguous and have to be interpreted. One cannot know what a bit of data derived from watching the person means and measures psychologically just by looking at it. They rarely measure what they would superficially appear to measure, as this is the most trivial operational level. For example, the number of phone calls a person makes during the day, the time in minute and seconds a child can wait for a gratification, or a description of an inkblot, all have to be interpreted into something else than the data *per se* to give meaningful information about personality.

1.2.4.5 Concluding comment on different kinds of data

Various types of data have thus advantages as well as disadvantages. Almost all types of data have been criticised and seem to have been rejected at some point in time, including self-report questionnaires, demographic data, "projective" personality material and laboratory methods. As they are all to some extent incomplete, this suggests the use of all the sources of data are required to give more full information in a research area. Different advantages and disadvantages can then compensate for one another¹⁰⁸.

1.2.5 Personality and obesity

1.2.5.1 Minnesota Multiphasic Personality Inventory

In the research on personality in obesity, the self-report inventory the Minnesota Multiphasic Personality Inventory (MMPI or MMPI-2)¹²² is the method that has been most frequently used. These studies report personality aberrations to a varying extent, and results often include elevation in depression¹²³⁻¹²⁷. Besides the results on depression, the MMPI and MMPI-2 research reports elevations in other scales in describing and subdividing obese subjects. These results includes varying combinations of elevations on the Hypochondria, Psychastenia, Schizophrenia, Social Introversion and Hysteria scales^{124,125,127-130}.

The MMPI research has generally concluded there is a considerable heterogeneity in obese samples. An example of subgroups described include patients characterized by

psychopathology, some aberration such as mild depression and normal or even “hypernormal” patients free from distress or anxiety, respectively ¹³⁰. Others have likewise suggested cluster profiles ranging from normal to psychopathology to a smaller or larger extent ¹²⁸.

Another study has described MMPI profiles for the obese as similar to those for eating disorder samples. These results were interpreted as reflecting a common core disturbance for these patient groups, including immaturity, passive-aggressive traits and self-defeating struggles for interpersonal control ¹³¹. Related interpretations of similarities between MMPI results for obese and eating disorder samples likewise suggest conflicts about dependency and self-assertion, and a possible underlying personality disorder such as dependent personality ¹²⁶. Yet others have suggested that MMPI profiles of an obese sample have similarities to addictive populations such as alcoholics ¹³².

The data from MMPI have generally given little or no predictive information about subsequent weight loss ^{124,130}, although some findings have been reported, such as inordinate concern with health predicting poorer treatment outcome in bariatric surgery ¹²⁷. Another study found that obese patients who elected bariatric surgery to treat their obesity had higher levels of stress and lower levels of adaptive functioning compared to equally obese patients who elected not to undergo a surgical procedure ¹³³.

1.2.5.2 Karolinska Scales of Personality

With the Swedish personality inventory Karolinska Scales of Personality (KSP) ¹³⁴, higher scores in the scales Somatic anxiety, Muscular tension, Impulsiveness and Monotony avoidance, and lower scores in Socialisation in obese subjects as compared to control groups were found. These results were interpreted as an impulsiveness syndrome characterized by irresponsibility and mental instability, and were further compared to alcohol and drug addicts ^{65,135}. Others using the KSP report higher scores in the scales Muscular tension, Somatic anxiety and Suspiciousness. This KSP profile was furthermore similar to the ones found for bulimics and alcoholics, and the possibility of similar personality factors being associated with excessive eating and drinking have been discussed ¹³⁶.

According to a KSP study related to treatment outcome, scores of Anxiety, Monotony Avoidance and Suspiciousness were negatively related to weight loss maintenance, and Socialisation positively related to weight loss maintenance ¹³⁷. Others have, however, concluded that the personality traits measured by KSP did not appear to be important predictors of weight loss or relapse in obesity treatment ¹³⁸. The tendencies found in this study did, however, correspond to those in the earlier KSP study on weight loss maintenance.

1.2.5.3 Eysenck Personality Questionnaire

Using still another personality inventory, the Eysenck Personality Questionnaire (EPQ) ¹³⁹, extraversion has been found to be more pronounced in obese compared to normal-weights in a female population sample, when allowance was made for age and

social class¹⁴⁰. Others using the EPQ in a normal population sample have rather found reduced extraversion but increased neuroticism in higher degrees of BMI in women. Among men, increasing body weight was associated with increased extraversion and psychoticism¹⁴¹. The relationship was, however, weak. The EPQ scores had no significant relationship with weight changes in a population sample during a six-year period³⁷.

1.2.6 Performance based techniques for personality assessment

Self-report questionnaires are, as earlier described, the most common type of assessment method in personality research^{108,109}. Another type of personality assessment techniques can be referred to as performance based techniques, earlier mostly known as so-called projective techniques.

One quite classical technique that has been used for several decades is the Thematic Apperception Test (TAT)¹⁴². TAT consists of a series of pictures that mainly show persons, one, two or more in a variety of situations. In the test procedure, the person taking the test is asked to tell a story related to the content of the picture; what is going on right there, what has happened before and how it will end. The answers can give information on how the tested person experiences various situations, and interpersonal situations, emotional responses, psychological defences etcetera. A corresponding test for children is the Children Apprehension test (CAT), which consists of pictures showing animals in various human situations of significance for the child¹⁴³.

The Object Relations Technique (ORT)¹⁴⁴ is a series of pictures mainly on persons that are more ambiguous than the TAT. In the ORT some pictures are very vague just showing faint silhouettes of persons. The theoretical framework for the ORT emphasises the internalised object relations of the person that are assumed to be displayed in the stories created by the person taking the test.

Another type of performance-based tests is the percept genetic techniques such as the Defence Mechanism Test (DMT)¹⁴⁵. The DMT consist of a so-called tachioscope where threatening pictures are displayed very briefly. This is supposed to activate various defence mechanisms that can be inferred by interpreting the picture perceived by the person being tested.

Drawing tests are yet another type of techniques. Machovers draw-a-person test is quite well known¹⁴⁶. The person tested is asked to draw a person and this drawing is interpreted concerning various features such as the placement, size and line quality of the figure that is suggested to give psychological information on the person. Another example is the House Tree Person technique (HTP)¹⁴⁷. The person being tested is asked to draw a house, a tree and a person. These three themes are meant to evoke psychological aspects related to various areas of the person's life that can be interpreted from the drawings.

The by far most widely spread of the performance based personality assessment technique is, however, the Rorschach method^{148,149}.

1.3 THE RORSCHACH

1.3.1 The Rorschach method

1.3.1.1 Description of the Rorschach test

The Rorschach or “ink-blot” method^{148,149} is a technique for personality assessment. The Rorschach consists of 10 different cards with ambiguous, symmetrical perceptual stimulus, known as “ink blots”. Some cards have colours, some have only achromatic colours and the blots involve shading to different extents.

The Rorschach is administered according to a standard procedure. The cards always come in the same order, followed by the question “What might this be?” In solving the task of interpreting what the percept might look like, the person being tested has to rely on inner experience. Perceptual, cognitive and emotional aspects of personality are activated in this process, and hence reflected in the answers.

After the response phase there is the inquiry where the person taking the test is asked to show where the answer is found on the card, and what there is there that makes it look like that to him or her. A location sheet consisting of a page with the blots reproduced in miniature is also used for marking the area of the response.

Each response is recorded and later coded according to a standardized procedure taking several features of the answer into account. Using these codes, the Structural Summary consisting of several ratios, percentages and numerical derivations can then be completed. The Rorschach gives information on personality including affects, cognitions, self-perception and interpersonal aspects. By using the Rorschach, information about implicit motives and underlying personality characteristics can be attained^{150,151}.

The Rorschach has a long tradition as a psychodiagnostic instrument, and is the most commonly used performance based technique. It is often used in psychiatric settings when a more thorough understanding of personality functioning is needed. The prevailing method for analysing results is the Comprehensive System (CS), developed by Exner and his co-workers in the last three decades^{152,153}.

An assessment method such as the Rorschach that does not rely on self-reported information is referred to as an indirect or performance based technique. Referring to different types of personality data described previously, the Rorschach would further be described as T-data, which is contrasted to self-report data in psychological assessment^{108,109}.

The Rorschach has earlier mostly been described as a so-called projective technique. The concept of projection emanates from Freud’s theories on projection as an ego defence, implying internal threats and conflicts are projected upon the external world, to make them easier to handle. A concept of projection applied to projective techniques, was that people are influenced by their needs, interests and overall psychological organization in the cognitive translation and interpretation of ambiguous stimulus fields, such as the projective test material¹¹³.

1.3.2 History and development of the Rorschach technique

1.3.2.1 *Early use of Inkblots*

The history and development of the Rorschach technique can be summarized based on the work of John E Exner ¹⁴⁹:

Attempts to use inkblots as a psychological test actually started already in the 19th century. Around 1895, Binet and Henri tried to incorporate inkblots in their construction of an intelligence test, as they thought useful information on imagination could be derived ¹⁵⁴. Several other attempts were made to use inkblots for the study of imagination and creativeness ¹⁵⁵⁻¹⁶².

Inkblots were also used in the quite popular game Klecksographie (Blotto game). Children as well as adults played the Klecksographie in parts of Europe. Inkblots (Klecks) could be purchased, or the players could produce them for the game. The game came in many different forms. The players could create poem-like associations to the blots, or they could compete in developing elaborate descriptions to the blots ¹⁴⁹.

1.3.2.2 *Herman Rorschach as an artist and psychiatrist*

Herman Rorschach was born in Switzerland in 1884. As a child, he often played the popular Klecksographie game. He seemed to have been so fond of this game that he even got the nickname “Klex” during the later years in school. His father was an artist and Rorschach showed great artistic skills himself, working with pencil sketching as well as watercolours throughout his life.

Hermann Rorschach became a psychiatrist. It is assumed that his use of the inkblots to detect and describe individual characteristics in a more systematic way was influenced by some experiences in adulthood, besides his early fascination for the Klecksographie. At the mental hospital where Rorschach held a position school pupils who used to sing for the patients were also allowed to play the Klecksographie, as it seemed to make the pupils easier to handle. Rorschach noted that the gifted pupils produced answers with more fantasy than the less gifted pupils. In the psychiatric work at this time, the importance of differentiating schizophrenia from other types of psychosis was furthermore essential. Rorschach happened to note that the patients diagnosed with schizophrenia gave very different kind of responses to the Klecksographie game.

1.3.2.3 *Psychodiagnostik*

Rorschach’s assumption was that individual characteristics would be revealed in giving answers to what the inkblots might be. Rorschach developed several inkblots for his experiment. In pursuing his experiment, Rorschach could conclude that the method was of clinical use. Using the cards could enhance the diagnosing of schizophrenia, and in particular movement and colour responses appeared to give distinctive psychological information.

In 1921 the final manuscript Psychodiagnostik was published, initially by the house of Bircher ¹⁴⁸, along with ten of the cards that had been accepted for printing. In reproducing these, the printing process by mistake resulted in much more contrasts in the tones than in the original. This created shading features of the blots that were later to become an important source of information for answers

related to anxiety, although Rorschach at the time was not happy with these changes.

The set of codes provided in Psychodiagnostik are basically some of the core codes still in use, considering location of the answer, the use of the perceptual features for reporting colour or movement, and various contents. The intention of Rorschach was to further develop his technique. Disappointingly, Psychodiagnostik was received with little interest, and it was a financial disaster for the publisher, as only a few copies were sold.

One year after the publishing of Psychodiagnostik, in April 1922, Rorschach was admitted to the hospital with acute abdominal pains. He had acute peritonitis and died the next morning, at the age of 37.

1.3.2.4 The survival of the Rorschach technique

The development of the Rorschach was now to be spread along several pathways throughout Europe and America, and many persons and events came to influence the proceedings. As the House of Bircher entered bankruptcy, Psychodiagnostik and the ten cards was rescued by the publishing house Verlag Hans Huber. The colleagues of Rorschach continued the use of the technique. There was foremost an interest in interpreting the contents within the framework of the now increasingly popular Freudian theory, although content had been little emphasized by Rorschach himself. Emil Oberholzer, one of Rorschach's colleagues and friends, finished a paper Rorschach had been preparing, adding Shading and Popular answers to the system, and had the paper published¹⁶³. The American psychiatrist David Levy came to study with Oberholzer in Switzerland for one year, and when returning to the United States brought the technique with him. In the mid-1920s the Rorschach was thus planted in the United States.

1.3.2.5 The development of the first three Rorschach systems

Levy, being the bearer of the Rorschach seed in America, became a staff psychiatrist in New York. Samuel Beck was a student at this New York institute. Beck came to learn about Rorschach's work through Levy. Beck was fascinated by the Rorschach and in 1929 he initiated the first systematic investigation of the test after Rorschach's death. During three years Beck collected and analysed his material. His work was to become of fundamental importance for the Rorschach development during several decades. The psychology graduate Marguerite Hertz, having visited Beck in New York, had also realized the potentials of the technique and started her own investigation in Cleveland. Two doctoral dissertations on the Rorschach were hence completed in 1932, one by Beck and one by Hertz. Beck also published several articles describing the potentials of the test for studying personality organization and individual differences, and in the mid -1930s a considerable interest in the Rorschach technique had been evoked in the United States.

In Europe there was increasingly political chaos at the time, which would also come to influence the development of the Rorschach. Many of the persons who were to make important contributions to the Rorschach method left Europe for the United States. In Europe there was to be a less systematic development of the Rorschach method. Instead, it was common to use the Rorschach in more or less subjective ways, interpreting the answers from the dominating psychoanalytic and psychodynamic theories.

Bruno Klopfer was a psychoanalyst grounded in Freudian and Jungian theories, who came to work close to Carl Jung at an institute using psychological testing for employment in Zurich. The Rorschach test was incorporated in the battery of tests routinely used, that Klopfer came to work with. In 1934 Klopfer was offered a position at Columbia University and immigrated to the United States. Klopfer started teaching the Rorschach and in doing so, the incompleteness of Rorschach's work became apparent to him. The guidelines for coding were insufficient and there was a lack of differentiation of codes. Klopfer began to develop the technique. Klopfer also realized the importance of communicating the proceedings, and started a newsletter in 1936, called The Rorschach Research Exchange, later to become the Journal of Projective Techniques, and ultimately one of the leading journals on personality, the Journal of Personality Assessment.

