

# Body image in eating disorders

Integrating aesthetic and functional body experience



Marlies Rekkers

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# **Body image in eating disorders**

## Integrating aesthetic and functional body experience

**Lichaamsbeleving bij eetstoornissen**  
Naar een integratie van esthetische en functionele aspecten

(met een samenvatting in het Nederlands)

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give me laugh lines and wrinkles  
i want proof of the jokes we shared  
engrave the line into my face like  
the roots of a tree that grow deeper  
with each passing year  
i want sunspots as souvenirs  
for the beaches we laid on  
i want to look like I was  
never afraid to let the world  
take me by the hand  
and show me what it's made of  
i want to leave this place knowing  
i did something with my body  
other than trying to  
make it look perfect

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## **Chapter 1**

### **General Introduction**

In high school, I loved to play sports and I realized that none of my uncertainties - how I looked, whether I was attractive enough, etc. - bothered me anymore while playing softball or tennis. I was in a different world where my concerns about my appearance did no longer exist or had lost their importance. As a psychologist and psychomotor therapist, I worked for almost 28 years with people with eating disorders (EDs). What struck me was their immense dissatisfaction with their own appearance and their incapacity to deal with it. I started to realize how important it is to address this huge lack of satisfaction with their body and to create contexts that facilitate change and create more appreciation for the body that is so much part of one's identity.

Inspired by the experimental studies by Jansen et al. (2005) and Smeets et al. (2011), we developed a treatment protocol based on selective visual attention for positively experienced body parts: the protocol Positive Body Experience (PBE; Rekkers & Van Gulik, 2018). The focus of this protocol is positive body exposure. Over the years, while finetuning this protocol, it became apparent that a shift from negative to positive body experience would not suffice, it was also necessary to help patients change their predominantly appearance-related focus into a more functional perspective of their body. New publications on the subject (Abbot & Barber, 2010; Alleva et al., 2015; Frisén & Holmqvist, 2010; Mulgrew & Tiggemann, 2016) supported this adjustment. However, while the scientific interest in the concept functional body image as an important ingredient of positive body image has increased recently (Alleva & Tylka, 2021; Linardon et al., 2023), little is known about the therapeutic applicability and effectiveness of body functionality to mitigate body dissatisfaction in the field of EDs.

The aim of this thesis is to improve and expand knowledge related to assessment and treatment of body dissatisfaction. Particular emphasis will be on the role of body functionality in mitigating body dissatisfaction in EDs, in an effort to answer the question: Does shifting the focus from a negative aesthetic evaluation of one's own body to a positive functional and aesthetic evaluation, help people to deal better with their ED? In this introduction, I will present the main ideas and debates that led to the studies that form the core of this and findings of this thesis and its underlying concepts and approaches.

### **Eating disorders: State of the art**

EDs place individuals at risk of serious health problems and are associated with significant psychosocial impairment, high comorbidity and elevated mortality rates (Keski-Rahkonen &

Mustelin, 2016; Van Eeden et al., 2021; Schaefer & Thompson, 2018; Tseng et al., 2023). Of all common psychiatric disorders, EDs have the highest levels of mortality and also high levels of morbidity (Hoek, 2006, 2016; Micali & Herle, 2022). Disturbance of eating habits and extreme concern about body weight or shape are the characteristic features of people with EDs. The most common types of EDs are anorexia nervosa (AN), bulimia nervosa (BN) and binge eating disorder (BED). According to the 5<sup>th</sup> edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5 TR; American Psychiatric Association (APA), 2022), the diagnostic criteria of AN are: persistent restriction of energy intake leading to low body weight; an obsessive fear of gaining weight; persistent behaviour to prevent weight gain. Common features are also the lack of recognition of the seriousness of the current low body weight, a negative attitudinal body image and/or a disturbance in the way one's body weight or shape is perceived.

A negative and/or disturbed body image, when “self-evaluation is unduly influenced by body shape and weight”, is one of the diagnostic criteria for BN as well (APA, 2022). BN is characterized by recurrent episodes of binge eating and inappropriate compensatory behaviour to prevent weight gain, such as self-induced vomiting, misuse of laxatives, diuretics or other medications, fasting or excessive exercise (APA, 2022). Like BN, BED is characterized by recurrent episodes of binge eating, but without the inappropriate compensatory behaviours. BED often leads to overweight and is accompanied by high levels of stress (especially feelings of guilt, shame and disgust of one's own behaviour), psychosocial impairment and components of the metabolic syndrome (Cooper et al., 2020). Although the over-evaluation of shape and weight required for a diagnosis of AN and BN is not required for BED, body dissatisfaction is also clearly present in BED (Lewer et al., 2017). Besides AN, BN and BED, there are two additional DSM-5 TR ED categories: other specified feeding or eating disorder (OSFED), which is used when the diagnostic criteria do not fully meet the criteria of AN, BN or BED; and unspecified feeding or eating disorder (UFED), which can be used as a temporary classification, until a final classification can be made.

With a substantial proportion of young people reporting an ED, in Western societies, more young women than young men have experienced a DSM-5 ED by early adulthood 5.5-17.9% vs 0.6–2.4% (Silen & Keski-Rahkonen, 2022). Men with EDs differ somewhat from women as premorbid overweight is more common in men than in women and body dissatisfaction in men often focuses on both weight and muscularity concerns. Furthermore, athletic achievement and excessive exercise appear crucial features among men (Raevuori et al., 2014).

Keski-Rahkonen and Mustelin (2016) reported that, although the numbers of individuals receiving treatment have increased, only about one-third of people with EDs are treated by healthcare providers. Factors as denial, stigma, shame and fear that one's disorder is not serious enough hamper treatment seeking, causing the majority of people with EDs to remain out of formal healthcare systems or present themselves at late stages (Dane & Bhatia, 2023). In a study in which data of twelve mental health disorders were analysed from 1990 to 2019 (Piao et al., 2023), EDs show the second highest absolute increase in incidence (age standardized rate from 175.83 in 1990 to 216.02 in 2019 per 100.000). EDs were second only to depressive disorders and showed the highest percentage increase (22.9%). Over 70% of individuals with EDs report comorbid psychiatric disorders or symptoms (Keski-Rahkonen & Mustelin, 2016), such as anxiety disorders (up to 62%), mood disorders (up to 54%) and substance use and post-traumatic stress disorders (up to 27%) (Hambleton et al., 2022).

In this context, Erskine et al. (2016) speak of the global burden of EDs, young people are the highest risk group for developing an ED, which seriously limits their physical, mental and social development. Furthermore, EDs typically last for many years, often lead to a prolonged course and can have a long-lasting and pervasive effect on all bodily systems and organs (Micali & Herle, 2022). Finally, EDs cause family burdens: seriously affect the relationship with but also the lives of relatives, in particular caregivers (parents) and offspring as well and lead to financial burdens, involving treatment costs and loss of earnings for both patients and caregivers (Van Hoeken & Hoek, 2020).

### **Treatment of EDs**

Despite the effects of EDs and the efforts to establish empirically based methods to reduce the consequences of the disorder, there is still a relative lack of evidence-based knowledge about the treatment of EDs in particular AN. There is no convincing evidence to suggest that any psychological or pharmacological treatment consistently produces good outcomes for adults with AN versus treatment as usual (Solmi et al., 2021). Nor is there evidence pointing to the superiority of any specific treatment, apart from family therapy interventions, which show some efficacy in young adults (Monteleone et al., 2022; Zipfel et al., 2015). Byrne et al. (2017) compared three psychological treatments for AN: Specialist Supportive Clinical Management (SSCM), Maudsley Model Anorexia Nervosa Treatment for Adults (MANTRA) and Enhanced Cognitive Behavioural Therapy (CBT-E). They found no significant differences between the treatments; all resulted in clinically significant improvements in BMI,

eating disorder psychopathology, general psychopathology and psychosocial impairment. These results were maintained over 12-month follow-up. Also, there were no significant differences between the treatments with regard to the achievement of a healthy weight (50%) or remission (28.3%) at a 12-month follow-up. These results underscore the need for continued efforts to improve outpatient treatments (Byrne et al., 2017) and a strong need for more well-designed treatment studies for AN (Hoek, 2015; Monteleone et al., 2022).

In contrast with studies on AN, there are a large number of randomized controlled trials (RCTs) as well as systematic reviews and meta-analyses for BN and BED. First-line treatment for BN and BED in adults is an individual psychological therapy with the best evidence for cognitive behavioural therapy (CBT), but interpersonal psychotherapy is also a well-established therapy for these disorders (Hoek, 2015). In the past years CBT-E (Fairburn, 2008) has been found the most efficacious (De Jong et al., 2018; Monteleone et al., 2022).

Despite this, all current behavioural approaches leave a proportion of people with EDs symptomatic or at a high risk of relapse. In a systematic review Berends et al. (2018) found an overall estimated rate of relapse of 31% in AN. They distinguished four main clusters of factors associated with relapse in AN: ED variables, comorbidity symptoms, process treatment variables and demographic variables. Within the cluster of ED variables, those related to weight and shape concern were most prominent. Fairburn et al. (2003) consider the negative and/or disturbed body image as the primary maintaining factor and the ‘core psychopathology’ of all EDs. Negative and/or disturbed body image and its behavioural consequences influence the development, persistence and relapse of the ED. This underlines the significance of paying attention to body image in the treatment of EDs and the need for the development of novel approaches to better target this core symptom of EDs (Muratore & Attia, 2021).

In the treatment of body dissatisfaction, body exposure is a widely used approach. During body exposure, patients stand in front of a mirror and look at their body, while being stimulated by the therapist to describe what they see, and what they think and feel about it (Jansen et al., 2013). Griffen et al. (2018) recommend it for the treatment of negative body image and conclude that there are several variations of body exposure therapy. Partly due to the use of different names in the literature for these variations, it is not always easy to establish which kind of body exposure is applied. *Pure*, *mere* or *negative* body exposure refer to a focus on negatively experienced body parts (Jansen et al., 2013, 2016; Key et al., 2002; Moreno-Domínguez et al., 2012). In *guided*, *non-judgmental*, *neutral* or *mindful* body exposure the participants have to describe their body in a neutral and objective manner

(Delinsky & Wilson, 2006; Diaz-Ferrer et al., 2017; Tuschen-Caffier & Florin, 2002). During *cognitive dissonance-based* or *positive* body exposure, attention is exclusively focused on the positively experienced body parts (Glashouwer et al., 2016; Jansen et al., 2013, 2016; Luethcke et al., 2011; Tanck et al., 2022). Except for a single study in women with BN (Díaz-Ferrer et al., 2015), all studies comparing body exposure modalities used body dissatisfied women as subjects (Griffen et al., 2018).

It is striking that most of the research on body exposure is conducted in non-clinical samples. Klimek et al. (2020) highlight this gap in body exposure literature and advocate for further clinical trials assessing body exposure. Also, Tanck et al. (2022) concluded that evidence on the effectiveness of different forms of body exposure in clinical populations is lacking and also make a plea for more studies. To enhance treatment and to facilitate clinical trials, these recommendations also emphasize the need for body exposure protocols, that describe the manner in which body exposure is used, how the sessions are structured and other characteristics like how many sessions are recommended.

### **Body image in EDs**

In the discussion on the role of body exposure in EDs, the concept of body image itself is fundamental. Gardner (2011) makes a distinction between a perceptual and an attitudinal dimension of body image. *Perceptual body image* refers to visual and tactile somatosensory perception, that is the way the body is seen and felt. In EDs this perception is often disturbed, especially in people with AN (Keizer et al., 2011, 2012). Keizer et al. (2013) found that people with AN not only perceive that they are fat by misjudging their real body size, even their unconscious motor behaviour is consistent with such perceptions. Within the *attitudinal dimension*, the body image of people with an ED is characterized by negative feelings, cognitions and behaviours regarding the aesthetics of one's body. Patients report an intense dissatisfaction with their bodies or with parts of their bodies. They believe their bodies or body parts fat and ugly. This can express itself by comparing one's appearance negatively with that of others (Laker & Waller, 2020; Leahey et al., 2011), criticizing and objectifying one's body (Calogero et al., 2005; Schaefer, & Thompson, 2018), frequently checking (Reas et al, 2002) and/or avoiding to look at or touch the body (Rosen et al., 1991).

In the field of EDs a disturbed body image is defined as a misperception of body size and shape. In addition, we speak of a negative body image, when it is associated with the attitudinal dimension (Rekkers et al., 2019). In the present thesis we will focus on the

assessment and treatment of a negative body image. Body exposure therapy is targeting the attitudinal dimension in an effort to reduce negative body image. In the field of EDs, negative body image is predominantly linked to appearance and weight concerns, but we follow Gaete and Fuchs (2016) in their suggestion that body image should be defined broader. In fact, the concept of body image may benefit from such a broader definition. Besides aesthetic experience, such as thoughts and feeling about bodily appearance, the concept also includes bodily awareness and functional and tactile experiences of the body. To emphasize this multidimensional nature, we prefer with Scheffers et al. (2017) to use the term body experience, instead of body image.

### **Functional body experience**

Functional body experience relates to the thoughts and feelings of a person about the functioning of his or her own body. Alleva et al. (2017) introduced the term ‘body functionality’ and defined this as everything the body can do or is capable of doing, such as physical abilities, internal processes, bodily senses and perceptions, creative endeavours and communication with others. A growing number of studies has investigated the features, correlates, and outcomes of body functionality to show that it can serve as an important ingredient of positive body experience (Alleva et al., 2019; Alleva et al., 2014; Frisé & Holmqvist, 2010; Wood-Barcalow et al., 2010). Linardon et al. (2023) conclude that functional body appreciation could serve as a potentially important and useful target for intervention. Alleva and Tylka (2021) state that research underscores body functionality as a valuable dimension with respect to body satisfaction and disordered eating. However, all these findings are predominantly based on non-clinical studies. Little is known about the role of body functionality in the treatment of body dissatisfaction in the field of EDs. It is important to investigate whether focusing on body functionality does lead to a less negative body experience. For this reason, measurement instruments are needed, validated in both non-clinical and clinical ED samples, to evaluate the role and influence of body functionality as a separate dimension of body experience.

### **Assessment of body experience**

In the field of EDs, several measures have been developed and validated to assess body experience, encompassing both body satisfaction and body attitude (attitudinal body



experience). Most of these instruments are self-report questionnaires, such as the Body Attitude Test (BAT; Probst et al., 1995a), the Body Shape Questionnaire (BSQ; Cooper et al., 1987), the Physical Appearance State and Trait Anxiety Scale (PASTAS; Reed et al, 1991) and the Multidimensional Body–Self Relations Questionnaire (Brown et al., 1990). All of these, however, focus on aesthetic body experience. Outside the field of EDs, questionnaires have been presented with a broader scope such as the Body Cathexis Scale (BCS; Tucker, 1981), which measure both aesthetic body experience and body functionality and the Functionality Appreciation Scale (FAS; Alleva et al., 2017), which exclusively measures the construct of body functionality. These two questionnaires are very useful to improve our knowledge and to enhance awareness and knowledge of professionals and people with an ED about body functionality, but they need clinical validation.

### **Psychomotor therapy and body experience in ED**

Psychomotor therapy (PMT) is a body- and movement-oriented therapy much used in mental health care in the Netherlands and Belgium. PMT focuses on developing a healthy and positive relationship with the body and represents a suitable form of therapy to treat negative and disturbed body experience. This focus has given rise to a treatment tradition of PMT in EDs in the Netherlands and Belgium (Butcher & Probst, 2019; Keizer et al., 2019; Probst, 1997; Probst et al., 1995b, 2013; Rekkers, 2005; Rekkers & Boerhout, 2018; Rekkers & Schoemaker, 2002; Rekkers & Van Gulik, 2018; Vandereycken et al., 1988). Building on this tradition, we developed the protocol PBE which focuses on enhancing positive body experience by means of positive body exposure. Body exposure in this protocol is not limited exclusively to aesthetic aspects but also focuses on body functionality to strengthen positive body experience, which could be a new promising approach.

### **Aim of this thesis**

In line with the ideas presented above two main issues need further development if we want to enhance insight in effective treatment of EDs. In the first place, questionnaires about body satisfaction, especially body functionality need further clinical validation to facilitate research of body experience therapy. Secondly, body exposure protocols have to be developed and evaluated to better target negative body experience in EDs. In the present thesis, we will make a contribution to these interrelated challenges. We will focus both on assessment and

treatment of negative body experience in EDs, starting with psychometric evaluation of assessment questionnaires that measure body satisfaction and functional appreciation. This will be followed by a description and evaluation of the protocol positive body experience (PBE). Building on these analyses, new insights and ideas for the future will be presented in the general discussion.

### **Outline of the studies**

Chapter 2 describes a study in which the psychometric properties of the Dutch version of the BCS are evaluated in a female ED sample and a female community sample. The BCS is a 40-item questionnaire, which measures the degree of satisfaction with appearance and functionality of different parts of the body. Exploratory and Confirmatory Factor Analysis are used to examine its factor structure. The hypothesis that functional body satisfaction is a distinguishable factor in both samples is tested. Furthermore, differences in scores on body (dis)satisfaction as measured with the BCS between the women in the ED group and in a non-clinical sample are explored.

Chapter 3 describes a study in which the psychometric properties of the Dutch version of the FAS are evaluated in a female ED sample and a female community sample. The FAS is a 7-item questionnaire measuring body functionality appreciation. Besides factor analysis by means of Exploratory and Confirmatory Factor Analysis, internal consistency and test-retest reliability are examined. Convergent construct validity is established with the BCS and discriminant construct validity with the subscales restraint and eating concern of the Eating Disorder Examination Questionnaire (EDE-Q). Differences in body functionality between women with and without ED are explored.

Chapter 4 provides the development and description of a body-oriented treatment protocol with focus on positive body exposure. This chapter discusses the scientific basis of the protocol: positive body experience (PBE) and describes its content and structure, illustrated by clinical case vignettes. An important and innovative aspect of the protocol is that during body exposure the focus lies not only on aesthetic, but also on functional and tactile body experience.

Chapter 5 presents the results of a pilot study on the empirical results of the protocol PBE with regard to changes in body experience and eating pathology in women with eating disorders. We explore whether women with different EDs benefit differently from the protocol PBE. Also, we examine two possible mediators: the severity of the ED and the

severity of the depressive symptoms at the start.

The final chapter, 6, summarizes the main findings and reflects on the studies in this thesis in a general discussion. Clinical implications and suggestions for future research will be discussed.

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## Chapter 2

# Measuring body satisfaction in women with eating disorders and healthy women: Appearance-related and functional components in the Body Cathexis Scale (Dutch version)

Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity 2021: 1-8

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## ABSTRACT

**Purpose** Differentiating the concept of body satisfaction, especially the functional component, is important in clinical and research context. The aim of the present study is to contribute to further refinement of the concept by evaluating the psychometric properties of the Dutch version of the Body Cathexis Scale (BCS). Differences in body satisfaction between clinical and non-clinical respondents are also explored.

**Method** Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used to investigate whether functional body satisfaction can be distinguished as a separate factor, using data from 238 adult female patients from a clinical sample and 1060 women from two non-clinical samples in the Netherlands. Univariate tests were used to identify differences between non-clinical and clinical samples.

**Results** EFA identified Functionality as one of three factors, which was confirmed by CFA. CFA showed the best fit for a three-factor model, where Functionality, Non-weight, and Weight were identified as separate factors in both populations. Internal consistency was good and correlations between factors were low. Women in the non-clinical sample scored significantly higher on the BCS than women with eating disorders on all three subscales, with high effect sizes.

**Conclusions** The three factors of the BCS may be used as subscales, enabling researchers and practitioners to use one scale to measure different aspects of body satisfaction, including body functionality. Use of the BCS may help to achieve a more complete understanding of how people evaluate body satisfaction and contribute to further research on the effectiveness of interventions focussing on body functionality.

**Level of evidence** Level V, cross-sectional descriptive study

*Keywords:* Body image; Body satisfaction; Body appreciation; Eating disorder; Body functionality

## INTRODUCTION

The extensive interest in body satisfaction in the field of eating disorders entails an increasing need to differentiate and refine the concept of body satisfaction. Body satisfaction can be defined as satisfaction with appearance and/or functions of the body [1-2] and body dissatisfaction is found to be a serious risk factor for the development, persistence and relapse of eating disorders [3-5]. Therefore, there is a need to measure body satisfaction, both in general and in terms of distinct components, to compare pre and post treatment outcomes and contrast these with body satisfaction as expressed in other populations. While the main emphasis in the field of eating disorders has been on appearance-related body satisfaction, particularly weight-related body parts, until recently functional body satisfaction has received insufficient consideration. With this in mind, more insight into different components of body satisfaction is of importance.

The Body Cathexis Scale (BCS), was one of the first scales to assess body satisfaction [6]. It was developed by Secord and Jourard [7] who defined body-cathexis as the degree of satisfaction or dissatisfaction with the various parts or processes of the body. The BCS assesses not only satisfaction with various parts of the body (including non-weight related body parts, such as eyes and hair, and weight-related body parts, such as hips and legs) but also satisfaction with bodily functions, such as energy level and coordination. This appreciation of bodily functions has recently received greater consideration [8-9]. In the past the BCS has proved to be a valid and reliable questionnaire in various international psychometric studies [1-2, 10-14], resulting in a Dutch translation of the BCS [15] and a first psychometric evaluation of the Dutch version in a non-clinical student sample [16]. Nowadays the BCS is a widely used questionnaire in the Netherlands to assess body satisfaction in clinical practice, because the questionnaire is gender neutral and suitable to use in different mental disorders where body dissatisfaction may play a role, such as, next to eating disorders, somatic symptom disorders, body dysmorphic disorder, anxiety disorders, trauma-related disorders, and mood disorders [17]. However, the Dutch version of the BCS still lacks state-of-the-art psychometric evaluation, in particular exploratory and confirmatory factor analyses, in both clinical and representative non-clinical samples.

Following the example of the BCS, other questionnaires were developed to measure body satisfaction, such as the Body Esteem Scale (BES) [18], the Body Shape Questionnaire (BSQ) [19] and the Body Dissatisfaction Scale (BDS) [20]. In 2002 Thompson and Berg [21] stated that body satisfaction needed additional refinement using different components of body

satisfaction, such as weight satisfaction, shape satisfaction and satisfaction with specific body parts and features. In the field of eating disorders, this resulted in reduced attention to general body satisfaction and greater attention to satisfaction with weight and shape [22, 23].

In addition to differentiating various components of body satisfaction, over the past decade another development has been crucial in refining the concept of body satisfaction. Instead of a “pathology driven” approach, positive adaptive or healthy aspects of body satisfaction have received increasing emphasis [9, 24-26]. Frisé and Holmqvist [27] used a qualitative design to study positive body image attributes in Swedish adolescents and discovered that besides acceptance of the body, functional perception of the body is an important ingredient of body satisfaction. They concluded that encouraging mindsets evaluating the body more for function than appearance might help increase positive body satisfaction. Wood-Barcalow, Tylka and Augustus-Horvath [28] also identified a functional attitude towards one’s body as one of the attributes of a positive evaluation of the body. In the same line Halliwell [29] observed that functional aspects of body image may serve as a protective psychological mechanism against body dissatisfaction. In this context Wood-Barcalow et al. [28] stated that additional instruments measuring different positive attributes of body satisfaction are needed. Furthermore, Alleva et al. [9] emphasized the need for validated questionnaires measuring body functionality to drive and improve body satisfaction studies and introduced the seven-item unidimensional Functionality Appreciation Scale (FAS) [30]. However, it seems worthwhile to renew attention to the strength of the already available BCS, an instrument measuring both aesthetic and functional body satisfaction. For this reason, updated psychometric information, regarding the factor structure of the BCS may expand the value of the BCS in clinical practice, particularly with respect to eating disorders.

The first aim of the present study is to evaluate the psychometric properties of the Dutch version of the 40-item BCS [16], by re-examining the factor structure and investigate the hypothesis that functional body satisfaction is a distinguishable factor in all samples. The second aim is to explore differences in body (dis)satisfaction between clinical and non-clinical data. In line with earlier studies [2, 24, 31], it is hypothesized that the BCS will reveal a significantly lower body satisfaction, for the total scale and the subscales, in female patients with eating disorders compared to women in a non-clinical sample.

## **METHOD**

### **Participants**

Three independent samples were used in this study: one clinical sample and two non-clinical samples. The clinical sample consisted of 238 adult female patients with a variety of eating disorders. The patients were diagnosed according to DSM-IV criteria in the following categories: 86 (36.1 %) with anorexia nervosa (AN); 52 (21.8 %) with bulimia nervosa (BN) and 100 (42.0 %) with eating disorder not otherwise specified (EDNOS). According to the DSM-5 criteria, 22 participants (9.2 % of the total) diagnosed with EDNOS could have been diagnosed with binge eating disorder (BED). All patients attended an outpatient clinic specializing in the treatment of eating disorders in the Netherlands. The two non-clinical samples were recruited online and consisted of 579 (sample one) and 481 (sample two) adult women from the general Dutch population.

### **Procedure**

In the period from 2007 until 2019, patients in the clinical sample filled out the BCS as part of assessment before starting treatment. Data collection for the two non-clinical samples was conducted using a snowball sampling method through e-mails sent to potential participants in the network of students at the Department of Human Movement Sciences, Vrije Universiteit Amsterdam in 2016 (sample one) and the network of one student at the Master Youth Studies Utrecht University in 2019 (sample two). The e-mail included a link to the questionnaires, information about the study objective and the voluntary and anonymous participation, and a request to readers to forward the e-mail to others in their network. No participatory incentives were offered. Participants completed the questionnaire through a secure online system. All survey materials were removed from the internet upon completion of the data collection phase. This procedure was approved of the medical ethics review committee of the VU University Amsterdam (sample one) and the medical ethics review committee of the University Medical Centre Groningen (sample two). Informed consent was obtained from all individual participants included in this study, both clinical and non-clinical, authorizing anonymous use of their scores on the BCS for research purposes.

### **Measure**

The Body Cathexis Scale (BCS) [7] measures the degree of satisfaction with appearance and functionality of different parts of the body. The scale comprises 40 items, scored on a five-point Likert scale ranging from 1, “very dissatisfied”, to 5, “very satisfied”. Construct validity

and concurrent validity of the English 40-item BCS are good [10, 12, 14]. The original English version was translated into Dutch and psychometrically evaluated by Baardman and De Jong [15]. Dorhout et al. [16] further evaluated the Dutch 40-item version and found good reliability (Cronbach's alpha .91) and construct validity (Body Image Visual Analogue Scale:  $r = .68$  ( $p < 0.01$ ); Rosenberg Self Esteem Scale:  $r = .47$  ( $p < 0.01$ )).

### **Statistical analyses**

Exploratory Factor Analysis (EFA) was performed with the BCS data from non-clinical sample one and the clinical sample. Maximum likelihood with oblique rotation was used as the factor extraction method [32] according to SPSS 20.0. Numbers of factors retained were based on interpretation of the scree plot [33] and parallel analysis [34]. Interpretability of the factors [35] and theoretical considerations [36] were used to redefine factor structures. Cross-loadings were defined as an item that loads at  $> .32$  on two or more factors [35].

As is generally recommended [37-39] we used a second independent non-clinical sample for confirmatory analysis (CFA) using Mplus Version 8.0 [40] to evaluate the adequacy of the proposed factor structure following from EFA. Because each type of index provides different information about model fit [37], we chose to report a broad range of indices and included root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), Comparative Fit Index (CFI) and Tucker Lewis index (TLI). The RMSEA represents the fit of the estimated covariance matrix to the population's covariance matrix [41]. The RMSEA is regarded as one of the most informative fit indices thanks to its sensitivity to the number of estimated parameters in the model, which enables it to favour parsimonious models. As a rule of thumb, RMSEA values  $< .08$  suggest adequate and  $< .05$  good model fit [42]. The SRMR is the standardized square root of the difference between the residuals of the sample covariance matrix and the hypothesised covariance model. An SRMR between  $.05$  and  $.10$  indicates an acceptable fit and values  $< .05$  indicate good fit [43]. The CFI [44] compares the sample covariance matrix with a null model of uncorrelated latent variables. The CFI is one of the most commonly reported fit indices, as it is one of the measures least affected by sample size and is often reported together with the TLI, a comparative fit index slightly differing from the CFI in its approach to sample size and handling of the effect of model complexity [40]. CFI and TLI values in the range between  $.90$  and  $.95$  may be regarded as indicating good model fit [37].

Independent t-tests were used to analyse differences in scores between the non-clinical and the clinical sample. Cohen's  $d$  was used to establish effect sizes.

## RESULTS

No significant differences in age and BMI were found between the clinical sample ( $n = 238$ ) and non-clinical sample one ( $n = 579$ ). Mean age was 26.23 ( $SD 7.16$ , range 18-62) in the clinical sample and 27.45 ( $SD 12.25$ , range 18-66) in non-clinical sample one,  $t(721,801) = 1.767$ ,  $p = .078$ . Mean BMI was 21.91 ( $SD 4.82$ ) and 22.15 ( $SD 2.88$ ) respectively,  $t(307,482) = .698$ ,  $p = .486$ .

### Factor analyses

The Kaiser-Meyer-Olkin (KMO) scale verified the sampling adequacy for the first EFA on non-clinical sample one,  $KMO = .917$  (“good”, according to Field [45]); Barlett’s test of sphericity was statistically significant ( $\chi^2 = 8329$ ;  $df = 780$ ,  $p < .0001$ ), indicating that data were suitable for EFA. Parallel analysis [46] and inspection of the scree plot were employed to determine the appropriate number of factors to retain. The parallel analysis showed factor solutions with eigenvalues ranging from 1,237 to 1,589 for the first ten factors. This confirms the decision to retain the first three factors that could be distinguished in our data with all eigenvalues above this maximum. Also, the scree plot leaves no room for misinterpretation. The scree plot showed an inflection justifying retaining three factors. This three-factor solution accounted for 34.39 % of the variance.

In the EFA in the sample of women with eating disorders KMO was .859 (“good” according to Field [45]) and Barlett’s test of sphericity was statistically significant ( $\chi^2 = 3377$ ;  $df = 780$ ,  $p < .0001$ ). The scree plot showed an inflection justifying retaining three factors, accounting for 31.85 % of the variance.

In both EFA’s, the same three-factor solution offered the best fit (see Table 1). Factor 1 (twenty items: 38, 15, 13, 6, 40, 33, 30, 24, 21, 5, 14, 19, 2, 22, 23, 1, 4, 18, 36, 29) consisted of non-weight related items; factor 2 (seven items: 17, 16, 39, 10, 26, 28, 3) comprised weight-related items, and factor 3 (thirteen items: 7, 11, 9, 35, 31, 34, 27, 37, 20, 25, 32, 12, 8) referred to functionality. Item 12 “back” had low loadings on all factors; in the clinical as well as in non-clinical sample one. We decided to list item 12 under the factor functionality, since it loaded highest on this factor in the larger non-clinical sample. Item 8 “elimination” also loaded low on all factors, but highest on the factor functionality. Item 22 “arms” is the only item showing different results on the loadings: in the non-clinical sample the loading was highest on the factor non-weight whereas in the clinical sample the loading was highest on the factor weight. We decided to let the non-clinical findings be leading.