Various views on how to work with the Rorschach were now to emerge. Klopfer proceeded with his work extending the system¹⁶⁴. Beck, who had gone to Europe to learn more about the technique, reacted critically to the subjective way of using the test in Europe¹⁶⁵, and strived for some more fixed standards. This led to a deep schism between Beck and Klopfer. Herz made some attempts to mediate between Beck and Klopfer, but with no luck, and each instead came to develop their own version of the Rorschach method. Around the 1950s, Beck published a volume series with his view¹⁶⁶⁻¹⁶⁸, and Klopfer and colleagues published theirs¹⁶⁹⁻¹⁷¹. Herz was very productive and among other works published a guideline for scoring the form quality of the answers¹⁷². Three separate Rorschach systems were now flourishing independently.

1.3.2.6 And yet three more Rorschach systems

Zygmunt Piotrowski, receiving training by Klopfer was a psychologist in the field of neuropsychiatry and experimental psychology. He was interested in the information the Rorschach test could derive for neurologically related problems, especially considering perceptual aspects. In 1957 Piotrowski published *Perceptanalysis*¹⁷³, and the fourth Rorschach approach was a fact.

David Rapaport, also from Europe, had a psychoanalytic orientation and was interested in the process of thinking and the functions of the ego. Rapaport organized a project to study the efficacy of several psychological tests, including the Rorschach, in order to derive a broad psychological description¹⁷⁴. Rapaport's work formed the fifth Rorschach system.

In Europe during this time, most of the Rorschach literature appeared in journals. In 1957, however, Ewald Bohm published his textbook and manual¹⁷⁵. Bohm was close to Rorschach's original concepts, and also incorporated some of the work of Beck, Hertz, Klopfer and Piotrowski, but mainly created a new, sixth Rorschach system that was to become widespread in Europe.

Despite the many ways in which the Rorschach approaches differed, the Rorschach method was commonly regarded as one method, and it became the most important method for psychodiagnosis throughout America and larger parts of Europe.

1.3.3 The Rorschach Comprehensive System

In the 1960s John Exner initiated a comparative analysis of the various Rorschach approaches¹⁷⁶. Because of the problems and liabilities that became

apparent through Exners investigations with the use of the Rorschach, the aim was to incorporate parts of each system to a new integration. The attempt was to select only those variables for which empirically defensible data could be shown by existing research data, or established by new research. Of the body of published Rorschach research those articles regarded to have sufficient quality concerning methodology and data analysis were further used. Exner also initiated numerous new studies for validation of variables, also collecting a protocol pool. Intercoder reliability was calculated and only those variables for which a satisfactory interrater reliability could be established were kept in the new system. Administration procedures like instructions and inquiry were also addressed, and from the growing data pool norms for U.S. non-patients as well as patients with psychiatric diagnoses were derived.

This new integrated system became the Rorschach Comprehensive system, first published in 1974¹⁷⁷.

The Rorschach method with its various codes and related interpretations had up till this time evolved from a massive amount of clinical experience of psychologists working with psychodiagnostics, as well as from their integration of psychodynamic and psychoanalytic theory with the Rorschach. Exner's approach is considered to be the first empirical. This means it had quite another starting point, although the years of clinical experience and theory had of course made imprints, and are embedded in the Rorschach method.

During the last three decades, Exner has proceeded to work with the system, and the 4th edition of volume 1 of the Rorschach Comprehensive System was published in 2003¹⁴⁹.

Several other researchers have provided considerable contributions to the system, a few examples are providing clearer coding guidelines¹⁷⁸, studying the indices^{179,180}, elaborating new indices and constellations^{181,182} and exploring interrater reliability^{183,184}.

1.3.4 The Rorschach variables

In the problem-solving task of forming answers to what the cards may look like, the person being tested has to rely on the unique inner experience. The answers given can vary much from person to person. The same card can give rise to such different answers as “a decaying leaf” from one person to “a woman in the middle dancing with two men”, and from yet another person “a black bat about to attack”. Some commonly given answers also recur among many persons, and constitute so-called “popular” answers.

1.3.4.1 Examples of Rorschach codes and corresponding answers

The answers given are coded according to operationally defined criteria in the Comprehensive System. The Rorschach-variables can be illustrated by describing examples of an answer that implies a certain code. Some of the variables that are not sums, ratios or percentages but can be illustrated by one answer are listed below.

Table 1. Examples of Rorschach codes and corresponding answers.

Variable name	Measures	Coding criteria	Example (critical parts of the answer italicised)
Anatomy and X-ray (An+Xy)	Bodily concern / anxiety	Reporting anatomy content or X-rays.	Here are <i>lungs</i> , and in the middle the <i>heart</i> , an <i>anatomical chart</i> .
Cooperative movement (COP)	Anticipation of mutual interactions.	Movement response that is cooperative.	Two persons <i>doing a dance together, holding each other's hands</i> .
Food contents (Fd)	Dependency	Edible content natural for humans' or animals.	Pieces of a cracked <i>biscuit</i> .
Form Dimension (FD)	Self-inspective ability	Using contours of the blots for the impression of perspective.	<i>A long road appearing more narrow far away</i> .
Animal movement (FM)	Physical demand states.	Animal activity common for the species.	<i>A lion running here, probably going to attack</i> .
Inanimate movement (m)	Situation related stress	Inanimate movement	<i>A waterfall, the water splashing here</i> .
Morbid Content (MOR)	Damaged self-imagery, pessimism	Something as damaged, decayed, injured etc.	<i>A battered butterfly, the wings are damaged</i> .
Popular (P)	Ability/need for conventionality	Answers very commonly reported on the particular card.	This is a <i>bat</i> . (Answer given on card I or V)
Pure Colour (PureC)	Intense emotionality	Colour with no form demand.	This <i>red</i> looks <i>just like a lot of red blood</i> .
Vista /Dimensional shading (V)	Painful self-inspection	Shading of the blot used for the impression of depth or dimensionality.	The <i>nuances</i> here makes it look like a valley, <i>deeper down</i> here where it is <i>darker</i> .
Diffuse shading (Y)	General anxiety	Using diffuse shading features of the blot.	The way in which <i>the colour shifts</i> makes it look like <i>ice</i> .

1.3.4.2 Some coding examples

The full coding of answers can be illustrated by two possible answers a person could start giving on the first card.

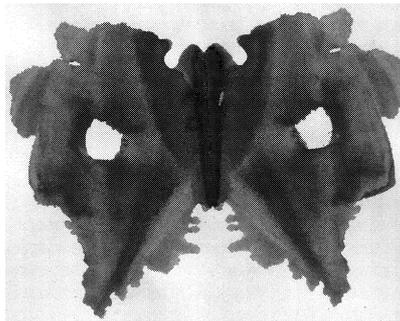
Example of answers given to card I:

- 1) It looks like a butterfly, it's flying. The wings look a bit damaged, like it had been hurt or something.
- 2) Two men making an agreement, shaking hands behind this woman who hunches down in the front. The men have black capes on that are flying in the wind.

The coding for these two answers is displayed below in Table 2.

Table 2. The coding of two answers, registered in a Sequence of scores table.

Sequence of scores								
Card	Resp. No.	Location and DQ	Determinant(s) and Form Quality	(2)	Content(s)	Pop	Z-score	Special Scores
I	1	Wo	FMao	-	A	P	1.0	MOR
	2	W+	Ma.FD.FC'.mao	2	H, Cg	-	4.0	COP



1.3.4.4 *Quantifiable and qualitative data*

The Rorschach generates quantifiable data as well as qualitative data. The quantifiable data are given from the Structural Summary. The sums, ratios and percentages given that are used for basing interpretation on the single patient, can also be used as variables in quantifiable research on larger samples.

Besides generating variables, the answers given to the cards are also used for qualitative interpretation in the clinical work. This qualitative approach accompanies the interpretation of the Structural Summary, as the nature of answers giving rise to particular codes is considered. An example is the answers containing form quality minus (FQ-), that is, the content seen in the card does not resemble the contours of the blot, as there is an arbitrary, unrealistic use of form. Such answers are considered in particular to involve more projection. The answers with a form quality minus given can describe a crucial area of conflict that was projected into the blot. The answers could, for example, be related to aggression and being hurt. Another example is evaluating human and animal movement responses that contain a coding for pair (2), to see if there is a consistency in which interactions are described that can clarify interpretations concerning social relationships.

The qualitative analysis has been more emphasised in psychoanalytic traditions. The sequence of answers is then also considered, and can give information on for example defences operating when an area of conflict has been displayed in an answer. The next answer given can illustrate how the person manages to handle, or cannot handle, the area of conflict in ordinary life. Qualitative interpretation is a vast area and covers many more features of the answers.

Scales complementary to the Comprehensive System have also been developed and can be applied to the answers, giving more systematic information related to psychoanalytic theory. These include scales for psychological defences, object relations¹⁸⁵ and oral dependence^{186,187}.

1.3.5 **The Rorschach – liabilities and utility**

The Rorschach is well-known and has reached popularity. It has become one of the most widespread tests for personality assessment. There has also been criticism of Rorschach raised during the last few decades¹⁸⁸. Some major points in this criticism are issues of reliability, validity and the representability of the norm data.

1.3.5.1 *Reliability*

One major area of criticism concerns the reliability of the data. Rorschach reliability refers to interscorer reliability as well as temporal consistency.

A crucial issue with Rorschach testing is the administration and scoring being correct. Coding the answers requires a large amount of knowledge and experience and there will be many instances with difficult choices between two or more codes. The interrater reliability is important to establish to make sure that independent scorers reach similar

results. The results of the scoring reliability have been questioned¹⁸⁹. The critique on reliability has been met in research examining interrater reliability in several data sets¹⁸³. It was concluded that the majority of Rorschach variables can be coded with good or excellent interrater reliability¹⁹⁰. The need for clearer guidelines concerning scoring has, however, been realized, and progress has been made in this area resulting in a complementary scoring manual with more elaborate instructions and solutions on coding¹⁷⁸.

Although scoring reliability has been scrutinized and addressed, the consistency of test administration and inquiry between different testers has received less attention¹⁹¹. Administration has to be standard, answers recorded, and then most critically, inquired on the critical parts of the answer that can contain important information needed for selecting appropriate codes.

The temporal consistency has also been debated. It has been argued that some variables have lacking test-retest coefficients¹⁹². In reply to this, others have stated that test-retest coefficients have been reported for the variables that are central to interpretation, and that adequate data for temporal consistency evaluation have been shown for these variables¹⁹⁰.

1.3.5.2 Validity

The validity, implying that what is intended to be measured by a test score is actually measured, is another major area in the Rorschach debate^{189,193}. One source of criticism is that several studies conducted on Rorschach variables by Exner and co-workers in the development of the Comprehensive System have not been published in peer-review journals, but are unpublished studies¹⁹². This means that others cannot evaluate the results. Such unpublished research is not uncommon in forming part of the empirical foundation in various tests, not just the Rorschach. However, the importance should be stressed that studies providing foundations for understanding a variable should undergo peer review and be published in scientific journals¹⁹⁰. Rorschach research findings that do appear in peer-reviewed journals have also been synthesized, and these results were considered to yield empirical support for the validity of the Rorschach¹⁹⁴.

A crucial problem in establishing validity of Rorschach scores is the selection of relevant criteria to evaluate the variables against. If there was an objective, easily derived indicator of what is intended to be measured, there would not be a need for the Rorschach in the first place¹⁰⁶. Some of the critique and corresponding attempts to validate the Rorschach against self-report measures of the personality fail to realize the point in using the Rorschach. There is little reason to use the Rorschach to investigate phenomena that can be assessed by asking¹⁵¹.

Behavioural data showing real life behaviour has been suggested as more true and relevant measures to compare with Rorschach scores¹⁵¹. Rorschach scores of oral dependence have, for example, been related to laboratory measures of behaviour, whereas self-report measures of oral dependence were rather related to self-presentation motives¹⁵¹.

A greater emphasis on using observable behaviour as criteria in Rorschach research, and de-emphasis on the use of diagnoses and self-reported data, has been recommended to provide further relevant validation of the Rorschach variables ^{150,151,190}.

1.3.5.3 Reference data

A database comprising 700 non-patients collected by Exner and co-workers constitute the reference data of the CS test ¹⁹⁵. These have been criticised regarding their lack of representability, having too little deviations ¹⁹⁶. Alternative non-patient samples have been collected, and these differ statistically significantly from the Exner norms on 14 variables ¹⁹⁶. A conclusion is that the data published by Exner are not representative for non-patients. As these data are still used for interpretations, there is risk for over diagnosing psychopathology. The risks of overpathologizing should be taken seriously in the clinical setting as well as in research. Research studies based on comparing a selected sample with Exner's reference data can erroneously make the population studied to appear disturbed.

This critique has targeted an important issue, and many researchers conducting Rorschach research have questioned the continued use of the norms ¹⁹⁷. Exner and co-workers have also started to collect new non-patient data, although these do so far not seem to be very different from the original set ¹⁹⁸.

1.3.5.4 Why use the Rorschach?

Working with the Rorschach is time consuming, and this is an important liability in using the Rorschach as a research tool. Collecting large samples is difficult, and the sample sizes that can be attained often imply a rather low power of the studies performed. Interrater agreement has to be established, which means other psychologists must also be recruited to devote their time to the Rorschach interrater coding. So why use the Rorschach?

The usefulness of different assessment methods for different purposes should be noted. Self-report measures could be of most use if the interest is focused on what is consciously available to the participant. As described earlier, motives and reasons for behaviour can, however, be complex and inaccessible for the person. Such information is therefore difficult to discern by self-reports. The use of an indirect psychological technique that is not based on consciously available self-reported information can give information on processes, motives, needs and so on that is partly inaccessible to the person himself or herself. A depth-oriented indirect measure such as the Rorschach is thus useful when the focus of interest is to capture personality aspects that are more or less unavailable and therefore difficult to self-report by the person ¹⁹⁹. Based on research findings others likewise conclude that the Rorschach can have particular relevance in predicting real life outcomes that depend on psychological processes that are largely inaccessible to verbal reports ¹⁵¹.

Implicit motives assessed by an indirect personality assessment technique have a different origin than the self-attributed motives assessed by self-reporting ¹⁹⁹. The self-attributed motives are built on concepts of the self and others that has been formed

during the process of socialisation. It requires linguistic conceptualisation of ideas about the self that are formed by cultural definitions of what is important or right and wrong. This is something learned during childhood that can start to develop once language has been acquired and the socialisation has started. The self-attributed information is filtered through these conscious constructs¹⁹⁹.

Implicit motives, on the other hand, are built more on early, prelinguistic affective experiences. This means they are more primitive and original than the elaborated systems of conscious self-attributed description. Different neurobiological pathways are also suggested, as the implicit motives should have closer connection with physiological systems controlled by midbrain structures, including neurohormone release than do the self-attributed motives. Research findings have supported this²⁰⁰. In evolutionary terms the conscious self-attributed motives have been built on top of the original and more primitive motivational system¹⁹⁹.