**Table 1**

Exploratory factor analyses: item loadings on the three factors in non-clinical sample one and the clinical sample

Sample	Factor	Non-clinical one ( <i>n</i> =579)			Clinical ( <i>n</i> =238)		
		1	2	3	1	2	3
BCS 38	Face	<b>.650</b>	-.192	.073	<b>.732</b>	-.086	.003
BCS 15	Chin	<b>.549</b>	-.103	.043	<b>.487</b>	-.245	-.001
BCS 13	Ears	<b>.543</b>	.062	-.011	<b>.575</b>	.139	-.057
BCS 6	Nose	<b>.518</b>	.058	.077	<b>.529</b>	.056	-.073
BCS 40	Sex organs	<b>.508</b>	-.148	-.047	<b>.391</b>	.086	-.107
BCS 33	Voice	<b>.508</b>	-.089	-.039	<b>.576</b>	-.017	.021
BCS 30	Overall appearance	<b>.507</b>	-.364	-.015	<b>.465</b>	-.457	-.048
BCS 24	Eyes	<b>.505</b>	.057	-.072	<b>.514</b>	-.038	.002
BCS 21	Shoulder Width	<b>.484</b>	-.077	-.046	<b>.313</b>	-.238	-.032
BCS 5	Body hair	<b>.484</b>	.022	.050	<b>.322</b>	.068	-.148
BCS 14	Age	<b>.480</b>	.046	.038	<b>.292</b>	-.015	-.199
BCS 19	Keeness of senses	<b>.450</b>	.180	-.095	<b>.293</b>	-.070	-.250
BCS 2	Facial complexion	<b>.416</b>	.070	-.076	<b>.500</b>	.055	-.029
BCS 22	Arms	<b>.412</b>	-.242	-.073	<b>.210</b>	.465	-.020
BCS 23	Breasts	<b>.408</b>	-.126	-.082	<b>.347</b>	-.106	.061
BCS 1	Hair	<b>.395</b>	-.040	-.028	<b>.420</b>	-.053	.056
BCS 4	Hands	<b>.375</b>	-.063	.022	<b>.270</b>	-.036	.003
BCS 18	Height	<b>.361</b>	-.150	-.002	<b>.323</b>	-.113	-.019
BCS 36	Knees	<b>.211</b>	-.112	-.157	<b>.315</b>	-.257	.030
BCS 29	Teeth	<b>.210</b>	-.078	.001	<b>.460</b>	-.076	-.050
BCS 17	Profile	.093	<b>-.861</b>	-.007	.039	<b>-.830</b>	-.042
BCS 16	Build	.095	<b>-.790</b>	-.012	.066	<b>-.759</b>	-.018
BCS 39	Weight	-.035	<b>-.737</b>	-.134	-.091	<b>-.729</b>	-.099
BCS 10	Waist	-.086	<b>-.631</b>	-.224	.100	<b>-.500</b>	-.063
BCS 26	Hips	.266	<b>-.542</b>	-.019	.215	<b>-.612</b>	.110
BCS 28	Legs	.252	<b>-.462</b>	-.079	.149	<b>-.546</b>	.041
BCS 3	Appetite	.183	<b>-.388</b>	-.148	.181	<b>-.449</b>	-.159
BCS 7	Physical stamina	-.167	-.062	<b>-.787</b>	-.117	<b>-.207</b>	<b>-.669</b>
BCS 11	Energy level	-.106	-.039	<b>-.738</b>	-.041	-.076	<b>-.658</b>
BCS 9	Muscle strength	-.167	-.124	<b>-.731</b>	.005	-.065	<b>-.654</b>
BCS 35	Physical skills	.059	-.038	<b>-.707</b>	.015	.011	<b>-.719</b>
BCS 31	Muscle tone	-.007	-.221	<b>-.579</b>	.143	-.229	<b>-.396</b>
BCS 34	Health	.223	.038	<b>-.541</b>	.027	.081	<b>-.547</b>
BCS 27	Resistance to illness	.201	.153	<b>-.428</b>	-.056	-.113	<b>-.401</b>
BCS 37	Flexibility	.168	-.112	<b>-.397</b>	.140	-.021	<b>-.452</b>
BCS 20	Pain tolerance	.274	.173	<b>-.365</b>	.028	.119	<b>-.503</b>

BCS 25	Coordination	.359	.059	<b>-.322</b>	.231	.083	<b>-.427</b>
BCS 32	Sleep	.140	-.060	<b>-.263</b>	.253	.117	<b>-.252</b>
BCS 12	Back	.234	-.040	<b>-.293</b>	.211	-.222	<b>-.210</b>
BCS 8	Elimination	.134	-.113	<b>-.235</b>	.100	-.117	<b>-.293</b>

CFA using non-clinical sample two provided the best fit for the three-factor model that resulted from the EFA (see Table 2). Fit could be improved by permitting correlated errors for items 31 “muscle tone” and 9 “muscle strength” (Modification Index 84.970) and for items 34 “health” and 27 “resistance to illness” (Modification Index 88.291).

**Table 2**

Confirmatory factor analysis of non-clinical sample two ( $n = 481$ )

Model	$\chi^2$	$df$	<i>RMSEA</i> (90 % <i>CI</i> )	<i>SRMR</i>	<i>CFI</i>	<i>TLI</i>
1 1 factor	3174	740	.083 (.080-.086)	.076	.625	.604
2 3 factors	2033	737	.060 (.057- .064)	.064	.800	.788
3 3 factors: 31 with 9; 34 with 27	1863	735	.057 (.053- .060)	.062	.826	.815

Note:  $\chi^2$  = chi square;  $df$  = degrees of freedom; *RMSEA* = root mean square error of approximation; 90 % *CI* = 90 % confidence interval of the *RMSEA*; *SRMR* = standardized root mean square residual; *CFI* = comparative fit index; *TLI* = Tucker Lewis index.

### Internal consistency and correlations

Cronbach’s alphas in non-clinical sample one and in the clinical sample were respectively .92 and .90 for the total scale, .84 and .85 for factor 1 (non-weight), .85 and .83 for factor 2 (functionality) and .86 and .83 for factor 3 (weight).

Correlations in non-clinical sample one between the different factors were .53 between non-weight and weight, .57 between non-weight and functionality, and .53 between weight and functionality. In the clinical sample correlations between the different factors were .49 between non-weight and weight, .55 between non-weight and functionality and .35 between weight and functionality.

### Differences between groups

Differences between the scores in the clinical sample and in non-clinical sample one were significant ( $p < .001$ ) for BCS total mean score as well as for the three subscales, meaning that in non-clinical sample one, women showed more satisfaction with their body than women in the clinical sample. The effect sizes were high, with the subscale Weight showing the highest effect size (see Table 3).

**Table 3**

Means ( $M$ ) and standard deviations ( $SD$ ) of scores on the Body Cathexis Scale and factors in the clinical sample of females with eating disorders and of in non-clinical sample one, test of the difference and effect size (Cohen's  $d$ )

	Eating Disorders ( $n=238$ )	Non-clinical one ( $n=579$ )		
(sub) scale	$M$ ( $SD$ )	$M$ ( $SD$ )	$t$ (728)	Cohen's $d$
BCS total mean score	2.88 (0.49)	3.58 (0.49)	18.75*	1.43
Non-weight	3.10 (0.53)	3.67 (0.49)	14.64*	1.12
Weight	2.03 (0.73)	3.41 (0.79)	23.03*	1.81
Functionality	3.01 (0.61)	3.56 (0.60)	11.72*	0.91

\*  $p < .001$

### DISCUSSION

This study had two principal aims. The first aim was to investigate the hypothesis that functional body satisfaction is a distinctive factor in the BCS, in both non-clinical and clinical samples. EFA did indeed identify Functionality as one of the three factors, and this was confirmed by CFA. More specifically, the CFA results revealed adequate fit values for the three-factor model with a Functionality, a Non-weight and a Weight factor. These three factors may be used as subscales, given their good internal consistency and the relatively low correlations between the factors. The high alpha for the total scale is in concordance with earlier research [1, 11, 14, 16].

Interestingly, in the clinical sample the correlations between the factors are lower than in the non-clinical sample, especially between the factors Functionality and Weight. An explanation for these results might be that patients with eating disorders, due to their negative body image, focus to a high degree on a limited area of body satisfaction, while subjects with a more positive body image may be expected to have a broader and more integrated perception of body appreciation. In the same vein Tylka and Wood-Barcalow [47] concluded that a positive body satisfaction is not limited to one dimension of body appreciation. They regard positive body image as a holistic construct. It might be possible that patients with eating disorders have lost an integrated and holistic view of their body and that it is important to re-establish this view in therapy.

Having the option of using three distinct subscales may enhance research, assessment and treatment of different components of body satisfaction [28, 48-49], in particular body functionality [8-9, 50]. Abbott and Barber [8] observed that women do not automatically mention their body's functionality when asked to reflect on or evaluate their bodies and they also found that when functionality is incorporated into the measurement of body image, the functionality of the body is valued more highly than appearance by both male and female adolescents. These findings highlight even more the importance of measuring the functional dimension of body satisfaction. Already in 2011 Cash and Smolak [51] mentioned the lack of research on body functionality. The present study provides evidence that the BCS fills this gap and does incorporate a body functionality subscale. Therefore, the BCS could be a valuable instrument for assessing functional body satisfaction and thus help to achieve a more complete and holistic understanding of how people evaluate their body. Given the fact that Alleva et al. [30] recently developed the FAS to specifically measure body functionality, it would be relevant to investigate in both clinical and non-clinical samples to what extent the subscale Functionality of the BCS and the FAS measure the same construct.

The second aim of this study was to explore differences in body satisfaction between the clinical and the non-clinical samples. As predicted, women in the non-clinical sample reported significantly greater satisfaction with their bodies than those in the clinical sample, as reflected by differences on total scores and subscale scores with high effect sizes. The subscale Weight showed the highest effect size ( $d = 1.81$ ). This result is not surprising, since dissatisfaction and obsession with weight-related body characteristics and body parts is a key issue in patients with eating disorders [52]. The effect sizes for the subscales Functionality ( $d = 0.91$ ) and Non-weight ( $d = 1.12$ ), though still high, were lower than for the subscale Weight. Functional body satisfaction reflected the least relative difference. The results suggest that it

might be worthwhile to investigate whether enhancing functional satisfaction, as suggested by Frisé and Holmqvist [27], could lead to a generally more positive body image in female patients with eating disorders. However, functional body image is often not discussed in treatment, because aesthetic body image is generally the main problem presented by patients. When professionals and patients become more conscious of body functionality, by using questionnaires assessing body functionality like the BCS, this may also provide a basis for therapeutic interventions to mitigate body dissatisfaction by focusing on body functionality. Within this context, Webb et al. [49] state that recognizing and appreciating the various functions that the body performs can be a valuable resource for enhancing positive body image. In line with this statement, Alleva, Veldhuis and Martijn [53] recently found that focusing on body functionality was effective in protecting and promoting a positive body image in female students.

The present study has several limitations. First of all, emphasis was put on factor-analytical approaches because we wanted to investigate the hypothesis that functional body satisfaction is a distinguishable factor in the clinical and the non-clinical samples. Establishing test-retest reliability and construct validity, especially in clinical populations, needs to follow, now this hypothesis has been confirmed. We also could not evaluate whether the BCS items are invariant across the non-clinical and clinical groups, because the size of the clinical sample was too small for multiple group CFA. Another limitation concerns the composition of the samples used. Since the average age of the female participants in all samples was mid-twenties, it limits the generalizability of these findings to other samples. Additional research with male and older participants is desirable.

## **Conclusion**

The BCS has long been used as a general measure for body satisfaction. Other measurements were developed after the BCS with a focus predominantly on weight and shape. In the past decade, awareness has increased that other components of body satisfaction, such as functional body satisfaction, should be measured as well. This led to new scales to assess body functionality but also to a renewed interest in the BCS which was assumed to be a reliable and valid instrument that also incorporates body functionality. In this study of the Dutch version of the BCS this was confirmed with three factors identified: Non-weight, Weight, and Functionality. These three factors may be used as subscales, enabling mental health professionals and researchers to use one scale to measure different aspects of body

satisfaction, including body functionality. These results may stimulate new perspectives on body image therapy and enhance our understanding of how body satisfaction in female patients with eating disorders differs from healthy women.

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## Chapter 3

# The Functionality Appreciation Scale (FAS): psychometric properties and results of the Dutch version in a community sample and a sample of women with eating disorders

Under review

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## **ABSTRACT**

### **Background**

Body satisfaction in people with eating disorders (EDs) is negatively affected by their critical evaluation of aesthetic aspects. A focus on body functionality could create a more positive perspective. This study examines psychometric properties of the Dutch version of the Functionality Appreciation Scale (FAS) and differences in scores between women with and without EDs.

### **Method**

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used to investigate the factor structure in data from a community sample of 669 women and an ED sample of 150 women. Reliability, test-retest scores and correlations with Body Cathexis Scale (BCS) and Eating Disorder Examination Questionnaire (EDE-Q) were investigated. T-tests were used to evaluate differences between samples.

### **Results**

EFA identified a one-dimensional factor structure, which was confirmed by CFA. Reliability was adequate and convergent and discriminant validity were supported through correlations with BCS and EDE-Q (subscale) scores. FAS-scores were significantly lower for women with EDs compared to women from a community sample.

### **Conclusions**

Psychometric results of the Dutch version of the FAS are promising and validate its use for clinical and research purposes. The significant difference between FAS scores in the female ED sample and the female community sample indicates that female ED patients obviously have a lower body satisfaction concerning body functionality compared with healthy women. Further research with male ED participants as well as exploration of sensitivity to change are recommended.

### **Keywords**

Body functionality; Body satisfaction; Body image; Eating disorders; Psychometrics; FAS

## BACKGROUND

Body dissatisfaction is recognized as a robust risk factor for the development, maintenance and relapse of eating disorders (EDs) [1–3]. In people with EDs, body dissatisfaction predominantly focuses on negatively experienced aesthetic aspects of the body. However, body satisfaction is not restricted to the way the body “looks”, but may also concern the way the body “functions” [4]. Thus, the body has aesthetic qualities as well as functional qualities which, according to Abbott and Barber [5], concern perceptions of how the body feels, moves and functions. Both aesthetic and functional appreciation play a role in the level of body satisfaction.

Alleva et al. [6] introduced the term body functionality for the functional aspects of body image. They describe body functionality as everything that the body does or is capable of doing and argue that it encompasses functions related to physical capacities, health and internal processes, bodily senses and perceptions, creative endeavours, communication with others and self-care. Body functionality appreciation could serve as an important aspect of body satisfaction and may be a useful target in the treatment of body dissatisfaction in EDs [6–8]. In their review on body functionality, Alleva and Tylka [9] concluded that research underscores body functionality as a valuable construct with respect to body satisfaction and disordered eating. The authors state that appreciating body functionality rather than (only) physical appearance may not only lead to more body satisfaction, but also to the ability to be more attuned to the body. For example, to be able to have an eating pattern based on listening and following body cues such as hunger and satiety, instead of disordered eating cognitions. In this context, Baceviciene and Jankauskiene [10], found that viewing the body from a functional perception was a strong predictor of less disordered eating behaviour.

Research in non-clinical groups, for example the study by Frisé and Holmqvist [11], showed that when the evaluation of the body is more orientated towards function than appearance, it might help to increase positive body image. Also, Wood-Barcalow et al. [12] concluded, based on a qualitative study among female university students in the United States, that in women with a positive body image, a functional perception of the body is part of their body identity. Furthermore, in a sample of female psychology students in the United Kingdom, Halliwell [13] observed that functional aspects of body satisfaction may serve as a protective psychological mechanism against body dissatisfaction, contrary to aesthetic aspects. The above mentioned non-clinical studies show that a positive functional perception of the body or body parts may serve as an important ingredient of body satisfaction. However,

little is known about the role of body functionality in the field of EDs.

Enhancing awareness of professionals and ED patients by measuring body functionality in a clinical context, may lead to more diagnostic knowledge and to more insight into the course and effect of the treatment of body dissatisfaction. Abbott and Barber [4] considered the fact that most body image questionnaires fail to incorporate the functional dimension as a considerable limitation. They found that especially women do not evaluate or reflect spontaneously on functional aspects of their body. A questionnaire which incorporates body functionality may clarify and sensitize these aspects during a diagnostic phase. Furthermore, measuring body functionality creates the possibility to monitor the effectiveness of therapeutic interventions which focus on functional aspects of body image to enhance body satisfaction. In this light, Rekkers et al. [7,14] developed and evaluated a protocol based on *positive* body exposure in which body functionality forms an important and innovative part. Recently, Walker and Murray [8] developed a novel body functionality-focused mirror exposure, integrating a complete focus on body functionality with mirror exposure.

In order to gain a better understanding of the efficacy of these interventions, questionnaires are needed to evaluate the role and influence of body functionality as a separate dimension of body image. In the last decades two questionnaires have been presented, which measure body functionality besides aesthetic body image. In 2010, Abbott and Barber [4] developed the Embodied Image Scale (EIS), which measures the cognitive, behavioural and affective components of body image across the functional and aesthetic dimensions of the body. In a sample of Australian adolescents, the EIS demonstrated acceptable validity and reliability. Recently, Rekkers et al. [15] described functional body satisfaction as a separate factor in the Body Cathexis Scale (BCS) [16] in both a non-clinical sample and a clinical ED sample. The BCS measures the degree of satisfaction with both appearance and functionality of different parts of the body and has been proven a valid and reliable questionnaire in various studies [17–20]. Although, these two questionnaires are available, a questionnaire assessing the construct of body functionality separately was missing. For this reason, Alleva et al. [21] developed the Functionality Appreciation Scale (FAS).

The FAS is a 7-item questionnaire measuring body functionality appreciation. Alleva and colleagues [21] examined its psychometric properties among three online adult community samples of women and men in the U.S. They found that FAS-scores demonstrated criterion-related and construct validity and were internally consistent and stable across a three-week period. Exploratory and confirmatory factor analysis revealed a unidimensional

structure. Shortly thereafter, more psychometric studies on the FAS were conducted in Malaysia [22], Australia [23], Brazil [24], Italy [25], Romania [26], Japan [27] and Lebanon [28]. However, despite this considerable number of studies, the FAS has not been examined in a Dutch community sample, let alone in a clinical ED sample. It is unclear to what extent the instrument's psychometric properties will be upheld in a sample consisting of patients with EDs. Furthermore, it is relevant to explore to what extent FAS-scores show differences between non-clinical and clinical samples.

To expand the existing knowledge on the FAS, the first goal of the present study is to evaluate the psychometric properties of the FAS in a Dutch community sample and a clinical ED sample, examining factor structure, construct validity and reliability. We expect, based on prior research, that the Dutch translation of the FAS [29] will demonstrate a one-dimensional factor structure in both exploratory and confirmatory factor analyses. Evidence of convergent construct validity will be established through positive associations with body satisfaction, measured with the Body Cathexis Scale (BCS) [15], especially with the subscale Functionality of the BCS. Furthermore, we will examine discriminant construct validity. Taking in consideration the finding by Baceviciene and Jankauskiene [10] that body functionality was a strong predictor of less disordered eating behaviour, we hypothesize that FAS scores will correlate negatively with the subscales restraint and eating concern of the Eating Disorder Examination Questionnaire (EDE-Q) [30]. Finally, we will assess test-retest reliability of FAS scores over a 2-week retest interval.

The second goal is to explore differences in body functionality measured with the FAS between the community sample and the ED sample. In line with the study by Rekkers et al. [15] in which data on the functionality scale of the BCS was used, it is hypothesized that the FAS will reveal a significantly lower functional body satisfaction in people with EDs compared to respondents from a community sample.

## **METHOD**

### **Participants**

Two independent samples were used in this study. The ED sample was recruited in thirteen specialized centres for ED across the Netherlands between February 2021 and November 2021 and consisted of 156 participants with EDs. Inclusion criteria for participation were currently in treatment in one of the centres and age older than 18. Only a very small minority



of participants were male (women  $n = 150$ , men  $n = 5$ , unknown  $n = 1$ ). For this reason, we limited our ED sample to women in order to create a gender homogeneous sample. The 150 women were diagnosed according to DSM-5 criteria in the following categories: Anorexia Nervosa (AN) 62.7% ( $n = 94$ ), Bulimia Nervosa (BN) 9.3% ( $n = 14$ ), Binge Eating Disorder (BED) 13.2% ( $n = 20$ ), Otherwise Specified Feeding and Eating Disorder (OSFED) 14% ( $n = 21$ ) and Avoidance Restrictive Food Intake Disorder (ARFID) 0.7% ( $n = 1$ ). Mean age was 29.45 ( $SD = 10.44$ , range 18-67) and self-reported mean body mass index (BMI) was 22.13 ( $SD = 7.62$ , range 12.70-48.65). Ninety-five women followed an outpatient ED treatment and 55 an inpatient ED treatment, with an average treatment duration of 8.9 months ( $SD = 11.51$ , range 1-96).

The community sample consisted of 982 individuals from the general Dutch population, recruited between November 2019 and May 2020. The inclusion criteria were age older than 18 years and absence of ED symptoms, according to scores of the EDE-Q. Following these inclusion criteria, we excluded participants younger than 18 ( $n = 17$ ) from the original sample and also removed participants with an EDE-Q score more than two standard deviations above the mean ( $n = 40$ ). We did not exclude participants with a very high or very low BMI, when their EDE-Q scores gave no indication for ED symptoms. The sample of the remaining 925 participants consisted of 669 women and 256 men with an average age of 36 years ( $M = 36.53$ ,  $SD = 14.71$ , range 18-76) and an average self-reported BMI of 23.97 ( $SD = 3.64$ , range 13.93- 41.10). To be able to compare the community sample and the ED sample we excluded the men in the community sample in our psychometric analyses and used a sample of female participants with an average age of 36.03 ( $SD = 14.10$ , range 18-76) and an average self-reported BMI of 23.71 ( $SD = 3.83$ , range 13.93- 41.10).

## Measures

The FAS [21]; Dutch version: Alleva and Martijn [29] contains seven items rated on a 5-point Likert scale (1 = 'strongly disagree' to 5 = 'strongly agree'). Scores from all items are averaged to produce a total score, with higher scores reflecting greater functionality appreciation. Internal consistency was good with Cronbach's alpha .89 for the total sample (.88 women, .90 men) and a test-retest reliability (ICC) of .81 for women and .74 for men [21].

The BCS [16]; Dutch version: Dorhout, Basten, Bosscher and Scheffers [31] measures the degree of satisfaction with appearance and functionality of different parts of the

body. The BCS consists of 40 items rated on a 5-point Likert scale (1 = 'very dissatisfied' to 5 = 'very satisfied'). Higher scores indicate a higher body satisfaction. The construct and concurrent validity of the original scale are good [18,32] Research on the Dutch version of the BCS in both an ED ( $n = 238$ ) and a community ( $n = 1060$ ) sample revealed three subscales: functional body satisfaction, weight related body satisfaction and non-weight related body satisfaction [15]). Internal consistency was good in both samples with Cronbach's  $\alpha = .90$  for the total scale and Cronbach's  $\alpha = .83 - .85$  for the subscales in the clinical sample [15].

The EDE-Q [30]; Dutch version: Aardoom, Dingemans, Slof Op 't Landt and Van Furth [33] measures ED symptoms. The EDE-Q consists of 36 items of which 22 determine the total score. These 22 items comprise four subscales, assessing restraint, shape concerns, weight concerns and eating concerns over the previous 28 days. Items are answered on a 7-point Likert scale ranging from 0, 'not one day', to 6, 'every day'. Higher scores are indicative of higher ED psychopathology. Internal consistency of the Dutch version is good, with Cronbach's  $\alpha = .95$  for the total scale and varying from .81 to .91 for the subscales [33].

## **Procedure**

The study protocol was approved by the ethics committee of the Faculty of Social and Behavioural Sciences of Utrecht University (number 20-383). Furthermore, the Medical Ethics Review Committee of Utrecht University was consulted on this procedure; reference number WAG/mb/20/022653.

To collect clinical data the project was advertised in the thirteen centres for ED as a study on "Measuring exercise behaviour and body image in people with EDs", by means of a poster and accompanying flyers including a QR-code. To participate in the study, ED patients could scan the QR-code on the flyer. After providing digital informed consent, information about the study objective and the voluntary and anonymous participation, participants were asked to complete an online survey via Qualtrics ([www.qualtrics.com](http://www.qualtrics.com)).

Data collection for the community sample was conducted using a snowball sampling method through e-mails sent to potential participants in the network of six bachelor students from Windesheim University of Applied Sciences, School of Human Movement and Education and the network of the first two researchers of this study. The e-mail included a link to the questionnaires preceded by an informed consent, information about the study objective and the voluntary and anonymous participation, and a request to readers to forward the e-mail to others in their network. Participants completed the survey through a secure online system (Formdesk) and could indicate if they were willing to fill out the survey for a

second time. If this was the case, they got a personal code and received the survey again after two weeks. Hundred sixteen female participants completed the survey twice within a three-week interval. All survey materials were removed from the internet upon completion of the data collection phase.

Informed consent was obtained from all individual participants included in this study, both clinical and non-clinical. In both samples no participatory incentives were offered.

### **Statistical analysis**

The factor structure of the Dutch FAS was examined using a two-step process that involved exploratory factor analysis (EFA) in the first step and confirmatory factor analysis (CFA) in the second step [34]. The all-female ED sample was split, using a computer-generated random seed, and the same procedure was followed for the female participants of community sample. For the EFA this resulted in a split-half female ED sample ( $n = 75$ ), and a split-half community sample of women ( $n = 331$ ). For the CFA the following split-half samples were used: a female ED sample ( $n = 75$ ) and a female community sample ( $n = 338$ ). For the EFA, maximum likelihood was used as the factor extraction method [35] using SPSS 28.0. Numbers of factors retained were based on interpretation of the scree plot [36] and parallel analysis [37]. Cross-loadings were defined as an item that loads at  $> .32$  on two or more factors [38]. For the CFA, we chose to report a broad range of indices and included root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), Comparative Fit Index (CFI) and Tucker Lewis Index (TLI). As a rule of thumb, RMSEA values  $< .08$  suggest adequate and  $< .05$  good model fit [39]. An SRMR between  $.05$  and  $.10$  indicates an acceptable fit and values  $< .05$  indicate good fit [40]. CFI and TLI values in the range between  $.90$  and  $.95$  may be regarded as indicating good model fit [41].

To examine construct validity, correlations between functional appreciation, body satisfaction and ED pathology were analysed using Pearson product-moment correlation coefficient with correlations considered strong if  $r = .50$  to  $1.0$ , moderate if  $r = .29 - .49$  and weak if  $r = .10$  to  $.29$  [42]. To assess the internal consistency for the FAS items, we calculated Cronbach's alpha and, for completeness, also McDonald's  $\omega$  using the so-called HA algorithm that estimates item loadings based on products, ratios, and sums of the covariances of item responses. This algorithm, integrated in the OMEGA Macro by Hayes, also provides for confidence intervals for  $\omega$  [43]. Whereas Cronbach's alpha assumes equal factor,  $\omega$  can be used as an estimator of reliability when this condition is not met. McDonald's  $\omega$  values above  $.70$  are considered adequate [44]. Test-retest reliability of the FAS scores was established by

intraclass correlation (ICC; two-way mixed model, absolute agreement, single measurement) [45],  $ICC \geq .75$  was considered excellent, between  $.60$  and  $.74$  good, between  $.40$  and  $.59$  fair and below  $.40$  poor [46].

An independent t-test was used to analyze possible differences in FAS scores between men and women in the community sample, a comparison made under the assumption of gender invariance that was found earlier in Western community samples [21,25,26,47]. Differences in FAS mean scores of the female community and female ED sample were also explored with an independent t-test.

## RESULTS

### Preliminary analyses

In the community sample, no significant difference between FAS-scores of men and women was found ( $t(923) = -0.555$ ;  $p = .479$ ). FAS-scores of women in the community and the ED sample differed significantly ( $t(817) = 17.103$ ;  $p = .0001$ ). For means and *SD* of all questionnaires of both samples see Table 1.

**Table 1.** Means and *SD* of all questionnaires in the community sample (total, men and women) and in the female ED sample.

Measures	Non-clinical	Non-clinical	Non-clinical	Clinical
	Total ( $n = 925$ )	Men ( $n = 256$ )	Women ( $n = 669$ )	Women ( $n = 150$ )
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )
FAS	4.24 (0.57)	4.24 (0.57)	4.26 (0.57)	3.29 (0.85)
BCS Total	3.62 (0.52)	3.77 (0.51)	3.57 (0.51)	2.73 (0.52)
-BCS-NW	3.71 (0.54)	3.81 (0.55)	3.68 (0.53)	2.94 (0.53)
-BCS-W	3.44 (0.78)	3.73 (0.64)	3.33 (0.79)	1.90 (0.76)
-BCS-F	3.57 (0.60)	3.72 (0.57)	3.52 (0.61)	2.85 (0.61)
EDE-Q Total †	1.07 (0.87)	0.86 (0.76)	1.15 (0.90)	3.78 (1.11)
-EDE-Q-R	1.10 (1.10)	1.08 (1.14)	1.12 (1.08)	3.38 (1.41)
-EDE-Q-EC	0.43 (0.66)	0.36 (1.14)	0.45 (1.08)	2.92 (1.13)
-EDE-Q-WC	1.33 (1.16)	0.96 (0.94)	1.48 (1.20)	4.16 (1.29)
-EDE-Q-SC	1.42 (1.19)	1.05 (0.95)	1.57 (1.24)	4.65 (1.17)

*Note:* *M* = mean, *SD* = standard deviation, FAS = Functionality Appreciation Scale, BCS = Body Cathexis Scale, BCS-NW = Body Cathexis Scale-Non-Weight, BCS-W = Body Cathexis Scale-Weight, BCS-F = Body Cathexis Scale-Functionality,

EDE-Q = Eating Disorder Examination Questionnaire, EDE-Q-R = Eating Disorder Examination Questionnaire-Restraint, EDE-Q-EC = Eating Disorder Examination Questionnaire-Eating Concern, EDE-Q-WC = Eating Disorder Examination Questionnaire Weight Concern, EDE-Q-SC: Eating Disorder Examination Questionnaire Shape Concern, † For EDE-Q results female ED sample:  $n = 142$

### Exploratory factor analysis

The Kaiser-Meyer-Olkin (KMO) scale verified the sampling adequacy for the EFA on the female community sample, with KMO = .887 (“good”, according to Field, [48]); Barlett’s test of sphericity was statistically significant ( $\chi^2 = 1039.25$ ;  $df = 21$ ,  $p < .0001$ ), indicating that data were suitable for exploratory factor analysis. Inspection of the scree plot was employed to determine the appropriate number of factors to retain. The scree plot showed an inflection justifying one factor. Also, parallel analysis [49] suggested that the seven FAS items converged into one factor, accounting for 58.34% of common variance (see Table 2).

In the EFA on the female ED sample KMO was .897 (“good” according to Field, [48]) and Barlett’s test of sphericity was statistically significant ( $\chi^2 = 336.92$ ;  $df = 21$ ,  $p < .0001$ ). Both the scree plot and parallel analysis justified one factor, accounting for 67.18% of the total item variance (see Table 2).

**Table 2.** Items of the Functionality Appreciation Scale in English and Dutch (in Italics) and factor loadings derived from exploratory factor analysis with the female community sample and the female ED sample.