Considering the different levels of personality functioning, and how they can differ and even be discordant, is obviously important in psychology.

To summarize, in spite of several limitations, a performance-based technique such as the Rorschach has a potential to yield information about implicit, irrational motives and underlying personality characteristics the individual may not be aware of, or unwilling to expose^{150,151,199}. As the Rorschach provides other types of psychological data than those attained using self-report inventories, it can be an additional tool in assessment. The Rorschach gives a unique type of information that can contribute to a more complete understanding of human behaviours.

1.3.6 Rorschach research on obesity and eating disorders

1.3.6.1 Earlier Rorschach research on obesity and eating disorders

Although research with the Rorschach CS is growing in various fields, few studies have been conducted on obesity. Only two published CS studies could be found up to 2003.

The most recent published in 1995 concerns the role of personality functioning for choice of treatment²⁰¹. In this study patients were subdivided on the basis of level of personality functioning according to the Rorschach. Dimensions chosen for classification were ability for adjustment, desire for comfort, flexibility and imagination. The groups resulting from this classification could be divided into “Relatively healthy personality” and “Relatively less healthy personality”. Adaptability and control of impulse were two additional dimensions for describing the groups formed. This classification revealed that the prevalence of mental and physical symptoms as a result of VLCD- treatment, as well as a later rebound of body weight after treatment, was more frequent among the patients with a less healthy personality. The VLCD treatment was then adapted to the prerequisites for each group. The patients with “healthy personalities” received severe diet restrictions. Those with “less healthy personalities” received a modified program, as severe restrictions would be too stressful to them and could cause undesirable reactions. Aims of weight reduction and duration of treatment were also different for the two groups. These adjusted versions of VLCD

treatment matched to the respective groups resulted in a better treatment outcome. The precise method used for subdividing the patients on Rorschach variables is unfortunately not described in this study.

The other CS study is from 1992 and describes a high prevalence of alexithymia (impairment in symbolization and expression of emotions) in an obese sample as compared to Exner's reference data²⁰². Hypothesised Rorschach alexithymia variables included those related to fantasy, affects and available resources, which were lowered among the obese. Impoverishment of fantasy and incapacity to express one's feelings are discussed for the sample.

The remaining Rorschach studies within the field of obesity use earlier Rorschach systems. In one of these studies²⁰³ the Rorschach was administered as a group test with slides^{204,205} on 30 obese persons in a weight-reducing program, and scored according to a traditional primarily Klopfer-based scoring^{148,205,206}. In this study including the Rorschach as well as other methods, repression and denial were described as common defence mechanisms. Subjects who achieved better weight loss results in the treatment were less hostile, but more depressed, vulnerable and dependent subjects. Among Rorschach variables associated with less weight loss was faulty perception of reality²⁰³.

Based on psychoanalytic theories of obesity, oral dependence seen in Rorschach oral imagery has also been focused. Higher levels of oral dependence in obese as compared to controls have been found in one Rorschach study scoring answers for oral dependence and oral sadism¹⁸⁶. Using the same criteria for oral dependence in the Rorschach, now referred to as the Rorschach Oral Dependency Scale (ROD)²⁰⁷ others have not replicated this finding²⁰⁸.

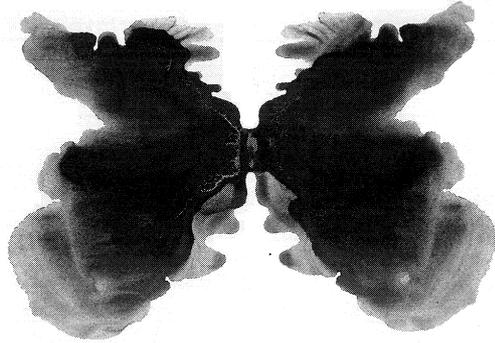
In psychiatric samples with eating disorders such as anorexia nervosa (AN) and bulimia nervosa (BN), oral dependence according to the ROD have also been found^{208,209}. Other Rorschach studies of AN and BN describe psychological defence structures^{210,211} and thinking disorders²¹²⁻²¹⁴. These studies on AN and BN are mostly based on the CS but some have also used earlier systems such as the Klopfer based system¹⁷⁰ and various scales for psychological defences and other aspects of personality.

1.3.6.2 Rorschach research on obesity and eating disorders: concluding comments

The Rorschach has been criticised on various grounds^{189,192,196}. In spite of this the Rorschach can have a potential role as a complementary method in research on obesity and eating disorders. As earlier described, motives and reasons for behaviour can be complex and inaccessible for the person¹¹⁸. Furthermore, eating disordered populations may in particular have a tendency to distort self-reported information in a socially desirable direction^{215,216}. The underlying personality variations affecting obesity behaviours difficult to discern by self-reports, could be assessed using the Rorschach. The Rorschach has been carefully considered as a promising research instrument by researchers reviewing assessment methods for eating- and weight related disorders²¹⁷. The Rorschach is suggested to be more sensitive than self-report inventories, but it is

also noted that more research is needed on the Rorschach, particularly with obese samples.

The Rorschach could more sensitively capture differentiating personality information enhancing an understanding of the heterogeneity in the obese population. Personality characteristics that can have particular relevance for body weights and eating behaviours can also be targeted.



2 AIMS OF THE THESIS

The main aim of the thesis is to investigate if Rorschach personality data can contribute to our understanding of obesity, eating behaviour and treatment outcome.

More specific aims are:

Study I

To investigate if *a priori* defined subgroups based on Rorschach data can be identified in an obese clinical population, and be further validated to other types of data.

Study II

To explore if degree of obesity is related to Rorschach personality aspects of mental distress and self-estimated depression according to the Beck Depression Inventory.

Study III

To study experimentally measured eating behaviour such as initial eating rate and the eating curve during a single meal in relation to personality according to the Rorschach.

Study IV

To investigate if Rorschach data can explain difference in food intake with the satiety enhancing drug sibutramine vs. placebo in an experimental within subject cross-over design.

Study V

To investigate if Rorschach and subjective ratings of depression can predict weight loss in treatment with sibutramine.

Study VI

To investigate if the Rorschach can predict weight loss in a behaviour modification treatment.

3 METHODS AND SUBJECTS

3.1 SUBJECTS

The study sample comprises a total of 120 patients at the Obesity Unit, Huddinge University Hospital. The patients had been referred to the outpatient unit, mostly by a general practitioner or by a specialist. They were assigned to treatment with behaviour modification treatment or pharmacological treatment with sibutramine. Totally 145 patients assigned to the programs were invited to Rorschach testing, and 121 of these accepted, giving a response rate of 84%. Of the 121 Rorschach protocols 120 were complete; one was incomplete because of card rejection (no answer given to one of the cards) and had to be omitted. None of the patients had a known genetic disorder causing obesity.

The distribution and description of the subjects in study I-VI are shown in Table 3. In study II, all 120 patients in the total sample are included. Study I comprises the 100 patients collected at the time the study was performed. Study III-VI comprise the patients belonging to the clinical trial and weight loss studies.

The patients gave their informed consent to participate, and the study has received approval by the local Ethics Committee at the Karolinska Institutet.

Table 3. Descriptive data of the subjects in study I - VI.

Study	N	Gender	Age (mean \pm SD) years	BMI (mean \pm SD) kg/m ²
I	100	24 M, 76 F	43 \pm 12	41 \pm 6
II	120	36 M, 84 F	44 \pm 12	41 \pm 6
III	32	8 M, 24 F	41 \pm 12	39 \pm 4
IV	36	9 M, 27 F	43 \pm 12	39 \pm 4
V	30	8 M, 22 F	43 \pm 12	40 \pm 4
VI	49	18 M, 31 F	42 \pm 11	42 \pm 5

3.2 ASSESSMENT METHODS

3.2.1. The Rorschach method

The Rorschach (Comprehensive System)^{149,152}. The Rorschach method has been described in detail in the Introduction. The Rorschach generates several variables related to various kinds of personality functioning. Some of these could have particular relevance in the study of obesity behaviours. The variables chosen for the studies on obesity, eating behaviour and treatment outcome that are included in the thesis are presented below.

Table 4. Rorschach CS variables investigated in study I – VI in alphabetic order (abbreviation), and the corresponding intraclass correlation coefficient (ICC) showing interrater reliability.

<i>Rorschach variable</i>	<i>Measures</i>	<i>(ICC)</i>
Affective ratio (Afr)	Affective responsiveness to external stimuli	1.00
Anatomy and X-ray (An+Xy)	Bodily concern and anxiety related to the body	.74
Coping Deficit Index (CDI)	Vulnerabilities to efficient coping with everyday demands	.55
Cooperative movement (COP)	Anticipation of mutual, positive interactions	.84
Depression Index (DEPI)	Difficulties with emotions /tendency towards depression	.81
D-score	Stress sturdiness or lack thereof	.69
Experience Balance style (EB style)	Basic styles in problem solving	.78
Ego Impairment Index (EII)	Ego impairment	.87
Experienced Stimulation (es)	Experienced stimuli demands	.95
Food contents (Fd)	A dependency orientation	.88
Form Dimension (FD)	Self-inspective ability	.83
Animal movement (FM)	Physical demand states	.94
Lambda	Constricted basic style if high	.76
Inanimate movement (m)	Situation related stress	.85
Morbid contents (MOR)	Damaged self-imagery, pessimism	.72
Populars (P)	Ability/need for conventionality	.85
Perceptual Thinking Index (PTI)	Distortions in thinking and perception	.73
Pure Color response (PureC)	Intense emotionality	.80
Schizophrenia Index (SCZI)	Distortions in thinking and perception	.75
Dimensional shading (Sum Vista)	Painful self-inspection	.62
Diffuse shading (SumY)	General anxiety	.74
Weighted Sum of special scores (Wsum6)	Distortions in thinking	.90
Weighted Sum of Colour scores (WsumC)	Available affects	.94
Form quality minus (X-%)	Distortions in perception	.67

3.2.2 Rorschach interrater reliability

From the data pool of 120 protocols, 25% (30 protocols) were randomly selected and rescored independently by one of two other psychologists who were blind to the scoring of the first author. The total number of answers in the 30 protocols was 536.

Interrater agreement was calculated using the Rorschach Research Utility²¹⁸, providing Cohen's Kappa (κ) for response level scores and the intraclass correlation coefficient (ICC) for protocol level reliability of summary scores. According to established criteria on cut-off levels²¹⁹⁻²²¹ there was an excellent agreement (defined as $\kappa = .75-1.00$) for the main segments Location and Space ($\kappa = .96$), DQ ($\kappa = .84$), Determinants ($\kappa = .87$), Pairs ($\kappa = .88$), Contents ($\kappa = .82$), Populars ($\kappa = .93$) and Z-Score ($\kappa = .88$). Good agreement (defined as $\kappa = .60- .74$) was reached for Special Scores ($\kappa = .69$).

For the particular variables investigated in study I–VI, the protocol level agreement of summary of scores is displayed in Table 4. The ICC was excellent or good for the majority of variables. Fair agreement ($\kappa = 0.40-0.59$) was reached for one variable, the CDI.

3.2.3 Beck Depression Inventory

The Beck Depression Inventory (BDI)²²² was used as an additional tool for assessing clinical depression. Sum of scores were used for analysis. The BDI items concerning reduced appetite and recent weight loss were discarded from analysis, as these are not relevant indications of depression in obese samples. In the more recent BDI-II, increased as well as reduced appetite has been included as an indicator of depression³⁹.

3.2.4. The VIKTOR equipment

For the measurement of eating behaviour we used VIKTOR, a computerized eating monitor (Cabmek, Stockholm, Sweden), originally described by Kissileff et al.²²³, and further developed by Barkeling et al.^{224,225}. With VIKTOR the microstructure of eating behaviour is measured through a hidden scale built into a table, connected to a computer registering the amount of food eaten every second. Among the data obtained are amount of food consumed in grams, initial eating rate (g/min) consisting of a linear coefficient, and the relative rate of consumption, i.e. a decelerating or accelerating rate of consumption during the meal, defined as g/min^2 .

3.2.5. Interview data

A structured interview on baseline characteristics was used for collecting sociodemography data and information related to eating behaviour and obesity history. The items used and their corresponding definitions are displayed below.

1. "Education" consist of six categories, put together into two groups for presentation. "Lower education" includes non-finished and finished compulsory school,

and vocational training. “Intermediate and higher education” includes college with theoretically oriented programs, post-college educations, and university.

2. “*Socio-economic level*” likewise consist of six categories, defined according to the Swedish socio-economic classification ²²⁶. These categories include manual workers, non-skilled and skilled, assistant non-manual employees, intermediate and higher non-manual employees, professionals with or without subordinates, upper-level executives, self-employed professionals and entrepreneurs.

3. “*Parental obesity*” refers to whether either one of the patients’ biological parents was obese as defined by the patient.

4. “*Age at onset of obesity*” defined as the onset of a substantial increase in body weight, was divided into “Childhood” defined as before age 13, “Adolescence” defined as age 13-19, and “Adulthood” defined as from age 20.

5. “*Weight during adulthood*” refers to if the patient ever did have a normal weight (in own standards if weights were not remembered) as an adult, or was always obese as an adult.

6. “*Weight fluctuations*” refers to alterations in body weight, by the patient recognized as “considerable”. Our definition implied alterations of at least 5-10 kg, resembling definitions used earlier, although no standardized definition exists for weight cycling ²²⁷. Our categories included “stable weight”, meaning largely the same weight year by year, “sporadic fluctuations” and “frequent fluctuations”, where the latter refers to considerable alteration in body weight several times in the past few years.

7. “*Meal patterns*” includes “regular meals”, defined as having three intakes of food somewhat evenly distributed over the day, “irregular meals” refers to an aberration from the regular pattern, and “chaotic meal patterns” refers to the absence of any regularity.

8. “*Emotional eating*” refers to subjectively reporting eating due to emotional reasons such as emotional distress or loneliness, sometimes or often, as opposed to reporting never eating due to emotional reasons.

9. “*Binge Eating*” refers to regularly consuming large amounts of food in an addictive way and with a lack of control, being in distress about this behaviour. The definition matches the criteria suggested for Binge Eating, but does not have to match the criteria for a full Binge Eating Disorder.

10. “*Periodic eating variations*” refers to reporting variations in amount of food consumed during the year, e.g. seasonal, during difficult times in the life situation etc., as opposed to not having such variations.

11. “*Body size having a psychological significance*” includes a description of feeling a psychological protection in having a large body. Body size can also serve as an excuse for avoiding things, or be an essential part of identity.

12. “*Childbearing*” refers to women having delivered children.

13. “*Obesity related diseases*” refers to having diagnosed medical diseases regarded as consequences of obesity, including type 2 diabetes, hypertension, cardiovascular diseases and sleep apnoea.

14. “Pain problems” means experiencing physical pain problems that are likely to be a consequence of obesity, such as backaches and ache from other weight bearing limbs.

3.2.6 Methods in study I – VI

The methods, outcome measures, study designs and statistics used in study I – VI are displayed in Table 5.

Table 5. Methods, outcome measures, study designs and statistics in study I – VI.

<i>Study</i>	<i>Method</i>	<i>Outcome measure</i>	<i>Study design</i>	<i>Statistics</i>
I	Rorschach Interview data	A priori concepts	Descriptive study	Fischer χ^2 , t-test
II	Rorschach BDI Interview data	Degree of BMI	Within-group comparisons	Pearson’s r, t-test, ANOVA
III	Rorschach VIKTOR	Initial eating rate Eating curve	Experimental design	Pearson’s r, Spearman rho, ANOVA
IV	Rorschach VIKTOR	Food intake with sibutramine vs. placebo	Experimental: Placebo-controlled within subjects design	Pearson’s r, Multiple linear regression analysis
V	Rorschach BDI Interview data	Weight loss	Outcome (follow up)	Pearson’s , t-test, ANOVA, Multiple linear regression analysis
VI	Rorschach Interview data	Weight loss	Outcome (follow up)	Pearson’s r, Multiple linear regression analysis

3.3 PROCEDURE

All Rorschach tests were administered at baseline, before start of treatment and clinical trial. The interview collecting information related to sociodemography, eating and obesity history, was performed by the same psychologist, and preceded the Rorschach testing.

Weights and heights were assessed at baseline when the patients entered the treatments. Weights were measured using electronic scales and all weights are

measured without shoes but include light clothing. Height was measured using a meter reader attached to the wall, according to the routine at the Obesity Unit.

VIKTOR was administered in a baseline measurement of eating behaviour at the onset of a clinical trial, and at day 14 in the active and placebo conditions of the trial. Four hours after a standardized breakfast, an excessive portion of homogenous test meal was served as lunch on the VIKTOR, together with a glass of water, and subjects were asked to eat until satisfied. During the test meals, the microstructure of the patients' eating behaviour was registered with the VIKTOR.

The persons collecting Rorschach, VIKTOR data and body weights, respectively, were blind to each other's data.

3.4 STATISTICAL ANALYSES

For statistical analyses non-parametric and parametric tests were performed. Mainly parametric tests were used, following guidelines on the normality of distributions concerning psychological data, taking skew and kurtosis into account²²⁸. The statistical analyses performed in study I through VI are displayed in Table 5.

The distributions were analysed graphically to detect potential outliers. The selected level of statistical significance was two-tailed $p < .05$. For all analyses the Statistical Package for Social Sciences (SPSS for Windows, version 11.0, 2001, Chicago, IL, USA) was used.

Effect sizes are provided in r and are reported in study II - VI. The effect size magnitudes are interpreted according to established guidelines, where small = .10, medium = .30 and large = .50²²⁹.

4 RESULTS

4.1 PAPER I

In this study conceptual (*a priori*) subgroups based on personality findings were described and further compared to general anamnestic and behavioural data. Depressive features (Rorschach Depression Index) and coping difficulties (Coping Deficit Index) that could have a particular relevance in obesity were chosen for subdividing the patients. The largest subgroup, comprising around 40% of the patients, was Rorschach characterized by difficulties with emotions and a tendency towards depression. Demographic and behavioural data for this subgroup revealed intermediate or higher education, regular meals, more eating disorders like binge eating, periodic variations in eating, and experiencing body size as having a psychological meaning. The other subgroup comprising around a fourth of the patients was characterized by coping liabilities and was further associated with a lower socio-economic level and irregular or chaotic meal patterns. For the group with emotional difficulties the results suggest a more complex psychological pattern, where eating and emotions could be closely related. The group with coping liabilities could have other difficulties than emotional concerning food and eating, such as finding a structure for eating and making changes in lifestyle and habits.

4.2 PAPER II

Depression and psychopathology are often found to be more common in obese compared to normal weight subjects. It is, however, unclear if higher degrees of obesity are associated with more depression and psychopathology than modest levels of obesity. In this study we related Rorschach personality measures of mental distress, and also self-reported depression to degree of obesity.

Mental distress including depressive features and psychopathology such as distortions in perception and cognitions, were not related to degree of obesity. Bodily concern and anxiety related to the body (An + Xy) was negatively related to degree of obesity, with patients in relatively lower degrees of obesity appearing more concerned or anxious with the bodily status. According to general descriptors heavier patients had lower educational and socio-economic level, and more bodily pain problems.

Mental distress was not related to body weight, in spite of findings of more depression in obesity compared to normal weights. Other factors than severity of obesity would account for the mental distress among obese patients.

The differences in bodily concern and anxiety in varying degrees of obesity could be related to the social and educational context, where attitudes towards obesity differ. Less Rorschach signs of bodily concern in the morbidly obese contrasted with more self-reported bodily pain problems.

4.3 PAPER III

In this study the relationship between the microstructure of eating behaviour and personality aspects was investigated. Eating behaviour was measured using the computerized eating monitor, VIKTOR, calculating initial eating rate and the eating curve. A higher initial eating rate, reflecting eating drive, was associated with Rorschach signs of psychological stress overload (D-score minus), and higher affective responsiveness to external stimuli (Affective ratio).

Stress overload may prompt eating. The kind of stress overload found in a higher initial eating rate implies an unpleasant situation of strain that for some subjects can lower the capacity for control. Affective responsiveness that was also related to a higher initial eating rate entails being motivated by impressions from the outer world in a way that activates behaviour. This proneness to react and respond to external stimuli can be applied to food stimuli as well. A higher sensitivity and reactivity to cues such as the sight and smell of food may affect appetite, and hence increase the eating rate.

The results on the eating curve showed that a biologically unexpected accelerating rate of consumption during the meal was associated with intense emotionality (Pure C) and oral dependency (Food responses). Personality aspects related to emotions and oral dependency may give information on the absence of an expected decelerating “satiety curve” during the meal with regard to obese persons.

4.4 PAPER IV

In this study effects of the satiety-enhancing drug sibutramine (Meridia™, Reductil™) on food intake were related to personality. The placebo-controlled crossover within subjects design used implied food intake after 2 weeks in the sibutramine and placebo conditions was assessed with a test meal using the VIKTOR set-up.

Less food consumed after sibutramine vs. placebo could be explained by a model including higher affective responsiveness (Afr), adjustment to social expectations (Populars) and unfavourable self-regard (MOR). These results suggests sibutramine may reduce food intake in single test meals for subjects whose appetite is prompted by external stimuli including food cues, suggested by the Affective Ratio. Affective responsiveness could imply aspects of appetite revealed in short term measures of appetite. Distress related to the body in obesity seen in damaged self-imagery (MOR), and adjustment to social expectations (Populars) could also have a moderating effect on the participants’ consumption of test meals in an experimental design. Bodily concern (An+Xy) was also related to the outcome in the univariate analyses. Psychological factors that are seldom accounted for could influence the results in experimental designs using a placebo condition.

4.5 PAPER V

In this study psychological and clinical factors were studied in relation to weight loss results in treatment with sibutramine, an anti-obesity drug enhancing satiety. The

treatment comprised 15 mg sibutramine administered daily, and monthly dietary advice. A multiple linear regression model including the Rorschach predictors physical demand states (FM) being intrusive or difficult to hold and a dependency orientation (Food contents) could explain almost half of six months weight loss. A model including a well-known predictor such as initial weight loss in addition to the Rorschach predictors increased the explaining value additionally. Self-inspective ability was also related to weight loss according to the univariate analyses.

The personality factors provided positive predictors of weight loss. Patients with difficulties concerning physical demand states also including hunger, implying behaviour can be more influenced by these demand states, could in particular have reduced their eating behaviour with enhanced satiety, seen in more weight loss. Furthermore, enhanced satiety could also have helped patients with a dependent need for food, to limit food intake. Alternatively, patients with a dependency orientation could have benefited from being enrolled in treatment. Initial weight loss did also contribute as a positive predictor of weight loss in sibutramine treatment, in accordance with prior research.

4.6 PAPER VI

In this study six-month weight loss for obese patients in a behaviour modification program was related to Rorschach personality characteristics. Signs of perceptual and cognitive distortions indicated by the Schizophrenia Index (SCZI), predicted less weight loss, in particular for the men. Indications of ego dysfunctions seen in distortions in perception of reality and coherent cognition did imply difficulties in weight reduction in a behaviour modification program. Such ego-dysfunction would constitute more severe difficulties in obesity behaviours, important to recognize in obesity treatment.

More weight loss was predicted by a dependency orientation and food preoccupation (Food contents), in particular for the women. With a dependency orientation there may be a psychological need for food, besides a dependent orientation in relating to others. For women physical demand states (FM) also including hunger was, furthermore, positively related to weight loss. Patients with these eating-related personality characteristics could benefit above all from a learning how to handle the relationship to food and eating, as evidenced by more weight loss. Patients with a dependency orientation may also have benefited from being included in the social setting of the treatment program, resulting in more weight loss as long as active treatment persists.

A behaviour modification program could be better suited for some patients than others, and personality tests could give more information on treatment selection strategies.

5 GENERAL DISCUSSION

By using Rorschach data in the study of obesity, variables reflecting traits of interest in relation to the outcome measures used in study I-VI were available. We have described traits that were not derived through self-reports, but rather inferred from the Rorschach variables based on the patient's response to the inkblots. This is a very uncommon approach in the study of psychology and obesity today, and could be an important additional research approach in this area. Overall, we were not limited to the patient's awareness and insight into behaviour, or willingness to accurately report this. As eating disordered patients in particular have been suggested to answer questionnaires in a socially acceptable way^{215,216}, Rorschach can have a particular relevance in these kinds of samples.

Furthermore, personality data derived by a performance-based technique have been suggested to capture more implicit motives that are not filtered through conscious constructs formed by the socialization process, but are rather more primitive and original motivators of behaviour¹⁹⁹. Considering the discrepancies reported concerning what obese patients referred to treatment say and do²³, it would be of importance to understand the more original and even irrational motivational systems. Some examples of these types of characteristics are physical demand states and a dependency orientation, and intense emotionality and affective responsiveness described in study III-VI.

Some of the variables used in the studies would be difficult to capture with self-reports, like distortions in perception of reality, affective responsiveness, oral dependency and adaptation to social expectations, and also coping capacity including access to psychological resources such as affects, imagination and intelligence, appearing in study III-VI and I.

5.1 DIFFERENT TYPES OF DIFFICULTIES IN OBESITY

Emotional and other types of difficulties in obesity

Difficulties with emotions and a depressive tendency were found in half of our patients. This is in agreement with other research findings of depression in obese clinical samples, although these results cannot be generalized to a non-clinical obese population, as more depression and psychopathology are found in patient samples²³⁰.

We suggested that patients with difficulties with emotions could be considered to constitute a distinctive subgroup among the obese patients, with a more complex relationship to food. Besides having more binge eating and periodic variations in food intake over time that are known to be linked to depression in obesity, we could also show that they had a more complex relationship to the obese body itself as this was entangled with a psychological meaning, which may constitute an unforeseen difficulty in weight loss. We have found no other recent research studies investigating such psychological motives for being obese since the psychoanalytic observations⁴¹.

Findings from study III could also be related to the original psychological postulates in obesity and a psychosomatic hypothesis, as the obese patients with more signs of psychological stress overload ate faster, suggesting that eating behaviour is affected by inner strain.

Some essential parts of the early psychological theories on obesity⁴¹⁻⁴⁵ therefore still seem to have actuality and should not be totally discarded. Simultaneously it is just as important to note that simplifying generalizations such as ascribing emotional difficulties to all obese patients should be avoided. Quite different problems than emotional can clearly account for the behaviours in obese persons, although these correlates can be less easily recognized and understood in obesity treatment and research.

Difficulties in coping with everyday demands due to a lack of psychological resources were suggested by us for a subgroup in study II. The possibility of problems with managing eating was also strengthened by the irregular or chaotic meal patterns found for this group. Other patients could have still other difficulties that were not captured in the proposed subgroups. In study VI difficulties in achieving weight loss in obesity treatment was noted for patients with ego dysfunctions such as distortions in perception. This implies problems quite different from those related to emotions or the psychological need for food that are less amenable to a popularised understanding.

Depressive features and psychopathology was not worse in higher levels of body weight, according to study II and I. Such a lack of a linear relationship should be noted. It could be assumed that depressive features are worse the more obese a person is, as obesity has been shown to imply a suffering²⁵. Our results did not confirm such an assumption. In our patients referred to obesity treatment, it does not appear to be severity of obesity that determines who has more emotional encumbrance. Instead, aberrations in eating and a complex relationship to the body can identify the patients with emotional distress.

Bodily concern

More bodily concern were found in the less obese in study II, and bodily concern as well as experiencing the body as damaged, were furthermore possible psychological moderating factors in an experimental design with an anti-obesity drug, described in study IV. Being concerned or even anxious about the bodily status in obesity may be a personality expression of the more unaccepting attitudes towards obesity in higher socio-economic levels^{231,232} to which the less obese patients more often belonged. Bodily concern can also imply stronger wishes for help and thus influence behaviour in short-term measurements, as suggested in study IV.

Rorschach signs of bodily concern and anxiety concerning the body were less apparent in the massively obese patients, in spite of bodily pain being more common in higher weights, as described in study II. As a personality measure of bodily concern was inversely related to body weight, this could give information on the psychological mechanisms in those patients who have reached the most health hazardous, physically limiting weights. Realizing that these patients are not as alarmed by their physical state

that we might have expected considering their difficulties and self-reported problems, this can help us understand some of the obstacles to making changes.

This discrepancy between health hazardous weights and pain problems and bodily concern could indicate an avoidance of fully realizing the magnitude of the obesity associated problems, as this could be too distressing. Alternatively, it could be argued that persons at risk for developing morbid levels of body weight have a psychological disposition that causes less alarm as the body weight gradually increases, and more morbid levels of obesity can develop.

The result on the Rorschach variable bodily concern and body weight also illustrates how a personality measure can add information that would not have been considered if only the objective information on limitations and bodily status had been given.

Our results can also be compared to findings on degree of BMI in research with the MMPI suggesting that more disturbed and anxious obese patients had a relatively lower BMI than the less distressed who had the highest body weights¹³⁰. Another MMPI study describes less hypochondria in the super obese compared to other samples¹³².