Item	Community sample ( $n = 331$ )	ED sample ( $n = 75$ )
1 I appreciate my body for what it is capable of doing / <i>Ik waardeer mijn lichaam voor wat het in staat is om te doen</i>	.738	.804
2 I am grateful for the health of my body, even if it isn’t always as healthy as I would like it to be / <i>Ik ben dankbaar voor de gezondheid van mijn lichaam, zelfs als het niet altijd zo gezond is als ik graag zou willen</i>	.731	.799
3 I appreciate that my body allows me to communicate and interact with others / <i>Ik waardeer dat mijn lichaam me de mogelijkheid geeft om te communiceren en in contact te zijn met anderen</i>	.657	.777
4 I acknowledge and appreciate when my body feels good and/or relaxed/ <i>Ik erken en waardeer het wanneer mijn lichaam goed en/of relaxt voelt</i>	.605	.627
5 I am grateful that my body enables me to engage in activities that I enjoy or find important/ <i>Ik ben dankbaar dat mijn lichaam me in staat stelt om deel te nemen aan activiteiten die ik leuk of belangrijk vind</i>	.780	.866

6	I feel that my body does so much for me/ <i>Ik vind dat mijn lichaam heel veel voor mij doet</i>	.736	.799
7	I respect my body for the functions it performs / <i>Ik respecteer mijn lichaam voor de functies die het uitvoert</i>	.763	.817

### Confirmatory factor analysis

CFA showed a good fit for the one-factor model that resulted from the EFA (see Table 3).

**Table 3.** CFA of the female community sample (n = 338) and the female ED sample (n = 75)

Factor	Sample	$\chi^2$	df	RMSEA (90 % CI)	SRMR	CFI	TLI
1	ED	220.070	21	.000 (.000 - .094)	.037	1.000	1.018
1	Community	1172.472	21	.112 (.088 - .138)	.040	.948	.922

Note:  $\chi^2$  = chi square; *df* = degrees of freedom; *RMSEA* = root mean square error of approximation 90% CI = 90% confidence interval of the RMSEA; *SRMR* = standardized root mean square residual; *CFI* = comparative fit index; *TLI* = Tucker Lewis index

### Reliability

Cronbach's alpha's for the FAS in the female community sample and female ED sample were .88 and .90 respectively. McDonald's  $\omega$  was equal to these alpha's, that is .88 (95% CI = .86 to .90) in the community sample and .90 for the ED sample (95% CI = .86 to .92). The intraclass correlation coefficient (ICC) between test and retest FAS-scores in the female community sample was .70.

### Convergent and discriminant construct validity

Pearson's correlations between the FAS and the BCS total score and subscales were positively correlated in the female community sample and the female ED sample, with correlations varying from moderate to strong (see Table 4). In the female ED sample correlations between FAS scores and the subscale eating restraint of the EDE-Q were weak and negatively correlated ( $r = -.263, p < 0.01$ ). Correlations between FAS scores and the subscale eating concern of the EDE-Q were moderate and negatively correlated ( $r = -.374, p < 0.01$ ).

**Table 4.** Pearson correlations between the FAS and BCS in the the female ED sample and the female community sample

<b>ED sample (n = 150)</b>	<b>BCS Total</b>	<b>BCS-NW</b>	<b>BCS-W</b>	<b>BCS-F</b>
FAS	.589 **	.556 **	.475 **	.476 **
<b>Community sample (n = 669)</b>	<b>BCS Total</b>	<b>BCS-NW</b>	<b>BCS-W</b>	<b>BCS-F</b>
FAS	.510 **	.420 **	.400 **	.468 **

*Note:* FAS = Functionality Appreciation Scale, BCS = Body Cathexis Scale, BCS-NW = Body Cathexis Scale-Non-Weight, BCS-W = Body Cathexis Scale-Weight, BCS-F = Body Cathexis Scale-Functionality, \*\*  $p < 0.01$ .

## DISCUSSION

In this study we examined the psychometric properties of the FAS in a female community sample and a female ED sample. We also explored differences in body functionality measured with the FAS between these two samples and between men and women in the community sample. In terms of the dimensionality of FAS scores, EFA identified a one-dimensional factor structure, which was confirmed by CFA, revealing excellent fit values for a one-factor model in both the female community sample and the female ED sample. These results are in line with previous studies on the FAS in community samples [21-28,47]. Internal consistency was high in both samples with equal Cronbach's alpha's and McDonald's  $\omega$ 's which suggests essential tau-equivalence for all seven items. Test-retest reliability in the female community sample was good.

Strong positive correlations were found between the FAS and the total BCS-scores in the female community sample and the female ED sample, supporting the convergent validity of the Dutch FAS in these two samples. Contrary to our expectations, the subscale Functionality of the BCS did not have a stronger positive correlation with the FAS scores than the two other subscales of the BCS in these samples. The explanation could be that the FAS and the subscale Functionality of the BCS do not entirely measure the same construct of body functionality. Alleva et al. [21, p.29] define functionality appreciation as "appreciating, respecting, and honouring the body for what it is capable of doing". This points at the fact that FAS-items measure not only appreciation, but also respect and gratitude for body functionality. In addition, all these items refer to the functioning of the body as a whole. In contrast to FAS-items, the items of the BCS subscale Body functionality only ask for the level

of satisfaction as an indicator for functionality appreciation and these items refer to specific body parts or body processes.

An important but as yet overlooked point is the effect of the interpretation of the term body. Clinical observations show that, when ED patients speak or think about their body, they only tend to make connection with the middle part of their body, the part they often disgust and objectify. Thus, for ED patients, using the term body in the FAS-items could unintentionally stimulate negative thoughts and feelings and/or cause confusion about what is meant by the term 'body'. When somebody with an ED is asked if she respects her body or is grateful for what her body can do and she only visualizes her torso as an equivalent of her body, the answers will most likely be negative. It would, therefore, be interesting to consider if asking for the level of satisfaction with the functioning of specific body parts or body processes, as requested in the BCS, could encourage perception and awareness that one's own body is more than a disliked torso. We recommend to use both the BCS and the FAS in the field of EDs in order to get a more complete and more accurate picture of body functionality.

As hypothesized, FAS scores in the female ED sample were negatively correlated with the subscales eating restraint and eating concern of the EDE-Q. These outcomes differ from those in the study by Alleva et al. [21] in a U.S. online community sample of women and men, where no correlations between disordered eating and FAS scores were found. The negative correlations in our female ED sample indicate that lower scores of body functionality are associated with higher scores of disordered eating behaviour. This finding has important clinical relevance, because it suggests that functionality appreciation may not only protect against body dissatisfaction, but also against symptoms of disordered eating behaviour. According to Linardon et al. [50] it may even promote adaptive eating patterns.

Consistent with the findings by Alleva et al. [21], Anastasia et al. [47], Cerea et al. [25], and Swami et al. [26] we found no significant sex difference in FAS scores in the community sample. Importantly, there was a significant difference between FAS scores in the female ED sample and the female community sample. This suggests that female ED patients are less satisfied with how their body functions than women of a community sample and that the FAS is able to accurately measure this difference. This is important when considering the clinical application of the FAS in the field of EDs, both for diagnostic use and to evaluate the effectiveness of interventions focussing on body functionality. However, the assumption of invariance between the clinical and non-clinical group was not tested. Therefore, this comparison between the two groups should be interpreted with caution. More in general, these considerations also apply to the results of the CFA on the ED sample. Since this was the



first study that incorporated such a sample, no accurate estimates of factor loadings were available beforehand thus restricting a specific post-hoc power analyses. In line with other studies [25-27] who based their power calculations on results of the community sample from Aleva et al. [21] and strive for a minimum of 180 participants, we need to stress that our sample of 75 lacks adequate power for the CFA analyses.

The present study has several other limitations. Although some insight is gained on test-retest stability, the design of the study did not make it possible to examine sensitivity to change of the FAS. Given that therapeutic interventions have been developed in the field of EDs, which also focus on [7,51] or entirely address [8] functional aspects of body image to enhance body satisfaction, it is essential to be able to measure body functionality appreciation before, during and after these interventions. For this reason, we recommend, along with Yurtsever et al. [52], further research exploring the sensitivity to change of the FAS.

Another limitation in our study was the disproportionate distribution of the various types of EDs in our clinical sample. The majority of them were women with AN (62.7%) and the percentages of women with BN (9.3%) and ARFID (0.7%) were low. It would be interesting for future research in clinical samples in which the various types of EDs are more evenly distributed, to find out if there are meaningful differences in the appreciation of body functionality between these types.

A point to consider is that mean FAS scores were high and in the community sample even much higher than the scale mid-point (men:  $M = 4.26$ ; women:  $M = 4.24$ ), suggesting, as also argued by Swami et al. [22], a ceiling effect. This makes discrimination among subjects among the top of the scale difficult and can result in measurement inaccuracy. Swami et al. [22] explain these high means by stating that it may be difficult for individuals to disagree with FAS items, because they are formulated to be generally applicable. Another observation in the present study, which could also create a ceiling effect, is that FAS-items do not seem sufficiently distinctive from each other, with closely spaced item loadings between .605 and .780 (community sample) and .627 and .866 (ED sample). The ceiling effect possibly also accounts for the near perfect model fit found in the CFA using sample of women with ED with CFI and TLI  $> 1.0$  and RMSEA = .00. One could argue that this is an indication of over fitting but in this case, we need to stress that new data were used.

A final limitation concerns the low number of male respondents in the original ED sample. In this study the community sample ( $n = 925$ ) consisted of an acceptable balanced mix of adult men and women of different ages, without eating disorder symptoms, which gives indications of community norm scores for women as well as for men of the Dutch

version of the FAS. However, due to the fact that only five male ED patients participated in this study, we only could report mean scores for women with an ED.

### **Conclusion**

This is the first study of the FAS in both a community sample and a clinical sample of women with ED. Our research provides evidence that the Dutch version of the FAS is one-dimensional, has a good reliability and test-retest stability as well as adequate construct validity. The significant difference between FAS scores in the female ED sample and the female community sample indicates that female ED patients obviously have a lower body satisfaction concerning body functionality compared with healthy women. This study demonstrates promising psychometric results of the FAS and supports the use of the Dutch version of the FAS for clinical and research purposes.

### **Acknowledgments**

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## Chapter 4

**The protocol Positive Body Experience (PBE); introducing a psychomotor therapy intervention based on positive body exposure targeting negative body image in eating disorders****Body Movement and Dance in Psychotherapy, 2020: 1-15**

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**ABSTRACT**

Negative body experience is a core characteristic of eating disorders, and poses a serious risk factor for its development, maintenance and relapse. This underlines the importance of specific therapeutic attention to body experience. In the past ten years a body-oriented treatment protocol with the focus on *positive* body exposure, called ‘Protocol Positive body experience’ has been developed. The aim of this paper is to describe the scientific basis of the protocol and to give an impression of its content and structure, illustrated by clinical case vignettes. An important and innovative aspect of the protocol is to enhance not only aesthetic, but also functional and tactile body experience. The protocol enables body-oriented therapists and psychomotor therapists to treat negative body experience in an evidence-based way and facilitates further research to validate the effect of *positive* body exposure.

**Keywords:** Body experience, body image, positive body exposure, body functionality, eating disorders, psychomotor therapy

## INTRODUCTION

Eating disorders are associated with significant psychosocial impairment, high comorbidity and elevated mortality rates (Keski-Rahkonen & Mustelin, 2016). A negative or disturbed body image is part of the ‘core psychopathology’ of eating disorders (Fairburn, et al., 2003, p. 510) and thus constitutes a serious risk factor for the development and maintenance of eating disorders (Eshkevari et al., 2014). Moreover, if treatment of a negative or disturbed body image is ignored, the risk of relapse is high (Keel, et al., 2005). Acquiring and maintaining a healthy body image is therefore an important criterion for sustainable recovery (Noordenbos et al., 2018).

In the field of eating disorders, body image is often linked to appearance and weight concerns, but body image may be defined broader (Gaete & Fuchs, 2016). Besides aesthetic experience, such as satisfaction with bodily appearance, the concept also includes bodily awareness and functional and tactile experiences of the body. Therefore, body image may be considered a multidimensional concept (Cash, 2012). To emphasise this multidimensional nature, we prefer to use the term body experience (Scheffers et al., 2017) instead of body image. The term image is too much associated with only the aesthetic aspect of the concept.

Within the field of eating disorders, Gardner (2011) distinguishes between perceptual and attitudinal body experience problems. Perceptual body experience refers to the way individuals perceive the size and shape of their own body, which is often disturbed in patients with anorexia nervosa (Keizer et al., 2011). Keizer et al. (2013) found that patients with anorexia not only think that they are fat: their motor behaviour is consistent with the way they misjudge their real body size. If there is body size and shape misperception it is called disturbed body experience (Challinor et al., 2017).

Attitudinal body experience consists of affective, behavioural and cognitive components. Within the attitudinal dimension we speak of negative body experience (Rekkers et al., 2019). Patients mainly report an intense visual or aesthetic dissatisfaction, the affective component, with their own body or with parts of their body. This can be expressed in several behavioural components like frequently checking one’s body (Reas et al., 2002), avoiding looking at one’s body (Rosen et al., 1991), comparing one’s appearance negatively with that of others (Laker & Waller, 2020; Leahey et al., 2011), and also in cognitive components like criticizing and objectifying one’s body (Calogero et al., 2005). Negative body experience can

lead to a lack of self-confidence, to not feeling at home in one's body and to difficulties with physical contact (Gaete & Fuchs, 2016; Rekkers & Boerhout, 2018). Furthermore, it is associated with low self-esteem (O'Dea & Abraham, 2000), depression (Paxton et al., 2006), social anxiety (Junne et al., 2016), and impaired sexual functioning (Mangweth-Mazak et al., 2007).

The above-mentioned consequences underline the importance of specific attention to negative body experience in the treatment of eating disorders. Body-oriented psychotherapy (BOT) and psychomotor therapy (PMT) in particular focus on developing a healthy and positive relationship with the body and may be suitable forms of therapy to treat negative body experience (Emck & Scheffers, 2019). This focus has given rise to a treatment tradition of BOT and PMT in eating disorders in the Netherlands and Belgium (Butcher & Probst, 2019; Probst et al., 2013; Rekkers & Boerhout, 2018; Rekkers et al., 2019).

In the treatment of negative body experience, body exposure forms a widely used approach. During body exposure, patients stand in front of a mirror and look at their body, while being stimulated by the therapist to describe what they see, and what they think and feel about it (Jansen et al., 2013). The aim of body exposure is to improve body experience. Several variants of body exposure have been reported (Griffen et al., 2018): *pure* or *mere* exposure, *neutral* exposure and *positive* exposure.

During *pure* or *mere* exposure attention is focused on negatively experienced body parts, with the aim to reduce anxiety, disgust and avoidance regarding those body parts (Key et al., 2002; Moreno-Domínguez et al., 2012). During *neutral* exposure (Hilbert et al., 2002; Probst, 2008) patients are stimulated to focus on their whole body and instructed to use neutral and non-judgmental language to describe their body parts. Versions related to *neutral* exposure are: *guided* exposure (Moreno-Domínguez et al., 2012) and *mindful* exposure (Delinsky & Wilson, 2006). During *positive* exposure attention is exclusively focused on the positively experienced body parts (Jansen et al., 2013; Rekkers, 2005; Rekkers & Van Gulik, 2018).

In clinical practice, it is often unclear which variant of body exposure is applied, which procedure is followed and for what purpose (Jansen et al., 2013). Thus, it is important to obtain clarity on the effectiveness of the different exposure variants. Two non-clinical studies have compared *guided* and *pure* body exposure, with the *pure* variant found to be more effective (Díaz-Ferrer et al., 2017; Moreno-Domínguez et al., 2012). Moreno-Domínguez et al. (2012) found that after five sessions *mere* body exposure was more effective than *guided* exposure in reducing body discomfort within and between sessions. In addition,

Díaz-Ferrer et al. (2017) found that after six sessions, the *mere* exposure group showed faster habituation of subjective discomfort and a greater physiological response than the *guided* exposure group.

A study comparing *mere* and *positive* exposure (Jansen et al., 2013) showed slightly more favourable results for *positive* exposure. In this study, female students that were extremely dissatisfied with their body received five sessions of either *positive* or *mere* exposure. Both body exposure interventions were effective in the reduction of body dissatisfaction, but only the positive condition led to a decrease of dysfunctional body-related cognitions. Furthermore, the authors concluded that *positive* body exposure is a more pleasant intervention for patients, because it induces positive feelings from the start to the end, while *mere* body exposure initially induces a worsening of feelings (Jansen et al., 2016). This makes *mere* exposure possibly more intense for patients and increases the risk of dropping out of therapy.