5.2 PERSONALITY ASPECTS OF APPETITE AND EATING

Responsiveness to food cues

Affective responsiveness was a personality characteristic related to appetite through a higher initial eating rate (study III) and a greater effect of the satiety enhancing substance sibutramine on immediate food intake (study IV). Affective responsiveness was, however, not related to later weight loss in treatment with sibutramine (study V). This suggests that Affective responsiveness could be a measure of appetite that is foremost apparent in single test meals.

Affective responsiveness implies being motivated by emotionally loaded impressions from the outer world and may reasonably be applied to food stimuli as well. Sensitivity to cues such as the sight and smell of food may affect appetite. The association between affective responsiveness and appetite could be placed in the context of the classic externality theory by Schachter, suggesting that obese are more externally receptive to food cues²³³. Perhaps affective responsiveness could have described an aspect of appetite that is rather immediate, being linked to the food cues present in the eating situation, and therefore became apparent in single test meals. It should be noted that the classic research on externality was likewise mostly conducted on immediate food intake in experimental settings and not in the patients everyday life.

We do not know if the link found between affective responsiveness and eating holds true in a normal weight sample. If food is perceived as vital and interesting stimulus for the person, this will likely have impact on the behavioural response to food stimuli. For a normal weight person with less interest in food, there may not be such a link between affective responsiveness and appetite. Quite different areas of life would rather be experienced as emotionally rewarding, eliciting an emotional response.

Affective responsiveness is generally considered as a personality resource, as it implies an interest in experiencing or being around emotional stimuli. Somewhat

surprisingly then, a personality asset was related to appetite. This may have some interesting additional treatment implications. Affective responsiveness indicates a potential to profit from many other stimuli of life besides food. Persons with a high affective responsiveness have therefore a potential to be stimulated and enriched by a variety of life situations besides food. This may be a positive treatment focus for some obese patients, as they can be encouraged to find alternative sources of fulfilment in life.

Needs for food

The eating related personality features associated with eventual weight loss, were rather those related to needs, as described in study V and VI. Such needs could have physical or emotional origins, seen as physical demand states, and a food preoccupation and oral dependency. Dependency traits were also associated with an absence of a decelerating rate of consumption during the meal in study III, and it was suggested that if eating is motivated by a psychological need for food rather than hunger, this may result in an eating pattern lacking the biologically expected signs of satiation.

In obesity treatment with a satiety-enhancing drug, or in learning to handle food and eating in a traditional program, physical and dependent needs for food could have become easier to handle. These treatment interventions can temporarily have facilitated the patient's ability to alter food habits and in abstaining from food. Patients eating due to needs and oral preoccupation can have more to gain from treatment approaches targeting their type of difficulty: hunger and eating habits.

State and trait aspects of appetite

The results in study III-VI also suggest the identification of different aspects of personality that could exert influence in an immediate eating measurement, or in prolonged everyday life, respectively. Needs for food such as physical demand states and a food preoccupation and dependent needs for food could have a greater everyday impact in the patients' lives than an external receptiveness to food cues, and was therefore apparent over a longer time period as suggested by the eventual weight loss results.

Tentatively, these findings could reflect state and trait aspects related to hunger and appetite, to be further explored. This could contribute to more understanding of appetite and obese eating behaviour.

Experimental research on eating

Another implication concerns the field of research conducted on appetite in experimental test meals. Assumptions about appetite in test meals may not be generalized to eating behaviour in natural situations over longer time spans. Appetite and hunger, describing the motivation and need to eat, can entail various aspects that

are manifested differently within single test meals or in prolonged everyday life behaviour.

A last notable consideration concerning experimental designs is that the influence of psychological moderators should also be regarded in the effects studied, as shown in study IV. We could find no earlier published studies considering the fact that the personality characteristics of the persons participating in pharmacological trials can matter. We could show that psychological factors may have a moderating effect on the results, causing results that do not just reflect the biological effect of the drug studied. Such moderators can be related to having greater needs for help with the obese situation, and therefore likely a greater wish for having an effect of the drug. Another moderator that can be of a more general nature is being prone to adjust to social expectations. The experimental situation can be perceived as a social task where the behaviour should be altered in a direction that could be anticipated as desired by the test-person.

5.3 PERSONALITY FUNCTIONING IN OBESITY

Ego functioning and eating behaviour

The results can also be discussed in a framework of personality functioning. The positive predictors of weight loss were those related to oral traits such as dependency and furthermore physical demand states reported in study V-VI. Oral activities such as eating may have a particular importance with a dependency orientation. The notion of oral traits has roots in the psychoanalytic theories on libidinal development²³⁴. Due to fixations at the oral stage of development or regression to oral strivings as a response to later life situation, a preoccupation with oral activities such as eating may result. Food can also have an important symbolic meaning as a gratifier and comforter. The other crucial variable identified in relation to weight loss was deviating levels of physical demand states, also including hunger. Theoretically, the physical demand states suggested to be measured by FM would be included in the biologically based urges described by drive theory²³⁵.

This means that psychological needs for food as well as physical drives could indicate relatively more neurotic and more “classic” reasons for overeating. Such characteristics could be considered as more benign from a personality perspective. This is also in agreement with the ability to alter body weights found for these patients.

A negative predictor of weight loss was perceptual distortions according to study VI. Ego dysfunctions involving distortions in perception and thinking are more profound problems in personality functioning. Reality testing and coherent thinking are fundamental steps in ego development and in intact cognitive functioning. Ego-distortions can be seen in a smaller or larger extent in persons with different underlying causes such as more disturbed personality processes²³⁶. Impairments in ego functioning can also be related to neurological disturbances^{237,238}. An example of such dysfunction is attention deficit and hyperactivity disorder (ADHD) discussed in study VI. We suggested distortions in perceptions and thinking could disrupt the ability to adhere to and gain from the treatment and function efficiently, or perhaps even difficulties in

accurately perceiving and registering food intake, and adjust food intake to energy expenditure. According to our results, men might further be more vulnerable than women in this area.

Rorschach indications of distortions in perception and cognition has earlier been useful for predicting poorer performance in a other areas of life ²³⁹, supporting that accuracy of perception and coherent ways of thinking are important for behavioural achievements. Our results on perceptual distortions could also be compared to the earlier findings of underreporting food intake and overreporting physical activity in obese samples ²⁴, suggesting difficulties in accurately perceiving and realizing parts of reality.

From a personality perspective, it should thus be noted that some obese patients are likely to have problems related to ego functioning to be considered, rather than inner psychological motives for eating. Consequently, aspects of ego functioning could be regarded in assessment in obesity clinics.

Personality functioning and treatment implications

Personality functioning and ego capacities are basic consideration in psychiatric assessment and treatment ^{235,240,241}. Fundamental principles of personality functioning can also reasonably be applied to the treatment of obesity. Overeating due to ego-distortions can represent more profound difficulties in treatment.

In the previous Rorschach study on VLCD treatment in obesity the lower functioning patients, called the “less healthy personalities” encountered more difficulties in VLCD treatment, and regained their body weight after treatment ²⁰¹. Furthermore, Rorschach signs of faulty perception of reality were related to poorer weight loss in previous obesity research ²⁰³, as well as in our results in study VI. Patients with these kinds of more profound difficulties in functioning are thus at risk for failure in traditional treatments. The demands posed on the participants in such treatments can be too difficult for these patients to accomplish. Taking charge of one’s eating habits and lifestyle, and resisting from eating as usual, poses considerable demands on the patient’s psychological resources. When VLCD treatment was adjusted to the less healthy personalities, implying less restriction in diet, lower weight loss target, and giving more support, encouragement and reward, outcome results were better ²⁰¹. This would constitute an ego-supportive approach.

We have also found that patients with distortions in perception and thinking did accomplish weight loss in sibutramine treatment as well as the patients without such dysfunctions (Elfhag, Rössner, Unpublished results). This is in agreement with our assumptions, since a satiety-enhancing treatment poses little demands on the patient’s own abilities and efforts, as the drug works directly on the appetite system in the central nervous system.

An implication for treatment is that posing demands on patients with little prospect of meeting them has obvious risks to result in failure and frustration, for the patient as well as the staff.

On the other hand, and as suggested in study V-VI, patients eating due to needs and drives at onset of the treatment, suggested by oral traits and dependency and also

difficulties with physical demand states, seem to have been better able to assimilate the treatment interventions and profit from the treatment, evidenced by more weight loss. These personality characteristics in the obese patients referred to treatment can imply a more benign treatable condition, in particular for women, and were by us suggested to indicate relatively more neurotic reasons for overeating. Traditional obesity treatments targeting eating behaviour seem to have matched these persons well. As long as active treatment persists, patients with these characteristics could most optimally manage to alter their body weights.

Different kinds of treatment strategies were also suggested for patients with difficulties with emotions or difficulties coping with everyday demands, as described in study I. Patients with difficulties with emotions could need help in understanding emotional influences in eating behaviour. Patients with coping difficulties could rather need help in finding their inner abilities, and forming a structure for eating habits. These patients could perhaps benefit from an approach actively teaching the patient healthier habits and how to carry out changes in everyday behaviour, as well as encouraging and supporting the patients' own ability to manage this. This would, again, imply a treatment that is more ego-supportive.

5.4 LIMITATIONS OF THE STUDIES

A general limitation is the rather small sample sizes, in particular in study V, where a larger sample would have been helpful in further evaluating weight loss with sibutramine. In study III and IV, the sample sizes reflect what is common in such experimental designs.

Gender specific analyses were performed in study VI, and gender distributions were reported for the subgroups of study I. In study II, gender analyses could have been considered for the Rorschach-variables, above reporting gender in relation to body weights. Given larger sample sizes, gender would furthermore have been of interest with regard to eating behaviour in study III and IV.

It is known from epidemiological research that women are more prone to self-report more complaints and less well-being than men²⁴², and this trend is also seen in obesity research²⁵. As a possible self-report gender bias is not applicable to Rorschach data and as Rorschach reference data do not show this type of gender differences¹⁹⁵, gender analyses on Rorschach data of mental distress and other personality aspects related to psychological difficulties would be informative in obese samples.

In study II we examined personality features in relation to body weight. It should be noted that waist hip ratio (WHR) is another measure of obesity. BMI and WHR have earlier been shown to be associated with different personality styles²⁴³, and abdominal obesity has been suggested to be associated with stress^{244,245}. Rorschach characteristics in relation to WHR could therefore have been considered, and may have resulted a different Rorschach associated results.

In study I and II depressive features were studied using Rorschach variables. In study I the Depression Index (DEPI) was used, and in study II, two variables in the DEPI that could be considered crucial for depression in obesity, painful self-inspection and imagery of a damaged body were used to operationally define depression. For

comparative purposes, it would have been desirable to use the same Rorschach measure in both studies. In the non-revised manuscript of study II the variable number of conditions fulfilled in the DEPI was used, and did give similar results as those eventually reported. There was no significant relationship between number of conditions in the DEPI and the BMI.

It has been recommended that Rorschach variables used in research should have good or excellent interrater agreement²⁴⁶. Interrater reliability was good or excellent for all variables used in the study with the exception of one variable, the Coping Deficit Index (CDI), with fair interrater reliability. This implies a liability for study I, where the CDI was used in subdividing the patients. An alternative would have been to use separate variables of the CDI which are considered crucial in capturing these types of difficulties with managing eating and lifestyle, and which did have a higher interrater reliability. Little available psychological resources is one example of such a crucial variable.

The missing data concerning the BDI should also be mentioned. In study II comprising 120 patients, BDI was available only for 78 of the patients, implying 35% missing data. This is a liability, as depressive features were the focus of interest in that study. It should be noted, however, that there were no systematic reasons for the missing data that make us believe the results were affected in any major way. Instead, and as reported in study II, the BDI was included after onset of the study, implying the BDI was not administered to the first 35 patients in the sample. Only 7 of the following 85 patients did not return the questionnaire.

5.5 FUTURE RESEARCH

What is the role of the Rorschach in future research on obesity? Working with the Rorschach is time consuming and it requires extensive training. Therefore it is unlikely to be used on a more general basis. Yet, the Rorschach can contribute with unique information giving an enhanced understanding of the behaviours associated with obesity that are still too little known, and it can give ideas to pursue into further research with other methods. Thus, the Rorschach seems to have a potential role as a complementary method in research on obesity and eating disorders.

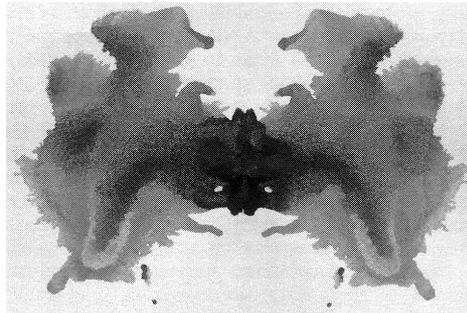
The present database entails data for several more research studies. The eating and obesity history data collected in interviews describe the sample concerning several aspects that could be explored in relation to Rorschach characteristics. Some examples are binge eating and weight cycling. The relationship between WHR and waist circumference and Rorschach derived personality aspects could furthermore be studied as an extension of study II.

Constellations of Rorschach variables used in research on for example alexithymia, or coding the answers according to psychoanalytically influenced Rorschach scales for measuring psychological defences can meet other research questions.

As the Rorschach gives information that is not dependent on self-reports, and there can be a discrepancy between what obese patients say and actually do, it could also be valuable to consider Rorschach data in crucial areas of obesity behaviours where self-reported information has not provided a sufficient understanding. The more underlying characteristics seen in Rorschach data that can have a greater relevance for real life

behaviour could give more knowledge on unrecognised, unavailable or conflicted personality characteristics affecting behaviour.

The results in study I-VI furthermore gave information and suggestions to be pursued into further research exploring areas of potential importance for obesity related behaviours. Examples are the characteristics that are not linked to emotional difficulties or psychological need for food in obesity, but rather represent other types of psychological difficulties in obesity behaviours that are more seldom and less easily recognized. These are distortions in perception and cognition and the personality variables constituting coping capacity, such as psychological resources including available affects and also mental capacity such as imagination and intelligence.



6 CONCLUSIONS

- Depressive features are common in obesity, but being more severely obese is not associated with worse mental distress.
- Obese patients with emotional difficulties can be considered as a subgroup, further characterized by aberrations in eating and experiencing psychological reasons for having a large body.
- The impact of lower bodily concern in the patients with the highest, most health hazardous and physically limiting body weights should be considered.
- Psychological stress overload can affect food intake by forcing the eating rate, and painful emotions may hypothetically be linked to eating for a subgroup of patients.
- Affective responsiveness implying a sensitivity and reactivity to external stimuli can also include food cues and thus be related to a higher appetite.
- Psychological moderators can affect the outcome in experimental designs.
- Obese patients, eating due to physical drives and dependency needs could have particular benefit from treatment interventions targeting satiety and eating habits, resulting in more weight loss.
- Distortions in perception of reality can constitute more severe difficulties in obese eating behaviour and lifestyle that are more difficult to treat in traditional programs.

7 ACKNOWLEDGEMENTS

I wish to express my sincere gratitude to all of those who have contributed to this thesis. Special thanks to:

All the patients who came to participate in the study. This thesis would not have been written without you.

Stephan Rössner for being open-minded and interested in considering Rorschach personality data in the study of obesity, for always taking your time, and for being an encouraging and brilliant tutor on obesity research.

Anna Maria Carlsson for being an excellent supervisor on Rorschach research and methodology, for always challenging me to reach new levels of skill, and for being such a wise person.

Britta Barkeling for being such a positive, supportive and generous co-worker, and for always sharing your knowledge and sincere comments.

Joanna Uddén for believing in the contribution of my work, for providing invaluable support at those times when I needed it the most, and for having a lot of fun.

Pål Rooth for providing a knowledgeable psychiatric perspective for Rorschach data and personality assessment in obesity, as long as you were here. We had so much ahead of us.

The researchers at the Obesity Unit, past and present, for interesting discussions on all research matters.

Our research team for all our forthcoming research. I'm looking forward to it!

Yvonne Linné for lots of help and for so steadfastly making our research visions come true.

Signy Reynirsdottir, Erik Hemmingsson and my co-author Ingalena Andersson.

Mary Hyll for highly professional and careful language revision.

Linda Petré for excellent help with data coding for the questionnaires.

Viveca Larsson-Petré, Lena Mannström, Gunilla Smedberg, Ingrid Forsman and Eva Hedlund for facilitating my work days by being helpful with all kinds of matters.

The nurses and dieticians at the Obesity Unit who have collected body weights and taken care of the patients in the studies.

The treatment staff for discussions on clinical matters and for always striving for more knowledge and treatment improvements.

All the staff for making the Obesity Unit a good working place.

Thomas Lindgren for the time consuming interrater coding agreement, for discussions on coding and for sharing your knowledge and help with research matters.

Harald Janson for being so generous with your time for help with Rorschach research, computer software, and calculation of Rorschach interrater agreement.

Clarence Crafoord for helpful advice on the psychoanalytic theory.

Olle Sundh for enlightening three years of my life with enthusiastic, rich and inspiring teaching on Rorschach and personality diagnostics. I would never have embarked upon this long and awesome path without the passion for Rorschach data you have passed along.

My new Rorschach research encounters through the Society for Personality Assessment: Greg Meyer, Donald Viglione, Mark Hilsenroth and Robert Bornstein for encountering me with interest and encouragement, for providing important help on research issues, and for being progressive bearers of the Rorschach tradition.

8 REFERENCES

1. World Health Organization. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. *World Health Organization Technical Report Series*. 2000;894: i-xiii: 1-253.
2. Aronne, LJ. Classification of obesity and assessment of obesity-related health risks. *Obesity Research*. 2002;10 Suppl 2: 105S-115S.
3. Aronne, LJ & Segal, KR. Adiposity and fat distribution outcome measures: assessment and clinical implications. *Obesity Research*. 2002;10 Suppl 1: 14S-21S.
4. Bjorntorp, P & Rosmond, R. The metabolic syndrome--a neuroendocrine disorder? *British Journal of Nutrition*. 2000;83 Suppl 1: S49-57.
5. National task force on the prevention and treatment of obesity. Overweight, obesity, and health risk. *Archives of Internal Medicine*. 2000;10: 898-904.
6. Grodstein, F, Goldman, MB & Cramer, DW. Body mass index and ovulatory infertility. *Epidemiology*. 1994;5: 247-250.
7. Lean, ME. Pathophysiology of obesity. *Proceedings of the Nutrition Society*. 2000;59: 331-336.
8. Antipatis, VJ & Gill, TP. Obesity as a global problem. in *International textbook of obesity* (ed. Björntorp, P) 3-22 John Wiley & Sons, Ltd, Chichester, 2001.
9. Lissner, L, Johansson, S-E, Qvist, J, Rössner, S & Wolk, A. Social mapping of the obesity epidemic in Sweden. *International Journal of Obesity*. 2000;24: 801-805.
10. Thompson, D & Wolf, AM. The medical-care cost burden of obesity. *Obesity Reviews*. 2001;2: 189-197.
11. Wolf, AM & Colditz, GA. The costs of obesity: the U.S. perspective. *Pharmacoeconomics*. 1994;5: 34-37.
12. Bouchard, C, Pérusse, L, Rice, T & Rao, DC. The genetics of human obesity. in *Handbook of obesity* (eds. Bray, GA, Bouchard, C & James, WPT) 157-190 Marcel Dekker, Inc., New York, 1998.
13. Arner, P. Genetic variance and lipolysis regulation: implications for obesity. *Annals of Medicine*. 2001;33: 542-546.
14. Whitaker, RC, Wright, JAS, Pepe, MS, Seidel, KD & Dietz, WH. Predicting obesity in young adulthood from childhood and parental obesity. *New England Journal of Medicine*. 1997;337: 869-837.
15. van Rossum, CTM, Hoebee, B, Seidell, JC et al. Genetic factors as predictors of weight gain in adult Dutch men and women. *International Journal of Obesity*. 2002;26: 517-528.
16. Sobal, J & Stunkard, AJ. Socioeconomic status and obesity. A review of the literature. *Psychological Bulletin*. 1989;105: 260-275.
17. Lahmann, PH, Lissner, L, Gullberg, B & Berglund, G. Sociodemographic factors associated with long-term weight gain, current body fatness and central adiposity in Swedish women. *International Journal of Obesity*. 2000;24: 685-694.
18. Mokdad, AH, Serdula, MK, Dietz, WH, Bowman, BA, Marks, JS & Koplan, JP. The spread of the obesity epidemic in the United States. *JAMA*. 1999;282: 1519-1522.

19. Rössner, S. Obesity through the ages of man. *International Journal of Obesity*. 2001;25: S29-S33.
20. Sobal, J. Social and cultural influences on obesity. in *International textbook of obesity* (ed. Björntorp, P) John Wiley & Sons, Ltd., Chichester, 2001.
21. Heitmann, BL & Garby, L. Patterns of long term weight changes in overweight developing Danish men and women between 30 and 60 years. *International Journal of Obesity*. 1999;23: 1074-1078.
22. Fontaine, KR, Cheskin, LJ & Allison, DB. Predicting treatment attendance and weight loss: assessing the psychometric properties and predictive validity of the Dieting Readiness Test. *Journal of Personality Assessment*. 1997;68: 173-183.
23. Charles, SC. Psychiatric evaluation of morbidly obese patients. *Gastroenterology Clinics of North America*. 1987;16: 415-432.
24. Lichtman, SW, Pisarska, K, Berman, ER et al. Discrepancy between self-reported and actual caloric intake and exercise in obese subjects. *New England Journal of Medicine*. 1992;327: 1893-1898.
25. Sullivan, M, Karlsson, J, Sjöström, L et al. Swedish obese subjects (SOS) - an intervention study of obesity. Baseline evaluation of health and psychosocial functioning in the first 1743 subjects examined. *International Journal of Obesity*. 1993;17: 503-512.
26. Sullivan, M, Karlsson, J, Sjöström, L & Taft, C. Why quality of life measures should be used in treatment of patients with obesity. in *International Textbook of Obesity* (ed. Björntorp, P) 485-510 John Woley and Sons, Chichester, 2001.
27. Larsson, U, Karlsson, J & Sullivan, M. Impact of overweight and obesity on health related quality of life. *International Journal of Obesity*. 2002;26: 417-424.
28. Ware, JE, Snow, KK, Kosinski, M & Gandek, B. *SF-36 health survey manual and interpretation guide*. Boston, MA: New England Medical Center, The Health Institute, 1993.
29. Heo, M, Allison, D, B, Faith, MS, Zhu, S & Fontaine, KR. Obesity and quality of life: mediating effects of pain and comorbidities. *Obesity Research*. 2003;11: 209-216.
30. Horner, TN & Utermohlen, V. A multivariate analysis of psychological factors related to Body Mass Index and eating preoccupation in female college students. *Journal of the American College of Nutrition*. 1993;12: 459-465.
31. Carpenter, KM, Hasin, DS, Allison, DB & Faith, MS. Relationships between obesity and DSM-IV major depressive disorder, suicide ideation, and suicide attempts: Results from a general population study. *American Journal of Public Health*. 2000;90: 251-257.
32. Puhl, R & Brownell, KD. Bias, discrimination, and obesity. *Obesity Research*. 2001;9: 788-805.
33. Roberts, RE, Delger, S, Strawbridge, WJ & Kaplan, GA. Prospective association between obesity and depression: evidence from the Alameda county study. *International Journal of Obesity*. 2003;27: 514-521.
34. Faith, MS, Matz, PE & Jorge, MA. Obesity -depression associations in the ppopulation. *Journal of Psychosomatic Research*. 2002;53: 935-942.

35. Faith, MS & Allison, DB. Assessment of psychological status among obese persons. in *Body image, eating disorders and obesity* (ed. Thompson, JK) 365-387 American Psychological Association, Washington, 1997.
36. Friedman, MA & Brownell, KD. Psychological correlates of obesity: moving to the next research generation. *Psychological Bulletin*. 1995;117: 3-20.
37. Noppa, H & Hällström, T. Weight gain in adulthood in relation to socioeconomic factors, mental illness, and personality traits: a prospective study of middle aged women. *Journal of Psychosomatic Research*. 1981;25: 83-89.
38. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. DSM-IV. (APA, Washington, DC, 1994).
39. Beck, AT, Steer, AT & Brown, GK. *Beck Depression Inventory - Second edition manual*. San Antonio, TX: The Psychological Corporation, 1996.
40. Harvey, EL, Summerbell, CD, Kirk, SF & Hill, AJ. Dieticians' views of overweight and obese people and reported management practices. *Journal of human nutrition and dietetics*. 2002;15: 331-347.
41. Kaplan, HI & Kaplan, HS. The psychosomatic concept of obesity. *Journal of Nervous and Mental Disease*. 1957;125: 181-201.
42. Bruch, H. Psychological aspects of reducing. *Psychosomatic medicine*. 1952;14: 337-346.
43. Bruch, H. Psychological aspects in overeating and obesity. *Psychosomatics*. 1961;5: 269-274.
44. Babcock, CG. Food and its emotional significance. *Journal of the American Dietetic Association*. 1948;24: 390-393.
45. Hamburger, WW. Emotional aspects of obesity. *Medical Clinics of North America*. 1951;35: 483-499.
46. Bruch, H. Psychological aspects of obesity. *Bulletin of the New York Academy of Medicine*. 1948;24: 73-86.
47. Bruch, H. Developmental obesity and schizophrenia. *Psychiatry*. 1958;21: 65-70.
48. Meyer, JE & Pudal, VE. Experimental studies on food intake in obese and normal weight subjects. *Journal of Psychosomatic Research*. 1972;16: 305-308.
49. Abramson, EE & Wunderlich, RA. Anxiety, fear and eating: A test of the psychosomatic concept of obesity. *Journal of Abnormal Psychology*. 1972;79: 317-321.
50. Reznick, H & Balch, P. The affects of anxiety and response cost manipulations on the eating behaviour of obese and normal subjects. *Addictive Behaviors*. 1977;2: 219-225.
51. Ruderman, A. Obesity, anxiety and food consumption. *Addictive Behaviors*. 1983;8: 235-242.
52. Slochower, J. Emotional labeling and overeating in obese and normal weight persons. *Psychosomatic Medicine*. 1976;38: 131-139.
53. Slochower, J & Kaplan, SP. Anxiety, perceived control, and eating in obese and normal weight persons. *Appetite*. 1980;1: 75-83.
54. Slochower, J, Kaplan, SP & Mann, L. The effects of life stress and weight on mood and eating. *Appetite*. 1981;2: 115-125.

55. Schachter, S. Obesity and eating. Internal and external cues differently affect the eating behavior of obese and normal subjects. *Science*. 1968;161: 751-756.
56. Schachter, S & Gross, L. Manipulated time and eating behavior. *Journal of Personal and Social Psychology*. 1968;10: 91-97.
57. Ross, L. Effects of manipulating the salience of food upon consumption by obese and normal eaters. in *Obese humans and rats* (eds. Schachter, S & Rodin, J) Erlbaum/Halsted, Washington, D.C., 1974.
58. Nisbett, RE. Determinants of food intake in human obesity. *Science*. 1968;159: 1254-1255.
59. Price, JM & Grinker, J. Effects of degree of obesity, food deprivation and palatability on eating behavior in humans. *Journal of Comparative and Physiological Psychology*. 1973;85: 265-271.
60. Rodin, J. Current status of the internal-external hypothesis for obesity. What went wrong? *American Psychologist*. 1981;36: 361-372.
61. Polivy, J & Herman, CP. *Breaking the Diet Habit: The natural weight alternative*. New York: Basic Books, 1983.
62. Herman, CP & Mack, D. Restrained and unrestrained eating. *Journal of Personality*. 1975;43: 647-660.
63. Boschi, V, Iorio, D, Margiotta, N, D'Orsi, P & Falconi, C. The three factor eating questionnaire in the evaluation of eating behaviour in subjects seeking participation in a dietotherapy programme. *Annals of Nutrition and Metabolism*. 2001;45: 72-77.
64. Karlsson, J, Hallgren, P, Kral, J, Lindroos, AK, Sjöström, L & Sullivan, M. Predictors and effects of long-term dieting on mental well-being and weight loss in obese women. *Appetite*. 1994;23: 15-26.
65. Björvell, H, Aly, A, Langius, A & Nordström, G. Indicators of changes in weight and eating behaviour in severely obese patients treated in a nursing behavioural program. *International Journal of Obesity*. 1994;18: 521-525.
66. Stunkard, AJ. Eating patterns and obesity. *Psychiatric Quarterly*. 1959;33: 284-292.
67. de Zwaan, M. Binge eating disorder and obesity. *International Journal of Obesity and Related Metabolic Disorders*. 2001;25: Suppl 1:S51-55.
68. Yanovski, S. Binge eating disorder: Current knowledge and future directions. *Obesity Research*. 1993;2: 205-212.
69. Brody, ML, Walsh, T & Devlin, MJ. Binge eating disorder: Reliability and validity of a new diagnostic category. *Journal of Consulting and Clinical Psychology*. 1994;62: 381-386.
70. Mussell, MP, Mitchell, JE, de Zwaan, M, Crosby, RD, Seim, HC & Crow, SJ. Clinical characteristics associated with binge eating in obese females: a descriptive study. *International Journal of Obesity and Related Metabolic Disorders*. 1996;20: 324-331.
71. Wilson, GT, Nonas, CA & Rosenblum, GD. Assessment of binge eating in obese patients. *International Journal of Eating Disorders*. 1993;13: 25-33.
72. Stickney, MI, Miltenberger, RG & Wolff, G. A descriptive analysis of factors contributing to binge eating. *Journal of Behavior Therapy and Experimental Psychiatry*. 1999;30: 177-189.