Luethcke et al., (2011) compared three forms of body exposure: *mindful*, *neutral* and *positive* exposure. In all conditions mood improved and eating disorder symptoms decreased, but only the condition with the *positive* body exposure elicited a significant increase in body satisfaction. In light of the above-mentioned comparative studies the *positive* variant seems the best option in clinical practice.

Offering body exposure according to a structured and detailed protocol is more effective than having patients look at their own body in the mirror without a clear purpose (Jansen et al., 2013). For this reason, it is crucial that body exposure protocols are available. Until now, this has not been the case. In the past ten years a psychomotor therapy (PMT) protocol based on *positive* body exposure has been developed, called ‘protocol Positive Body Experience’ (PBE; Rekkers & Van Gulik, 2018, p.7). The structure and content of the protocol are based on techniques from both cognitive-behaviour therapy and body-oriented psychotherapy. Finetuning was done, using knowledge from clinical practice, the professional tradition of PMT and patients’ experiences in order to deliver matched care in various treatment settings.

The aim of this paper is to describe the scientific basis of the protocol and to give an impression of its content and structure, illustrated by clinical case vignettes. These clinical case vignettes were based on statements of different patients during their treatment with the protocol PBE and collected by the first author of this paper. To protect confidentiality these statements are merged into a fictitious patient Eva.

## PROTOCOL POSITIVE BODY EXPERIENCE

Development of the protocol PBE for *positive* body exposure was based on findings in descriptive studies by Jansen et al., (2005) and Tuschen-Caffier et al. (2015). Jansen et al. (2005) studied a non-clinical sample consisting of women without and women with eating disorder symptoms. The authors found that these two groups take opposite positions when looking at their own body and at other women's bodies. Looking at themselves, women with eating disorders symptoms focus on their self-defined negatively evaluated body parts, whereas women with no such symptoms focus on those parts of their body that they evaluate as most attractive. Looking at bodies of others, women with eating disorder symptoms compare themselves in a negative way, while the women without eating disorder symptoms use a positive perspective. Similarly, Tuschen-Caffier et al. (2015) reported that women without a history of an eating disorder dedicated nearly equivalent amounts of time when looking in a mirror at body parts that they identify as their most and their least attractive. Women with anorexia nervosa and bulimia nervosa on the contrary displayed longer and more frequent gazes focussed on their body parts experienced as most ugly compared to those experienced as most beautiful. The way women without eating disorders look at their own body and compare their body with others became the fundamental principle of *positive* body exposure and led to further clinical and experimental research (Jansen et al., 2013, Jansen et al. 2016; Glashouwer et al., 2016; Smeets et al., 2011).

In the protocol PBE (Rekkers & Van Gulik, 2018) both self-confrontation with the help of a mirror and hetero-confrontation, using comparison exercises, are key elements of the exposure exercises. During self-confrontation *positive* body exposure elicits a strong emotional response, because patients are not used to speak and feel positively about their own body. Although this causes distress, it also leads to new feelings of pride and satisfaction. Hetero-confrontation refers to looking at images of others (Probst, 2008) and in case of *positive* exposure comparing oneself positively (downward comparison). Leahey et al., (2011) studied comparing oneself positively and comparing oneself negatively (upward comparison) and concluded that downward comparison is an important protective factor against negative body experience.

As mentioned before, patients with eating disorders mainly focus on aesthetic aspects of their body. However, studies have shown that positive functional feelings and thoughts about one's own body or body parts can serve as an important ingredient of body satisfaction

(Alleva et al., 2019; Alleva et al., 2014; Frisé & Holmqvist, 2010; Wood-Barcalow et al., 2010). Functional body experience results from a functional perception of the body and refers to thoughts and feelings a person has about how one's body functions, including the physical ability and capabilities of the body (Abbott & Barber, 2010).

Frisé and Holmqvist (2010) used a qualitative design to study positive body experience of Swedish adolescents and found that satisfaction with their own appearance was characterized by acceptance of the body, but also by a functional view of the body. They concluded that encouraging mindsets also evaluating the body on functionality might help increase positive body satisfaction. Wood-Barcalow et al. (2010) found the same results in female university students in the United States. They also identified a functional attitude towards one's body to be one of the attributes of a positive evaluation of the body. Halliwell (2013) investigated female university students in the United Kingdom and observed that functional aspects of body image may serve as a protective psychological mechanism against body dissatisfaction.

Apart from functional aspects, tactile aspects of positively experienced body parts could also serve as an important ingredient of positive body experience. Tactile body experience refers to the primary tactile perception (Spitoni et al., 2010). It relates to thoughts and feelings about how one's body feels when touched by him or herself and/or by somebody else. Studies evaluating massage in patients with eating disorders show promising results (Field et al., 1998; Hart et al., 2001). Field et al. (1998) found a positive effect of massage therapy in the treatment of bulimia nervosa patients. Hart et al. (2001) observed increased scores of body satisfaction on the Eating Disorder Inventory in patients with anorexia nervosa when massage therapy was added to treatment as usual.

In accordance with these studies, body exposure in the protocol PBE is not limited exclusively to aesthetic aspects of the positively experienced body parts. During exposure patients are also guided to mention positive functional and tactile aspects, based on the evidence that this will further strengthen positive thoughts and feelings about these body parts. In addition to boosting functional and tactile aspects of positively experienced body parts during body exposure, a psychomotor therapist helps to expand and endorse these experiences by inviting the patient to engage in a variety of body-activities, such as positively experienced types of sports and dance, body-awareness exercises, touch exercises and massage forms. This broadening of the experience-based approach with the patient not only reflecting on but also experiencing the positive functional aspects of their body may serve as an enrichment of the concept of body exposure.

## CONTENT AND STRUCTURE PROTOCOL ILLUSTRATED WITH VIGNETTES

The protocol PBE offers guidelines and interventions which may be integrated in clinical multidisciplinary settings (day treatment and inpatient treatment) or may be applied in outpatient treatment. PBE needs to be applied by a professional who is specialized in working with eating disorders and is experienced in performing body and movement-orientated interventions as well as exposure techniques.

The intervention includes four phases (figure 1) and can be used in both individual and group treatment. Adjustments and additional exercises for group therapy are described per phase. In the first and the second phase the central themes are increasing knowledge about one's dysfunctional body experience and comparing this to a healthier body experience. These issues are important, because they are a prerequisite for a successful body exposure in the action phase. Patients are used to look at and to speak negatively about their own body. Therefore, a thorough preparation is essential to take patients out of their comfort zone and to motivate them to look at and speak about their body from a different positive perspective in the action phase.

*When Eva was 16 years she started to diet, thinking she was too fat. Although she became very thin because of this, she persevered with restricted eating and exercising two hours a day. After six months her parents became extremely worried and decided to look for help and had Eva consult a professional. During her admission to a specialized inpatient unit for eating disorders, she managed to gain weight and to limit excessive exercise. After she was discharged from the clinic, she was still very dissatisfied with her body, but her parents and sister helped and supported her to maintain a healthy eating and exercise behaviour. After high school she started a psychology study and went to live on her own. At the age of 19, Eva confessed to her twin sister that she binged and vomited again. Her sister motivated her to seek help again. During the assessment phase of an outpatient treatment, Eva realized that she had once more developed a serious eating disorder because the negative body experience had never disappeared during and after her first treatment. At this moment she mentions that she is disgusted with her body and never wears anything that will show her legs or arms, like skirts or short sleeves. In her mind, she constantly criticizes her body and in her social life she often compares her body negatively with the bodies of other women. She does not believe in the compliments about her body her boyfriend pays her and for a long time, there has been no sexual contact between them because she cannot endure her boyfriend seeing and touching her belly.*

In the *first phase* of the protocol PBE therapist and patient make an inventory of how the patient experiences her body, with the help of a body anamnesis and body experience questionnaires. Examples of such questionnaires are the Body Attitude Test (BAT; Probst et al., 1995), the Body Cathexis Scale (BCS; Tucker, 1981), and the Functionality Appreciation Scale (FAS; Alleva, et al., 2017).

*When the psychomotor therapist starts to discuss the results of the different body experience questionnaires, Eva indicates that filling out all the questions concerning her thoughts and feelings about her body felt confronting but that she decided to give honest answers. Together they look at a summary of Eva's scores, set against the scores of women with healthy body experience. Eva is genuinely surprised by seeing the differences. She says: 'I thought that everybody is dissatisfied with their own body, and it is really shocking to notice how much more negative I am. How silly it may sound; it feels good that I am seeking help for this and that I am not a poser where my body experience is concerned.'*

When the therapist and the patient have gathered enough information about the current body experience and the course of it in the past, the *second phase* of the protocol, emphasizing psycho-education, follows. In this phase the working mechanism of negative body experience and the factors that contribute to a healthy body experience are the main focus. Psycho-education in this protocol is largely experience-oriented, with new information made visible and physically perceptible. An example is the 'rope trick' (Sherman & Thompson, 2001). The rope trick is used as a tool to confront the patient with the differences between one's feelings, thoughts and desire with regard to the size of a body part and the actual size of that body part. In another exercise patients are confronted with their dominant visual perception of the own body and learn more about other ways to think or feel about the body, such as functional and tactile body experience. As a follow-up to this exercise, the therapist may mention research outcomes concerning the important role of the functional perception with respect to positive body experience (Frisén & Holmqvist, 2010; Wood-Barcalow et al., 2010). Finally, the scientific basis for the positive focus of the protocol will be clarified in this phase.

*Eva cannot believe her ears and eyes when the psychomotor therapist shows her study results concerning healthy body experience. It also scares her and she says: 'Suppose I am going to think more positive about my body, others will find me arrogant and a*



*boaster'. On the question of whether it bothers her to judge herself so negatively, she reacts with amazement. 'No, because than I am always prepared and I'd rather be realistic than happy'.*

The phase of psycho-education ends with the explanation of the purpose and effect of the used exposure technique. Because being confronted with one's own body in the mirror can evoke a lot of tension, a clear explanation of the working mechanism of exposure strengthens the motivation to take up this challenge. After this explanation therapist and patient together make a hierarchy list of positively experienced body parts.

*Eva has made a list of body parts she experiences positively. Her eyes are on top of the list because she thinks her eyes are the easiest to be positive about. Standing in front of the mirror for the first time, she describes her eyes as okay because they are normal in terms of colour and size. Then, she falls silent. With the support and stimulation of her psychomotor therapist, she goes on, using more positive words to describe her eyes. After the body exposure, she describes how strange and uncomfortable it was to say positive things about her eyes in front of the mirror, especially because all the time an inner voice was trying, sometimes successfully, to get her to look at body parts she is disgusted by.*

The actually body exposure takes place in the action phase, *phase three*. During this phase all positively experienced body parts on the hierarchy list are described positively in front of a mirror. It is important that the patient practices body exposure at home daily, because the patient has to get used to the positive perception and this requires practice and repetition. It may be necessary to use motivational interviewing (Miller & Rollnick, 2002) and metaphors (Barker, 1996) which help to stimulate and support motivation. During the sessions in the action phase sport and dance forms, body awareness, exercises, touch exercises and massage can be offered, to enrich and endorse the body exposure and make the patient more aware of and familiar with (positive) functional and tactile body experience.

*Feet are the third body part in Eva's hierarchy list. She says that before making this list, she never thought about her feet. She does not experience them in a negative way, but in her mind, they are not important and therefore neutral. She starts body exposure with positive aesthetical features such as size and form of her feet and the length of her toes. During the exposure, she becomes conscious of how important functional and tactile*

*aspects are for her. She is very happy that her feet are healthy and that she can walk and run with them, because hiking in nature and playing sports are very important for her. She also realizes how much she enjoys her boyfriend massaging her feet. With these positive statements about her feet, she ends the body exposure.*

As mentioned before, downward comparison can act as an important protective factor against negative body experience (Paxton & McLean, 2010). For this reason, body exposure in the form of hetero-confrontation is also integrated in the action phase.

*Eva shows, with some trepidation, her collage to the psychomotor therapist. The assignment was to collect pictures of other women from magazines and arrange them in a collage. The aim is to compare one's own body parts positively with those of other women in the collage. Eva's collage also contains pictures of models. When discussing the models, it is with a lot of hesitation that she points out a nose that is too big or eyes that are too small compared with her own. She feels ashamed of criticizing the women in the pictures and explains that she has never looked at other women's bodies this way.*

In the *fourth and last phase*: the stabilisation phase, the treatment focus lies on repetition and relapse prevention to continue and record obtained results. The treatment is completed with a joint evaluation including also a discussion of the results of a final assessment with the questionnaires on body experience.

## **CONCLUSION**

In eating disorders, a negative body experience is considered an important factor that indicates the severity of the symptoms and also helps maintain it. The use of evidence-based interventions seems appropriate for the treatment of negative body experience in eating disorders. Findings in descriptive studies and comparative clinical and non-clinical trials show that *positive* body exposure seems the best option in clinical practice. This has led to the development of a psychomotor therapy treatment called 'protocol Positive Body Experience', with the focus on *positive* body exposure. The aim of the protocol is to effectuate a more positive body experience, which is not limited exclusively to aesthetic aspects of the positively experienced body parts, but also includes mentioning and experiencing positive functional and tactile aspects.

The fact that *positive* body exposure is formalised in a protocol and presented in this article creates a foundation for further critical analysis and research on this subject in the future. At present the protocol is predominantly based on experiences of and research with adult western women with and without eating disorders. Further research is required for other groups with eating disorders, such as men, youngsters, and patients with different cultural backgrounds, who may all have distinct body experiences. Furthermore, randomized controlled trials are needed to learn more about the working mechanisms and to examine even better the effect of *positive* body exposure in specific eating disorder groups such as anorexia nervosa, bulimia nervosa and binge eating disorder.

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**Shifting the Focus: A Pilot Study on the Effects of Positive Body Exposure on Body Satisfaction, Body Attitude, Eating Pathology and Depressive Symptoms in Female Patients with Eating Disorders**

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## ABSTRACT

One of the most commonly used techniques for the treatment of body image problems in eating disorders (ED) is body exposure (BE). However, evidence of its effectiveness in clinical populations is scarce. In the Positive Body Experience (PBE) protocol, the focus of positive BE is on aesthetic, functional and tactile aspects of the body. The current study evaluates the outcomes of positive BE with regard to changes in attitudinal body image and eating pathology, as well as the factors that influence these changes, in a sample of 84 adult female patients with different EDs who did not receive any other treatment for their EDs during the period in which BE treatment occurred. The results show significant positive changes in attitudinal body image, ED behaviours and depressive symptoms, with depressive symptoms at baseline mediating the changes in attitudinal body image. This study indicates that the PBE protocol is a suitable intervention for reducing negative attitudinal body image in anorexia and bulimia nervosa patients, as well as those with binge eating disorder. Furthermore, the results suggest that positive non-weight-related and functional body satisfaction are strong catalysts for change and that depressive symptoms play an important role in the ability to change. Additional RCTs are needed to gain more insight into the effects of PBE.

**Keywords:** eating disorders; attitudinal body image; body satisfaction; body attitude; body exposure; mirror exposure; depressive symptoms

## INTRODUCTION

Body image problems are a core feature of eating disorders (EDs) [1]. According to several authors, the different types of EDs, namely anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED) and other specified eating and feeding disorder (OSFED), have the same maintaining mechanism: the over-evaluation of shape and weight and the control thereof, leading to body image problems. Such problems are a serious risk factor for the development and maintenance of EDs [2-3]. Therefore, targeting body image problems in treatment is crucial and associated with better overall treatment outcomes [4]. Moreover, the risk of relapse is high if body image problems are not adequately treated [5]. Therefore, research on interventions aimed at positively addressing body image problems has substantial public health significance [6].

Body image problems can be divided into perceptual and attitudinal body image problems [7-8]. The perceptual dimension refers to a disturbance in the perception of one's own body [9]. The attitudinal dimension refers to affective, behavioural and cognitive components in the relationship with one's own body. It manifests in body dissatisfaction and dysfunctional behaviour, such as body-checking [10] and body avoidance [11], as well as on a cognitive level, e.g., criticizing and objectifying one's body [12] and comparing one's appearance negatively with that of others [13-14].

In the treatment of attitudinal body image problems, body exposure (BE) is a widely used approach [15-17]. During BE, patients stand in front of a mirror and look at their bodies while they are encouraged by the therapist to describe what they think and feel about their bodies [18]. BE has been shown to benefit individuals with high levels of body dissatisfaction and patients with EDs [16]. Tanck, Hartmann, Svaldi and Vocks [19] concluded that BE was effective at improving the affective, behavioural and cognitive components of a negative attitudinal body image.

Different variants of BE have been described [16]; they use three different cognitive restructuring approaches. In neutral BE, the subject is instructed to describe their reflection in the mirror, using non-judgmental descriptions of their appearance [20-21]. In pure BE, the emphasis lies on describing the thoughts and emotions that arise while looking at the negatively experienced body parts [22-23]. In positive BE, patients are encouraged to use language with positive valence while looking at their self-defined most attractive body parts [24, 17, 25]. Griffen, Naumann and Hildebrandt [16] reported on a small number of

randomized trials in which these different approaches were compared using data from non-clinical groups composed of body-dissatisfied women ([15, 26-27, 23]. In the comparison of non-judgmental BE and pure BE, both therapeutic techniques led to equal improvements with respect to positive and negative thoughts, but the pure variant was superior for reducing distress both within and between sessions [15,23]. Luethcke, McDaniel and Becker [27], found that positive BE was superior to non-judgmental descriptions in terms of reducing body dissatisfaction. Furthermore, Jansen et al. [26], and later Tanck et al. [19], concluded that positive BE seemed to be the more favourable option, as the pure variant resulted in heightened negative affect during BE and might therefore be experienced as more aversive. Furthermore, Griffen et al., [16] emphasized that the few clinical trials of BE have been small, with experimental designs, and that there is a great need for further clinical trials in specific ED groups (AN, BN and BED). Recently, Tanck et al., [25] also concluded that evidence on the effectiveness of different forms of BE in clinical populations is lacking.

Therefore, further research is needed, especially within a clinical context. This is particularly important since the severity of symptoms and co-morbidities may influence treatment results. In particular, depressive symptoms often co-occur with EDs [28-29] and have been found to be a predictor of body dissatisfaction in women with bulimia nervosa [30-31]. Furthermore, body dissatisfaction is associated with depressive symptoms [32], and Murray, Rieger and Byrne [33] found that people with depressive symptoms judge their bodies more negatively.

In this paper, a study is presented with the focus on positive BE using the 'Positive Body Experience' (PBE) protocol [34, 17]. In this protocol, based on experimental research [35-36] and further non-clinical research into positive BE [24, 18, 26], guided self-confrontation with the help of a mirror is the key element. During this self-confrontation, patients are instructed to describe their positively experienced body parts in a positive way and to refrain from looking at or speaking about their negatively experienced body parts. In addition, the PBE protocol not only addresses the aesthetic aspects of positively experienced body parts but also pays attention to positive functional and tactile aspects. These aspects of positively experienced body parts could serve as an important ingredient of positive body image [1] [17].

The approach used in the PBE protocol was based on studies that show that a positive functional perception of the body or body parts can serve as a protective psychological mechanism against body dissatisfaction [37-41]. Patients with EDs tend to focus on aesthetic aspects when they evaluate their bodies and base body satisfaction on physical attractiveness.

To help improve body image, it is important to broaden this perspective and shift attention from the way the body looks to the functional aspects of the body, i.e., what the body can do [42].

The objective of the current pilot study was to evaluate the results of the PBE protocol in female patients with EDs. A three-way approach was chosen: The first aim was to assess the change in body image after participating in PBE and whether this change was clinically relevant. The second aim was to explore whether patients with different EDs benefitted differently from the PBE protocol. We hypothesized that patients with AN and BN would profit most because body image problems are explicitly mentioned in the DSM classifications for these conditions, which is not the case for BED. The third and last aim was to examine the factors that influenced changes in attitudinal body image. We assumed that the severity of the ED before the start of treatment would negatively mediate the extent of the change in body image found post-treatment. The second assumed factor was the severity of depressive symptoms before treatment. Since ED recovery is associated with the absence of major depressive symptoms [43], we assumed that the presence of these symptoms might also negatively mediate the treatment of body image problems.

## **MATERIALS AND METHODS**

### **Participants, Design and Procedure**

Participants were female patients attending an outpatient clinic specialized in the treatment of EDs in the Netherlands between January 2010 and June 2021. All participants were treated for their negative body image with the PBE protocol and had a primary diagnosis of an ED (AN, BN, BED or OSFED), which was assessed by an experienced clinician based on DSM-IV criteria before 2017 and DSM-5 criteria from 2017 onwards. From 2010 to 2017, BED was separately diagnosed within the Eating Disorder Not Otherwise Specified (EDNOS) group. During the treatment for negative body image, no other treatment targeting ED pathology or body image took place. In general, sessions took place once every two weeks. As this study was designed as a pilot test of the primary changes after treatment with the PBE protocol, a single-arm pretest/post-test design was used.

Only Dutch-speaking participants over 18 were included. From a sample of 121 patients, the data of 13 patients were removed for the following reasons: younger than 18 ( $n =$

3); English-speaking ( $n = 5$ ); no permission for research ( $n = 5$ ). From the remaining sample ( $n = 108$ ), 24 patients had no post-treatment data for a variety of reasons: premature termination of sessions because of changes in residence, work or study ( $n = 14$ ); referred to a more intensive treatment for their ED ( $n = 3$ ) or for comorbid disorders ( $n = 3$ ); dissatisfaction with the treatment ( $n = 2$ ); financial circumstances ( $n = 1$ ); reasons unknown ( $n = 2$ ). This resulted in a clinical sample of 84 female participants with pre- and post-measurements. In this sample, 26 women (31%) had a diagnosis of AN, 16 (19%) BN, 11 (13%) BED and 31 (37%) OSFED.

According to the Dutch law on medical scientific research with human subjects, all patients participating in this study signed an informed consent form with a standard format, as prescribed by the Dutch Central Committee on Research Involving Human Subjects (CCMO) (see [www.ccmo.nl](http://www.ccmo.nl), accessed on 1 September 2022). The questionnaires the participants filled out and the treatment the participants followed were both components of treatment as usual (TAU). This means there were no invasive interventions. In such cases, ethical approval of the CCMO or another specialized external committee is not required in the Netherlands.

The assessment battery consisted of four questionnaires, two for measuring attitudinal body image ( $n = 84$ ), one for measuring ED pathology ( $n = 63$ ) and one for measuring depression ( $n = 78$ ). There were no missing data in the completed questionnaires. The questionnaires were filled out on the participants' own time on private devices. Six participants preferred to fill out the questionnaires on paper.

## Measures

The Body Cathexis Scale (BCS) [44]; Dutch version: Dorhout, Basten, Bosscher and Scheffers [45] measures the degree of satisfaction with the appearance and functionality of different parts of the body. The BCS consists of 40 items rated on a 5-point Likert scale (from 1 = 'very dissatisfied' to 5 = 'very satisfied'). Higher scores indicate a higher level of body satisfaction. The construct and concurrent validity of the original scale is good [46-48]. Research on the Dutch version of the BCS in both clinical ( $n = 238$ ) and non-clinical ( $n = 1060$ ) samples revealed three subscales: functional body satisfaction, weight-related body satisfaction and non-weight-related body satisfaction [49]. Internal consistency was adequate for both samples, with Cronbach's  $\alpha = 0.90$  for the total scale and Cronbach's  $\alpha = 0.83-0.85$  for the subscales in the clinical sample [49].

The Body Attitude Test (BAT) [50] measures subjective body experience and attitude towards one's own body. The BAT consists of 20 items rated on a 6-point Likert scale (range

0-5). The maximum score is 100, and the higher the score, the more body attitude deviates from that of the general population. The internal consistency is good, with Cronbach's  $\alpha = 0.93$ ; test-retest reliability is also good (ICC = 0.92), as are convergent and divergence validity [50-53].

The Eating Disorder Examination Questionnaire (EDE-Q) [54]; Dutch version: Aardoom, Dingemans, Slof Op't landt and Van Furth [55] measures ED symptoms. The EDE-Q consists of 36 items, of which 22 determine the total score. These 22 items comprise four subscales, assessing restraint, shape concern, weight concern and eating concern over the previous 28 days; questions are answered on a 7-point Likert scale ranging from 0, 'not one day', to 6, 'every day'. Higher scores are indicative of higher levels of ED psychopathology. The construct validity and internal consistency (with a Cronbach's alpha of 0.95 for the total scale and values of Cronbach's alpha varying from 0.81 to 0.91 for the subscales) of the Dutch version are good [55].

The Beck Depression Inventory-II (BDI-II) [56]; Dutch version Van der Does [57] measures the degree of depressive symptoms. The BDI-II consists of 21 items rated on a 4-point Likert scale (ranging from 0 = symptoms absent to 3 = severe symptoms). Total scores range between 0 and 63, with higher scores reflecting higher levels of depression. The reliability and validity of the Dutch version of the BDI-II have been supported by the findings of previous works [58, 57].

The recorded demographics were age, height, weight and level of education at pre- and post-treatment. In addition, the number of sessions that took place was monitored.

### **The Positive Body Experience Protocol (PBE)**

The PBE protocol (for a more thorough description and an overview of the theoretical foundation, see Rekkers et al., [17] (in English) and Rekkers and Van Gullik, [34] (in Dutch)) includes four phases and can be used in both individual and group treatment. In the first and the second phases, *the goals* are to increase knowledge about one's dysfunctional body experience (phase one) and to receive psycho-education about healthy body image (phase two). These issues are important because they are a prerequisite for successful body exposure. The actual BE takes place in the action phase (phase three), with a maximum of eight sessions. Both self-confrontation with the help of a mirror and hetero-confrontation using comparison exercises are key elements of BE. Hetero-confrontation refers to looking at images of others and, in the case of BE, comparing oneself positively with these images (downward comparison). In the fourth and last phase, the treatment focus lies on stabilization,

including the repetition of BE and relapse prevention. The total number of sessions in the PBE protocol can vary between 12 and 17 sessions, depending on how much psycho-education before BE and how much stabilization after the action phase are required.

### **Statistical Analysis**

Descriptive analyses of the characteristics of the participants, the length of the intervention and its outcomes are presented in percentages, means and standard deviations, respectively. Associations between body satisfaction, body attitude, ED pathology and depressive symptoms at the start were analysed using Pearson correlations to enhance insight into the data; correlations were considered large if the value of  $r$  was between 0.50 and 1.0, medium if it was between 0.29 and 0.49 and small if it was between 0.10 and 0.29 [59].

In order to assess the outcome of the PBE protocol, repeated measures analyses of variance were calculated with ‘time’ (pre- and post-intervention) as the within-subject factor. This was performed four times using data from the total group, with body satisfaction (BCS), body attitude (BAT), ED pathology (EDE-Q) and depression scores (BDI) as the dependent variables. Additionally, the clinical relevance of the changes found was determined using the MCID [60-61], defined as the standard deviation of the theoretical total distribution from the primary outcome multiplied by 0.5. Cohen’s  $d$  was used to determine effect sizes in the univariate tests and was considered large if  $d > 0.80$ , medium if the value of  $d$  was between 0.50 and 0.79 and small if its value was between 0.20 and 0.49 [62].

As a second step, analyses were conducted that focused specifically on the subgroups of participants with different types of ED diagnoses. To obtain a better picture of the differences in treatment effects for the various diagnostic ED groups, the 31 participants with a primary diagnosis of OSFED were, according to their clinical presentations, added to one of the three other diagnostic groups: AN (previous  $n = 26$ ; new total group  $n = 46$ , 55%), BN (previous  $n = 16$ ; new total group  $n = 25$ , 30%) and BED (previous  $n = 2$ ; new total group  $n = 11$ , 15%). Analyses were performed focusing on the differences between the three groups in terms of both characteristics and pre- and post-intervention measurements. To compare the extent of the changes following positive body exposure between the different diagnostic groups, change scores (post-measure minus pre-measure) were calculated for BCS, BAT and EDE-Q; in addition, an ANOVA test of variance was conducted. In both sets of analyses, Levene’s test was used to test for the homogeneity of the variances for all three groups. Depending on the outcome, the Tukey post hoc test or the Games–Howell post hoc test was chosen to gain insight into which of the groups could account for the differences between the

groups. Sensitivity analyses were conducted to compare the outcomes with the outcomes of the ANOVA analyses using the original four diagnostic groups.

The third step in the analysis encompassed a mediation analysis, with depressive symptoms (BDI-II) and the severity of the ED (EDE-Q) at the start of therapy as mediators of the relationship between the pre- and post-measurement outcomes; body satisfaction (BCS) and body attitude (BAT) were analysed separately. To perform the mediation analyses, the PROCESS Macro in SPSS, which was developed by [63] Preacher and Hayes (2004), was used.

In all analyses, a value of  $p < 0.05$  was considered significant. Data were controlled for input errors and normality. All data were analysed using IBM SPSS version 24.0.

## RESULTS

### Characteristics of the Sample, Number of Sessions and Primary Outcomes

The mean age of the sample (84 female participants) was 26.67 ( $SD = 5.09$ , range = 19–46). Most participants had a moderate (28.6%) or high (63.1%) level of education; 8.3% of the participants had a lower level of education. Table 1 shows the characteristics of the total group and the three diagnostic groups, namely AN, BN and BED. The mean age of the BED group was higher than those of the AN and BN groups (Tukey post hoc test  $p = 0.035$  and  $0.037$ , respectively). The mean BMI was 22.55 ( $SD = 4.2$ ) at baseline and 22.60 ( $SD = 4.2$ ) at discharge. As could be expected, there were significant differences between participants in the three diagnostic groups for both BMI measures, with values for the AN group significantly lower than those for the BN group ( $p = 0.02$  for pre-treatment BMI and  $p = < 0.01$  for post-treatment BMI); the BN group, in turn, had values significantly lower than those of the BED group ( $p < 0.01$  for both measures). The mean BMI values for the original four diagnostic groups can be found in the note of Table 1. Table 1 also shows the mean number of sessions of the PBE protocol that participants received. A total of 25% of the participants received 11 sessions or less, 25% 11 to 13 sessions, 25% 13 to 17 sessions and 25% more than 17, with a maximum of 27. The participants with AN received the highest average number of sessions. This average was significantly more than the average for the participants with BN ( $p = 0.03$ ), who received the lowest average number of sessions. There was no significant difference in the average number of sessions between participants with AN and BED or between those with BN and BED.



**Table 1.** Characteristics of the total sample and the three diagnostic groups.

	<b>Total</b> <b>(n = 84)</b>	<b>AN</b> <b>(n = 46)</b>	<b>BN</b> <b>(n = 25)</b>	<b>BED</b> <b>(n = 13)</b>	<b>F</b>
	<b>M (SD)</b>	<b>M (SD)</b>	<b>M (SD)</b>	<b>M (SD)</b>	
Age	25.97 (5.02)	25.49 (4.35)	25.01 (4.46)	29.51 (5.02)	3.72 *
BMI—pre #	22.55 (4.21)	20.53 (2.57)	22.38 (2.91)	30.01 (4.21)	66.58 **
BMI—post	22.64 (4.20)	20.58 (2.44)	22.42 (2.60)	30.25 (2.60)	74.97 **
Sessions	14.15 (4.71)	15.26 (4.86)	12.32 (4.45)	13.77 (3.68)	3.40 *

Note: *M* = mean, *SD* = standard deviation, AN = anorexia nervosa, BN = bulimia nervosa, BED = binge eating disorder, BMI = body mass index, \*  $p < 0.05$ , \*\*  $p < 0.01$ . Mean BMI values for the original four diagnostic groups: AN ( $M = 19.03$ ,  $SD = 1.18$ ), BN ( $M = 22.64$ ,  $SD = 3.44$ ), BED ( $M = 30.57$ ,  $SD = 1.76$ ) and OSFED ( $M = 22.59$ ,  $SD = 2.55$ ).