73. Gladis, M, Wadden, T, Foster, G, Vogt, R & Wingate, B. A comparison of two approaches to the assessment of binge eating in obesity. *International Journal of Eating Disorders*. 1998;23: 17-26.
74. Hsu, LK, Mulliken, B, McDonagh, B et al. Binge eating disorder in extreme obesity. *Int J Obes Relat Metab Disord* : . 2002;26: 1398-1403.
75. Striegel-Moore, RH, Dohm, FA, Solomon, EE, Fairburn, CG, Pike, KM & Wilfley, DE. Subthreshold binge eating disorder. *International Journal of Eating Disorders*. 2000;27: 270-278.
76. Dingemans, A, Bruna, M & van Furth, E. Binge eating disorder: a review. *International Journal of Obesity and Related Metabolic Disorders*. 2002;26: 299-307.
77. Appolinario, JC, Godoy-Matos, A, Fontenelle, LF et al. An open label trial of sibutramine in obese patients with binge-eating disorder. *Journal of Clinical Psychiatry*. 2002;63: 28-30.
78. Birketvedt, GS, Florholmen, J, Sundsfjord, J et al. Behavioral and neuroendocrine characteristics of the night-eating syndrome. *JAMA*. 1999;282: 657-663.
79. Aronoff, NJ, Geliebter, A & Zammit, G. Gender and body mass index as related to the night-eating syndrome in obese outpatients. *Journal of the American Dietetic Association*. 2001;101: 102-104.
80. Ceru-Bjork, C, Andersson, I & Rossner, S. Night eating and nocturnal eating-two different or similar syndromes among obese patients? *International Journal of Obesity and Related Metabolic Disorders*. 2001;25: 365-372.
81. Gluck, ME, Geliebter, A & Satov, T. Night eating syndrome is associated with depression, low self-esteem, reduced daytime hunger, and less weight loss in obese outpatients. *Obesity Research*. 2001;9: 264-267.
82. Stunkard, AJ, Grace, WJ & Wolff, HG. The night-eating syndrome: a pattern of food intake among certain obese patients. *American Journal of Medicine*. 1955;19: 78-86.
83. Stunkard, A, Berkowitz, R, Wadden, T, Tanrikut, C, Reiss, E & Young, L. Binge eating disorder and the night-eating syndrome. *International Journal of Obesity*. 1996;20: 1-6.
84. Pawlow, LA, O'Neil, PM & Malcolm, RJ. Night eating syndrome: effects of brief relaxation training on stress, mood, hunger, and eating patterns. *International Journal of Obesity and Related Metabolic Disorders*. 2003;27: 970-978.
85. Schenck, CH & Mahowald, MW. Review of nocturnal sleep-related eating disorders. *International Journal of Eating Disorders*. 1994;15: 343-356.
86. Thorpy, MJ (ed.) *The international classification of sleep disorders: diagnostic and coding manual*. Allen Press, Lawrence, KS, 1990.
87. Greeno, CG, Wing, RR & Marcus, MD. Nocturnal eating in binge eating disorder and matched-weight controls. *International Journal of Eating Disorders*. 1995;18: 343-349.
88. Manni, R, Ratti, MT & Tartara, A. Nocturnal eating: prevalence and features in 120 insomniac referrals. *Sleep*. 1997;20: 734-738.
89. Melin, I & Rossner, S. Practical clinical behavioral treatment of obesity. *Patient Education and Counseling*. 2003;49: 75-83.

90. Allison, DB. *Handbook of assessment methods for eating behaviours and weight-related concerns*. Thousand Oaks: Sage Publications, 1995.
91. Wadden, TA. The treatment of obesity. in *Obesity. Theory and therapy* (eds. Stunkard, AJ & Wadden, TA) Raven, New York, 1993.
92. Very low-calorie diets. National Task Force on the Prevention and Treatment of Obesity, National Institutes of Health. *JAMA*. 1993;270: 967-974.
93. Heal, DJ, Aspley, S, Prow, M, Jackson, H, Martin, K & Cheetham, S. Sibutramine: a novel anti-obesity drug. A review of the pharmacological evidence to differentiate it from d-amphetamine and d-fenfluramine. *International Journal of Obesity*. 1998;22: S18-S29.
94. Drent, ML, Larsson, I, William-Olsson, T et al. Orlistat (Ro 18-0647), a lipase inhibitor, in the treatment of human obesity: a multiple dose study. *International Journal of Obesity and Related Metabolic Disorders*. 1995;19: 221-226.
95. Buchwald, H. Overview of bariatric surgery. *Journal of the American College of Surgeons*. 2002;194: 367-375.
96. Mason, EE. Surgery in the obese. *Lancet*. 2003;361: 2001-2002.
97. Wooley, SC & Garner, DM. Obesity treatment: the high cost of false hope. *Journal of the American Dietetic Association*. 1991;91: 1248-1251.
98. Lean, ME. Obesity--what are the current treatment options? *Experimental and Clinical Endocrinology and Diabetes*. 1998;106 Suppl 2: 22-26.
99. Wadden, TA, Foster, GD, Wang, J et al. Clinical correlates of short- and long-term weight loss. *American Journal of Clinical Nutrition*. 1992;56: 27 21S-24S.
100. Wilson, GT. Psychological prognostic factors in the treatment of obesity. in *Recent advances in obesity research: IV* 301-311 John Libbey, London, 1986.
101. Vallis, MT & Ross, MA. The role of psychological factors in bariatric surgery for morbid obesity: identification of psychological predictors of success. *Obesity Surgery*. 1993;3: 346-359.
102. Wing, RR & Hill, JO. Successful weight loss maintenance. *Annual Review of Nutrition*. 2001;21: 323-341.
103. Brownell, KD & Wadden, TA. Etiology and treatment of obesity: Understanding a serious, prevalent and refractory disorder. *Journal of Consulting and Clinical Psychology*. 1992;60: 505-517.
104. Wooley, SC & Garner, DM. Obesity treatment: The high cost or false hope. *Journal of the American Dietetic Association*. 1991;91: 1248-1251.
105. Hjelle, LA & Ziegler, DJ. *Personality theories. Basic assumptions, research and applications*. Tokyo, Japan: Mac Graw-Hill, 1982.
106. Burger, JM. *Personality*. Crawfordsville: Wadsworth, 2000.
107. Weiner, IB. *Principles of Rorschach interpretation*. Mahwah, New Jersey: Lawrence Erlbaum Associates, 1998.
108. Funder, DC. *The personality puzzle*. New York: Norton & Company, 1997.
109. Pervin, LA & Oliver, PJ. *Personality theory and research*. New York: John Wiley & Sons, 2001.
110. Allport, GW. *Personality. A psychological interpretation*. New York: Holt, Reinhart & Winston, 1937.
111. Eysenck, HJ. *Personality genetics and behaviours*. New York: Praeger, 1982.

112. Catell, RB. *Structured personality learning theory*. New York: Praeger, 1983.
113. Murray, HA. *Explorations in personality*. New York: Oxford Univeristy Press, 1938.
114. McAdams, DP. The five-factor model in personality. *Journal of Personality*. 1992;60: 329-361.
115. Mischel, W. *Personality and assessment*. New York: Wiley, 1968.
116. Magnusson, D. Personality development from an interactional perspective. in *Handbook of personality: Theory and research* (ed. Pervin, LA) 193-222 Guilford, New York, 1990.
117. Freud, S. *Standard edition of complete psychological works. 24 vols.* London: The Hogarth Press, 1953-1974.
118. Nisbett, RE & Wilson, TD. Telling more than we can know: Verbal reports on mental processes. *Psychological Review*. 1977;84: 231-259.
119. Kihlstrom, JF. The psychological unconscious. in *Handbook of personality* (ed. Pervin, LA) 445-464 The Guilford Press, New York, 1990.
120. Shervin, H & Dickman, S. The psychological unconscious: A necessary assumption for all psychological theory? *American Psychologist*. 1980;35: 421-434.
121. Kolar, DW, Funder, DC & Colvin, CR. Comparing the accuracy of personality judgements by the self and knowledgeable others. *Journal of Personality*. 1996;64: 311-337.
122. Dahlstrom, WG, Welsh, GS & Dahlstrom, LE. *An MMPI handbook. Vol. 1. Clinical interpretation*. Minneapolis, MN: Univer. of Minnesota Press, 1982.
123. Duckro, PN, Leavitt, J, N, Beal, DG & Chang, AF. Psychological status among female candidates for surgical treatment of obesity. *International Journal of Obesity*. 1983;7: 477-485.
124. Grana, AS, Coolidge, FL & Merwin, MM. Personality profiles in the morbidly obese. *Journal of Clinical Psychology*. 1989;45: 762-765.
125. Lanziera, PJ, DeHorn, A, MacDonald, C, Sroka, C & Fachnie, D. Minnesota multiphasic personality profiles of the morbidly obese. *Henry Ford Hospital Medical Journal*. 1988;36: 78-81.
126. Maddi, SR, Khoshaba, DM, Persico, M, Bleeker, F & VanArsdall, G. Psychosocial correlates of psychopathology in a national sample of the morbidly obese. *Obesity Surgery*. 1997;7: 397-404.
127. Webb, WW, Morey, LC, Castelnuvo-Tedsco, P & Scott, HW. Heterogenity of personality traits in massive obesity and outcome prediction of bariatric surgery. *International Journal of Obesity*. 1990;14: 13-20.
128. Valtolina, G. Weight loss and psychopathology: A three-cluster MMPI typology. *Perceptual and Motor Skills*. 1996;82: 275-281.
129. Riva, G, Ragazzoni, P & Molinari, E. Obesity, Psychopathology and eating attitudes: Are they related? *Eating and Weight Disorders*. 1998;3: 78-83.
130. Lauer, JB, Wampler, R, Lantz, JB & Madura, JA. MMPI profiles of female candidates for obesity surgery: A cluster analytical approach. *Obesity Surgery*. 1996;6: 28-37.

131. Scott, RL & Baroffio, JR. An MMPI analysis of similarities and differences in three classifications of eating disorders: anorexia nervosa, bulimia, and morbid obesity. *Journal of Clinical Psychology*. 1986;42: 708-713.
132. Hutzler, JC, Keen, J, Molinari, V & Carey, L. Super-obesity: A psychiatric profile of patients electing gastric stapling for the treatment of morbid obesity. *Journal of Clinical Psychiatry*. 1981;42: 458-462.
133. Rosen, LW & Aniskiewicz, AS. Psychosocial functioning of two groups of morbidly obese patients. *International Journal of Obesity*. 1983;7: 53-59.
134. Schalling, D & Edman, G. *The Karolinska Scales of Personality (KSP) manual: An inventory for assessing temperamental dimensions associated with vulnerability for psychosocial deviance*. Stockholm, Sweden: Department of Psychiatry, Karolinska Institutet, 1993.
135. Björvell, H, Edman, G, Rössner, S & Schalling, D. Personality traits in a group of severely obese patients in two self-chosen weight reducing programs. *International Journal of Obesity*. 1985;9: 257-266.
136. Palme, G & Palme, J. Personality characteristics of females seeking treatment for obesity, bulimia nervosa and alcoholic disorders. *Personality and Individual Differences*. 1999;26: 255-263.
137. Jönsson, B, Björvell, H, Levander, S & Rössner, S. Personality traits predicting weight loss outcome in obese patients. *Acta Psychiatrica Scandinavica*. 1986;74: 384-387.
138. Poston, WS, 2nd, Ericsson, M, Linder, J, Nilsson, T, Goodrick, GK & Foreyt, JP. Personality and the prediction of weight loss and relapse in the treatment of obesity. *International Journal of Eating Disorders*. 1999;25: 301-309.
139. Eysenck, HJ & Eysenck, SBG. *Manual of the Eysenck Personality Inventory*. London: University of London Press, 1964.
140. Hällström, T & Noppa, H. Obesity in women in relation to mental illness, social factors and personality traits. *Journal of Psychosomatic Research*. 1981;25: 75-82.
141. Faith, MS, Flint, J, Fairburn, CG, Goodwin, GM & Allison, DB. Gender differences in the relationship between personality dimensions and relative body weight. *Obesity Research*. 2001;9: 647-650.
142. Murray, HA. *The Thematic Apperception Test manual*. New York: Oxford university press, 1943.
143. Bellak, L & Sorel Bellak, S. *Childrens Apperception Test (C.A.T.)*. Larchmont, N Y: C.P.S. CO., 1961.
144. Phillipson, H. *A short introduction to the Object Relations Technique*. Oxford: NFER-NELSON, 1973.
145. Kragh, U & Smith, G. *Percept-genetic analysis*. Lund: Gleerups, 1970.
146. Machover, K. *Personality projection in the drawing of human figure: a method of personality investigation*. Springfield, Ill: Thomas, 1949, pr. 1968.
147. Buch, JN. *The house tree person technique*. Los Angeles, CA: Western psychological services, 1996.
148. Rorschach, H. *Psychodiagnostik*. Bern: Bircher, 1921.
149. Exner, JE. *The Rorschach: A comprehensive system. Volume 1. Basic foundations and principles of interpretation*. 4th ed. New York: John Wiley & Sons, 2003.

150. Meyer, GJ & Archer, RP. The hard science of Rorschach research: what do we know and where do we go? *Psychological Assessment*. 2001;13: 486-502.
151. Bornstein, RF. Clinical utility of the Rorschach Inkblot Method: reframing the debate. *Journal of Personality Assessment*. 2001;77: 39-47.
152. Exner, JE. *The Rorschach: A comprehensive system. Volume 2. Current research and advanced Interpretation*. 2nd ed. New York: John Wiley & Sons, 1991.
153. Exner, JE. *The Rorschach: A comprehensive system. Volume 1. Basic foundations*. 3rd ed. New York: John Wiley & Sons, 1993.
154. Binet, A & Henri, V. La psychologie individuelle. *Annee Psychologique*. 1895-1896;2: 411-465.
155. Dearborn, G. Blots of ink in experimental psychology. *Psychological Review*. 1897;4: 390-391.
156. Dearborn, G. A study of imaginations. *American Journal of Psychology*. 1898;9: 183-190.
157. Kirkpatrick, EA. Individual tests of school children. *Psychological Review*. 1900;7: 274-280.
158. Parsons, CJ. Children's interpretation of inkblots: A study on some characteristics of children's imagination. *British Journal of Psychology*. 1917;9: 74-92.
159. Pyle, WH. *Examination of school children*. New York: Macmillan, 1913.
160. Pyle, WH. A psychological study of bright and dull children. *Journal of Educational Psychology*. 1915;17: 151-156.
161. Rybakov, T. *Atlas for experimental research on personality*. Moscow, Russia: University of Moscow, 1911.
162. Whipple, GM. *Manual of mental and physical tests (Vols. 1 & 2)*. Baltimore: Warwick & York, 1914.
163. Rorschach, H & Oberholzer, E. The application of the form interpretation test to psychoanalysis. *Zeitschrift für die Gesamte Neurologie und Psychiatrie*. 1923;82: 240-274.
164. Klopfer, B & Sender, S. A system of refined scoring symbols. *Rorschach Research Exchange*. 1936;1: 19-22.
165. Beck, SJ. Autism in Rorschach scoring. *Character and Personality*. 1936;5: 83-85.
166. Beck, SJ. *Rorschach's test I: Basic processes*. New York: Grune & Stratton, 1944.
167. Beck, SJ. *Rorschach's test II: A variety of personality pictures*. New York: Grune & Stratton, 1945.
168. Beck, SJ. *Rorschach's test III: Advances in interpretation*. New York: Grune & Stratton, 1952.
169. Klopfer, B, Meyer, MM, Brawer, FB & Klopfer, WG. *Developments in the Rorschach technique. III: Aspects of personality structure*. New York: Harcourt Brace Jovanovich, 1970.
170. Klopfer, B, Ainsworth, MD, Klopfer, WG & Holt, RR. *Developments in the Rorschach technique. I: Technique and theory*. Yonkers-on-Hudson, NY: World Books, 1954.
171. Klopfer, B. *Developments in the Rorschach technique. II: Fields of application*. Yonkers-on-Hudson, NY: World Books, 1956.

172. Hertz, MR. *Frequency tables for scoring Rorschach responses*. Cleveland, OH: Western Reserve University Press, 1952.
173. Piotrowski, Z. *Perceptanalysis*. New York: Macmillan, 1957.
174. Rapaport, D, Gill, M & Schafer, R. *Diagnostic psychological testing (Vols. 1 & 2)*. Chicago: Yearbook Publishers, 1946.
175. Bohm, E. *Lehrbuch der Rorschach Psychodiagnostik*. Bern, Switzerland: Huber, 1957.
176. Exner, JE. *The Rorschach systems*. New York: Grune & Stratton, 1969.
177. Exner, JE. *The Rorschach: A Comprehensive System. Volume 1*. New York: Wiley, 1974.
178. Viglione, DJ. *Rorschach coding solutions*. San Diego: Donald J Viglione, 2002.
179. Hilsenroth, MJ, Fowler, JC & Padawer, JR. The Rorschach Schizophrenia Index (SCZI): an examination of reliability, validity, and diagnostic efficiency. *Journal of Personality Assessment*. 1998;70: 514-534.
180. Krishnamurthy, R & Archer, RP. An evaluation of the effects of Rorschach EB style on the diagnostic utility of the Depression Index. *Assessment*. 2001;8: 105-109.
181. Viglione, DJ, Perry, W, Jansak, D, Meyer, G & Exner, JE. Modifying the rorschach human experience variable to create the human representational variable. *Journal of Personality Assessment*. 2003;81: 64-73.
182. Porcelli, P & Meyer, GJ. Construct validity of Rorschach variables for alexithymia. *Psychosomatics*. 2002;43: 360-369.
183. Meyer, GJ, Hilsenroth, MJ, Baxter, D et al. An examination of interrater reliability for scoring the Rorschach Comprehensive System in eight data sets. *Journal of Personality Assessment*. 2002;78: 219-274.
184. Viglione, DJ & Taylor, N. Empirical support for interrater reliability of Rorschach Comprehensive System coding. *Journal of Clinical Psychology*. 2003;59: 111-121.
185. Lerner, PM. *Psychoanalytic theory and the Rorschach*. Hillsdale, NJ: The analytic press, 1991.
186. Masling, J & Rabie, L. Obesity, level of aspiration, and Rorschach and TAT measures of oral dependence. *Journal of Consulting Psychology*. 1967;31: 233-239.
187. Bornstein, RF. Construct validity of the Rorschach Oral Dependency Scale: 1967-1995. *Psychological Assessment*. 1996;8: 200-205.
188. Mattlar, C-E. The Rorschach system is a reliable, valid, and cost-effective. *Roschachiana*. 2003;25.
189. Wood, JM, Nezworski, MT, Stejskal, WJ, Garben, S & West, SG. Methodological issues in evaluating Rorschach validity: A comment on Burns and Viglione (1996), Weiner (1996) and Ganellen (1996). *Assessment*. 1999;6: 115-129.
190. Viglione, DJ & Hilsenroth, MJ. The Rorschach: Facts, fiction and future. *Psychological Assessment*. 2001;13: 452-471.
191. Meyer, GJ, Finn, SE, Eyde, L et al. Psychological testing and psychological assessment: a review of evidence and issues. *American Psychologist*. 2001;56: 128-165.

192. Garb, HN, Wood, JM, Nezworski, MT, Grove, WM & Stejskal, WJ. Toward a resolution of the Rorschach controversy. *Psychological Assessment*. 2001;13: 433-448.
193. Wood, JM, Nezworski, MT & Stejskal, WJ. The comprehensive system for the Rorschach: A critical examination. *Psychological Science*. 1996;7: 3-10.
194. Viglione, DJ. A review of recent research addressing the utility of the Rorschach. *Psychological Assessment*. 1999;11: 251-265.
195. Exner, JE. *A Rorschach workbook for the Comprehensive System. Fifth edition*. Asheville, North Carolina: Rorschach Workshops, 2001.
196. Wood, JM, Nezworski, MT, Garb, HN & Lilienfeld, SO. The misperception of psychopathology: Problems with the norms of the comprehensive system for the Rorschach. *Clinical Psychology: Science and Practice*. 2001;8: 350-373.
197. Weiner, IB. Considerations in collecting Rorschach reference data. *Journal of Personality Assessment*. 2001;77: 122-127.
198. Exner, JE. A new non-patient sample for the Rorschach Comprehensive System: A progress report. *Journal of Personality Assessment*. 2002;78: 391-404.
199. Stricker, G & Gold, JR. The Rorschach: Toward a nomothetically based, idiographically applicable configurational model. *Psychological Assessment*. 1999;11: 240-250.
200. McLelland, DC. Biological aspects of human motivation. in *Motivation, intention and volition* (eds. Halisch, F & Kuhl, J) 11-19 Springer-Verlag, New York, 1987.
201. Yoshida, S, Murano, S, Saito, Y et al. Treatment of obesity by personality classification-oriented program. *Obesity Research*. 1995;3: Suppl 2:205s-209s.
202. Clerici, M, Albonetti, S, Papa, R, Penati, G & Invernizzi, G. Alexithymia and obesity. *Psychotherapy and Psychosomatics*. 1992;57: 88-93.
203. Mattlar, C-E, Salminen, JK & Alanen, E. Rorschach findings for the extremely obese: Results from a two-year reducing programme. *British Journal of Projective Psychology*. 1989;34: 2-27.
204. Semenoff, B. *Projective Techniques*. London: Wiley, 1976.
205. Mattlar, C-E. *Finnish Rorschach responses in cross-cultural context: a normative study*. Jyväskylä: Jyväskylä Studies in Education, Psychology and Social Research, 58, 1986.
206. Klopfer, B & Davidson, HH. *The Rorschach technique. An introductory manual*. New York: Harcourt, Brace & World, 1962.
207. Masling, JM. Orality, pathology and interpersonal behavior. in *Empirical studies of psychoanalytic theories* (ed. Masling, J) Erlbaum, Hillsdale, NJ, 1986.
208. Bornstein, RF & Greenberg, RP. Dependency and eating disorders in female psychiatric inpatients. *Journal of Nervous and Mental Disease*. 1991;179: 148-152.
209. Narduzzi, KJ & Jackson, T. Personality differences between eating-disordered women and a nonclinical comparison sample: A discriminant classification analysis. *Journal of Clinical Psychology*. 2000;56: 699-710.
210. Piran, N. Borderline phenomena in anorexia nervosa and bulimia. in *Primitive mental states and the Rorschach* (eds. Lerner, H & Lerner, P) 363-376 International Universities Press, Madison, Connecticut, 1990.

211. Sugarman, A, Quinlan, DM & Devenis, L. Ego boundary disturbance in anorexia nervosa: preliminary findings. *Journal of Personality Assessment*. 1982;46: 455-461.
212. Parmer, JC. Bulimia and object relations: MMPI and Rorschach variables. *Journal of Personality Assessment*. 1991;56: 266-276.
213. Small, A, Madero, J, Teagno, L & Ebert, M. Intellect, perceptual characteristics and weight gain in anorexia nervosa. *Journal of Clinical Psychology*. 1983;39: 780-782.
214. Smith, J, Hillard, M & Walsh, R. Rorschach assessment of purging and non-purging bulimics. *Journal of Personality Assessment*. 1991;56: 277-288.
215. Allison, DB & Heshka, S. Social desirability and response bias in self-reports of "emotional eating". *Eating Disorders*. 1993;1: 31-38.
216. Allison, DB & Heshka, S. Emotion and eating in obesity? A critical analysis. *International Journal of Eating Disorders*. 1993;13: 289-295.
217. Morey, LC & Kurtz, JE. Assessment of general personality and psychopathology among persons with eating and weight-related concerns. in *Handbook of Assessment Methods for Eating Behaviours and Weight-Related Concerns* (ed. Allison, DB) 1-22 Sage Publications, Thousand Oaks, 1995.
218. Janson, H. Rorschach Research Utilities. 0.9.3 edn ([Unpublished computer software]. University of Oslo, Institute of psychology, Oslo (Norway), 2002).
219. Janson, H & Olsson, U. A measure of agreement for interval or nominal multivariate observations. *Educational and Psychological Measurements*. 2001;61: 277-289.
220. Chicchetti, DV & Sparrow, SS. Developing criteria for establishing interrater reliability of specific items: Applications of assessment of adaptive behavior. *American Journal of Mental Deficiency*. 1981;86: 127-137.
221. Shrout, P & Fleiss, J. Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin*. 1979;86: 420-428.
222. Beck, AT, Ward, CH, Mendelson, M, Mock, J & Erlbaugh, J. An inventory for measuring depression. *Archives of General Psychiatry*. 1961;4: 561-571.
223. Kissileff, HR, Klingsberg, G & Van Itallie, TB. Universal eating monitor for continuous recording of solid or liquid consumption in man. *American Journal of Physiology*. 1980;238: R14-R22.
224. Barkeling, B, Rössner, S & Björvell, H. Effects of a high-protein meal (meat) and a high-carbohydrate meal (vegetarian) on satiety measured by automated computerized monitoring of subsequent food intake, motivation to eat and food preferences. *International Journal of Obesity*. 1990;14: 743-751.
225. Barkeling, B, Rössner, S & Sjöberg, A. Methodological studies on single meal food intake characteristics in normal weight and obese men and women. *International Journal of Obesity*. 1995;19: 284-290.
226. Swedish socioeconomic classification. (Statistics Sweden, Örebro, 1995 (1982:4)).
227. National task force on the prevention and treatment of obesity. Weight cycling. *JAMA*. 1994;272: 1196-1202.

228. Curran, PJ, West, SG & Finch, JF. The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods*. 1996;1: 16-29.
229. Cohen, J. *Statistical power analysis for the behaviour sciences (2nd ed.)*. Hillsdale, NJ: Lawrence Erlbaum Associates, 1988.
230. Fitzgibbon, ML, Stolley, MR & Kirschenbaum, DS. Obese people who seek treatment have different characteristics than those who do not seek treatment. *Health Psychology*. 1993;12: 342-345.
231. Furnham, A & Baguma, P. Cross-cultural differences in the evaluation of male and female body shapes. *International Journal of Eating Disorders*. 1994;15: 81-89.
232. Jeffery, RW, French, SA, Forster, JL & Spry, VM. Socioeconomic status differences in health behaviours related to obesity: the healthy worker project. *International Journal of Obesity*. 1991;15: 689-696.
233. Schachter, S. Some extraordinary facts about obese humans and rats. *American Psychologist*. 1971;26: 129-144.
234. Fancher, RE. *Psychoanalytic psychology. The development of Freud's thought*. New York: W.W. Norton & Company, 1973.
235. Pine, F. *Drive, ego, object & self. A synthesis for clinical work*. New York: Basic Books, 1990.
236. Kellerman, H & Burry, A. *Handbook of psychodiagnostic testing. Personality analysis and report writing*. Orlando, FL: Grune & Stratton, 1981.
237. Bartell, S & Solanto, M. Usefulness of the Rorschach inkblot test in assessment of attention deficit hyperactivity disorder. *Perceptual and Motor Skills*. 1995;80: 531-541.
238. Cotugno, A. Personality attributes of attention deficit hyperactivity disorder (ADHD) using the Rorschach inkblot test. *Journal of Clinical Psychology*. 1995;51: 554-562.
239. Hartmann, E, Sunde, T, Kristiensen, W & Martinussen, M. Psychological measures as predictors of military training performance. *Journal of Personality Assessment*. 2003;80: 87-98.
240. Blanck, G & Blanck, R. *Ego psychology - theory and practice*. Columbia University Press, 1974.
241. McWilliams, N. *Psychoanalytic Diagnosis*. New York: Guilford Press, 1994.
242. Tibblin, G, Bengtsson, C, Furunes, B & Lapidus, L. The population studies of men and women in Gothenburg. *Scandinavian Journal of Primary Health Care*. 1990;8: 9-17.
243. Lapidus, L, Bengtsson, C, Hällström, T & Björntorp, P. Obesity, adipose tissue distribution and health in women - results from a population study in Gothenburg, Sweden. *Appetite*. 1989;12: 25-35.
244. Björntorp, P. Endocrine abnormalities of obesity. *Metabolism: Clinical and Experimental*. 1995;44: 21-23.
245. Björntorp, P. Do stress reactions cause abdominal obesity and comorbidities? *Obesity Reviews*. 2001;2: 73-86.

246. Weiner, IB. Variable selection in Rorschach research. in *Issues and Methods in Rorschach Research* (ed. Exner, JE) 73-97 Lawrence Erlbaum Associates, Mahwah, New Jersey, 1995.