Table 2 shows the results of the primary outcomes and possible mediators for the total sample and the three diagnostic groups. With regard to attitudinal body image, participants with AN showed higher BCS-Weight scores at baseline than participants with BED ( $p = 0.03$ ), with no significant differences between the AN and BN groups ( $p = 0.07$ ) or between the BN and BED groups ( $p = 0.68$ ). For the AN group, BAT scores were also significantly lower than for the BED group ( $p < 0.01$ ); again, there were no significant differences between the AN and BN groups ( $p = 0.07$ ) or between the BN and BED groups ( $p = 0.73$ ). With regard to the baseline scores for the EDE-Q total, the EDE-Q subscale for eating concern and the EDE-Q subscale for restraint, participants with BN had significantly higher scores than participants with AN ( $p = 0.04$ ,  $p < 0.01$  and  $p = 0.02$ , respectively). The differences between the BN and BED groups were only significant for the EDE-Q subscale for restraint ( $p < 0.01$ ). No significant differences in regard to the EDE-Q subscale for weight concern or the EDE-Q subscale for shape concern were found between the three diagnostic groups.

**Table 2.** Pre- and post-treatment outcomes and possible mediators for the total sample and the three diagnostic groups, with ANOVA results for the between-group differences.

	Pre-Treatment				Post-Treatment				<i>F</i>
	Total ( <i>n</i> = 84)	AN ( <i>n</i> = 46)	BN ( <i>n</i> = 25)	BED ( <i>n</i> = 13)	Total ( <i>n</i> = 84)	AN ( <i>n</i> = 46)	BN ( <i>n</i> = 25)	BED ( <i>n</i> = 13)	
BCS total	2.87 (0.46)	2.91 (0.47)	2.85 (0.45)	2.83 (4.99)	3.37 (0.50)	3.34 (0.53)	3.44 (0.43)	3.39 (0.54)	0.34
- BCS-NW	3.16 (0.55)	3.17 (0.59)	3.13 (0.47)	3.13 (0.57)	3.62 (0.48)	3.57 (0.49)	3.72 (0.46)	3.39 (0.51)	0.88
- BCS-W	1.99 (0.69)	2.18 (0.70)	1.82 (0.64)	1.63 (0.61)	2.67 (0.78)	2.77 (0.80)	2.64 (0.74)	2.49 (0.81)	0.73
- BCS-F	2.92 (0.61)	2.86 (0.49)	2.98 (0.71)	3.50 (0.73)	3.41 (0.61)	3.32 (0.59)	3.54 (0.57)	3.49 (0.73)	1.24
BAT	61.66 (15.05)	57.21 (15.13)	65.16 (12.99)	72.61 (11.80)	43.07 (14.38)	41.84 (15.79)	42.98 (10.91)	47.62 (15.36)	0.82
EDE-Q total #	3.51 (0.88)	3.29 (0.87)	3.90 (0.92)	3.66 (0.64)	2.31 (0.97)	2.25 (1.03)	2.40 (0.96)	2.38 (0.82)	0.16
- EDE-Q-R	2.74 (1.16)	2.58 (1.22)	3.39 (0.92)	2.28 (0.88)	1.61 (1.06)	1.55 (1.10)	1.68 (0.98)	1.68 (1.14)	0.12
- EDE-Q-EC	2.66 (1.28)	2.21 (1.03)	3.49 (1.51)	2.86 (0.99)	1.57 (0.97)	1.43 (1.05)	1.81 (0.86)	1.64 (0.80)	0.91
- EDE-Q-WC	4.19 (1.02)	4.02 (1.10)	4.25 (0.91)	4.72 (0.71)	2.90 (1.04)	2.82 (1.06)	2.94 (1.07)	3.10 (0.99)	0.31
- EDE-Q-SC	4.58 (1.02)	4.44 (1.02)	4.70 (1.11)	4.87 (0.88)	3.08 (1.30)	3.01 (1.31)	3.21 (1.42)	3.11 (1.67)	0.14
BDI-II #	17.02 (9.16)	16.76 (8.70)	17.46 (10.53)	17.09 (8.59)	9.33 (7.26)	10.50 (8.67)	7.44 (5.28)	9.04 (2.94)	1.43

Note: AN = anorexia nervosa, BN = bulimia nervosa, BED = binge eating disorder, BMI = body mass index, BCS = Body Cathexis Scale, BCS-NW = Body Cathexis Scale-Non-Weight, BCS-W = Body Cathexis Scale-Weight, BCS-F = Body Cathexis Scale-Functionality, BAT = Body Attitude Test, EDE-Q = Eating Disorder Examination Questionnaire, EDE-Q-R = Eating Disorder Examination Questionnaire-Restrant, EDE-Q-EC = Eating Disorder Examination Questionnaire-Eating Concern, EDE-WC = Eating Disorder Examination Questionnaire-Weight Concern, EDE-SC = Eating Disorder Examination Questionnaire-Shape Concern, BDI-II = Beck Depression Inventory-II. \*  $p < 0.05$ ; \*\*  $p < 0.01$ . For EDE-Q,  $n = 65$  (AN 36, BN 17 and BED 10), and for BDI-II,  $n = 78$  (AN 44, BN 24 and BED 10).

### Correlations between Pre-Treatment Measures

At pre-treatment, almost all outcomes were significantly correlated, with correlations varying from small to large (Table 3). There were five exceptions. BCS total score, BCS-Non-weight and BCS-Functional had no or small non-significant associations with ED symptoms (EDE-Q); BCS-Functional had no or small non-significant associations with BCS-Weight and Body attitude (BAT).

**Table 3.** Correlation matrix for the pre-treatment measurements.

Measures	BCS-NW	BCS-W	BCS-F	BAT	EDE-Q #	BDI-II #
BCS-total	0.853 **	0.639 **	0.606 **	-0.413 **	-0.236	-0.420 **
BCS-NW		0.421 **	0.470 **	-0.220 *	0.004	-0.244 *
BCS-W			0.043	-0.568 **	-0.416 **	-0.286 **
BCS-F				-0.143	0.045	-0.413 **
BAT					0.386 **	0.492 **
EDE-Q						0.343 **

*Note:* BCS = Body Cathexis Scale, BAT = Body Attitude Test, EDE-Q = Eating Disorder Examination Questionnaire, BDI-II = Beck Depression Inventory-II, BCS-NW = Body Cathexis Scale-Non-Weight, BCS-W = Body Cathexis Scale-Weight, BCS-F = Body Cathexis Scale-Functionality, \*  $p < 0.05$ , \*\*  $p < .01$ . For EDE-Q,  $n = 63$ ; for BDI-II,  $n = 78$ .

### Differences in Outcomes for the Whole Group

In order to assess the outcomes of the PBE protocol, repeated measures analyses of variance were calculated with ‘time’ (pre- and post-intervention) as the within-subject factor. There was a statistically significant difference over time for all outcomes, namely body satisfaction (BCS), including all subscales; body attitude (BAT); ED pathology (EDE-Q), including all subscales; and depressive symptoms (BDI). The clinical relevance of all the observed changes was significant according to the MCID (see Table 4).

**Table 4.** Means (*M*) and standard deviations (*SD*) of the differences between pre- and post-intervention scores for all outcomes, results of repeated measure analyses (*F*) and minimal clinically important difference (MCID), test of the difference and effect sizes (Cohen's *d*).

	Mean Differences ( <i>SD</i> )	<i>F</i>	<i>SEM</i>	<i>MCID</i>	<i>t</i>	Cohen's <i>d</i>
BCS Total ( <i>n</i> = 84)	0.50 (0.45)	101.34 **	0.05	0.21	-10.07 **	1.04
BCS-NW	0.46 (0.52)	34.85 **	0.06	0.26	-9.08 **	0.89
BCS-W	0.70 (0.71)	82.47 **	0.08	0.36	-8.24 **	0.92
BCS-F	0.49 (0.58)	61.01 **	0.06	0.29	-7.81 **	0.80
BAT Total ( <i>n</i> = 84)	-18.89 (13.79)	157.60 **	1.50	0.78	12.55 **	1.28
EDE-Q Total ( <i>n</i> = 63)	-1.20 (1.13)	71.49 **	0.14	0.57	8.45 **	1.29
EDE-Q-R	-1.14 (1.52)	35.68 **	0.19	0.76	5.793.06 **	1.52
EDE-Q-EC	-1.09 (1.29)	44.68 **	0.16	0.65	6.68 **	0.96
EDE-Q-WC	-1.30 (1.28)	64.53 **	0.16	0.64	8.03 **	1.25
EDE-Q-SC	-1.50 (1.34)	79.11 **	0.17	0.67	8.89 **	1.28
BDI-II Total ( <i>n</i> = 78)	-7.76 (7.76)	77.58 **	0.87	3.88	8.81 **	0.93

Note: BCS = Body Cathexis Scale, BCS-NW = Body Cathexis Scale-Non-Weight, BCS-W = Body Cathexis Scale-Weight, BCS-F = Body Cathexis Scale-Functionality, BAT = Body Attitude Questionnaire, EDE-Q = Eating Disorder Examination Questionnaire, EDE-Q-R = Eating Disorder Examination Questionnaire-Restraint, EDE-Q-EC = Eating Disorder Examination Questionnaire-Eating Concern, EDE-WC = Eating Disorder Examination Questionnaire-Weight Concern, EDE-SC = Eating Disorder Examination Questionnaire-Shape Concern, BDI-II = Beck Depression Inventory-II, *SEM* = standard error of the mean, *t* = *t*-score, \*\* *p* < 0.01.

### Differences in Outcomes for the Three Diagnostic Groups

To compare the changes over time between the three diagnostic groups for all outcome measures, a one-way ANOVA was performed, with the change scores (differences post-intervention minus pre-intervention) calculated for the BCS, BAT, EDE-Q and BDI scales (see Table 5). There was only one statistically significant difference in the pre–post change between the three diagnostic groups, which was for the outcome measure BAT  $F(2,81) = 3.715, p = 0.029$ . A Games–Howell post hoc test revealed that the extent of change was significantly lower for the AN group ( $M = -15.37, p = 0.04$ ) than for the BED group ( $M = -25.00$ ). There were no statistically significant differences between the BN group and the BED group ( $p = 0.781$ ) or the AN group ( $p = 0.128$ ). For the sensitivity analyses, one-way ANOVAs were performed on the change scores a second time, but instead of three groups, the original four diagnostic groups, including one OSFED group, were used. These analyses showed comparable results, with no significant differences between the four diagnostic groups for the BCS, EDE-Q or BDI scales. The results were different with regard to changes in BAT scores: in the analyses using three groups, lower scores were found for the AN group, but in the analyses using four groups, no between-group differences were found ( $F = 1.29, p = 0.285$ ).

**Table 5.** ANOVA with mean difference scores for the outcome measures BCS, BAT, BDI and EDE-Q for the different diagnostic groups.

	<b>AN</b> <i>M (SD)</i> <i>(n = 46)</i>	<b>BN</b> <i>M (SD)</i> <i>(n = 25)</i>	<b>BED</b> <i>M (SD)</i> <i>(n = 13)</i>	<b>Total</b> <i>M (SD)</i> <i>(n = 84)</i>	<i>F</i>
BCS	0.43 (0.47)	0.58 (0.44)	0.56 (0.41)	0.9 (0.45)	1.10
BAT	-15.37 (13.52)	-22.18 (14.02)	-25.00 (11.28)	-18.89 (13.79)	3.72 *
BDI #	-6.26 (7.45)	-10.02 (8.10)	-8.31 (7.60)	-7.69 (7.76)	1.91
EDE-Q #	-1.04 (1.11)	-1.50 (1.27)	-1.28 (0.88)	-1.20 (1.13)	1.01

*Note:* AN = anorexia nervosa, BN = bulimia nervosa, BED = binge eating disorder, BCS = Body Cathexis Scale, BAT = Body Attitude Questionnaire, EDE-Q = Eating Disorder Examination Questionnaire, BDI-II = Beck Depression Inventory-II. For EDE-Q,  $n = 61$  (AN 36, BN 17 and BED 10), and for BDI-II,  $n = 78$  (AN 44, BN 24 and BED 10). \*  $p < 0.05$ .

### Mediation Analyses

The results of the mediation analysis with the BCS at the end of therapy as the dependent variable showed that the level of depressive symptoms at baseline was not a significant mediator of the relationship between body satisfaction at baseline and final body satisfaction. In the model with baseline BDI as mediator, the direct of BCS at start on BCS final was 0.62 (s.e. 0.11;  $p < 0.01$ ), the total effect 0.62 (s.e. 0.10;  $p < 0.01$ ) and with no significant direct effect of BDI on BCS final (0.00, s.e. 0.00,  $p = 0.94$ ). In contrast, depressive symptoms at baseline were a significant mediator in the relationship between body attitude at baseline and body attitude at the end of therapy. The direct effect of BAT at baseline on BAT at the end of treatment was 0.43 (s.e. 0.11,  $p < 0.01$ ) and the total effect 0.53 (s.e. 0.09,  $p < 0.01$ ) with a direct effect of BDI on BAT final of 0.34 (s.e. 0.17,  $p < 0.05$ ). Since the relationships between the initial and final measurements on BAT without a mediator were also significant mediation was partial.

Results showed that the severity of the ED at baseline was not a significant mediator in the relationship between body satisfaction at baseline and at the end of therapy. In the mediation model there was no significant effect of EDE-Q on final BSC (0.045, s.e. = 0.06,  $p = 0.48$ ). In addition, the severity of the ED at baseline was not a significant mediator in the relationship between body attitude at baseline and at the end of therapy (-1.125, s.e. = 1.65,  $p = 0.50$ ).

## DISCUSSION

This explorative study evaluated the treatment of negative body image using the PBE protocol in female participants with EDs in a clinical setting. Results show that positive body exposure led to significant positive changes in attitudinal body image, with large effect scores. In addition, eating pathology and depressive symptoms show a significant decrease, with large effect scores. For clinical practice, it is important to look into the clinical relevance of research results, because statistical significance does not necessarily mean clinical relevance [61]. According to the MCID, all difference scores for all outcome measures were clinically relevant, because all average difference scores exceeded the MCID threshold. This implies that, for the average participant, there was a clinically relevant difference in the improvement of attitudinal body image and the reduction in eating pathology and depressive symptoms after following the PBE protocol.

A remarkable finding was that the BCS-Weight subscale scores were also significantly higher after following the PBE protocol. During the body exposure treatment, the participants were instructed to focus exclusively on positively experienced body parts and to refrain from looking at or speaking about negatively experienced body parts, which are often weight-related body parts. A possible explanation for the increase in satisfaction for weight-related body parts may relate to the assumption that when positively experienced body parts are more prominent, the focus on negatively experienced weight-related body parts may shift to the background, which could result in weight-related body dissatisfaction being experienced as less negative by the patient. In addition, there were no correlations found in this study between eating pathology and non-weight-related or functional body satisfaction. This lack of coherence may be clinically relevant as a possible motivation for initiating change. Looking at the present study, mitigating weight-related body dissatisfaction by focusing on non-weight-related and functional body satisfaction [64-65] seemed to work.

Another noteworthy finding was that the score changes for all EDE-Q subscales, including the subscales for restraint and eating concern, which are related to eating behaviour, were significant. These results imply that the treatment of attitudinal body image with positive BE alone can create a significant reduction in disturbed eating behaviour. It also raises an interesting question as to whether body image should be regarded as one of the sources of EDs, and not only a maintaining factor, following the definition of Fairburn et al. (2003). In this context, Phillipou, Castel and Rossell [66] also posed the question of whether the conceptualization of AN and BN as 'EDs' was simplistic and misleading; they even argued for another classification system, classifying AN and BN not as EDs but as body image

disorders. This would, according to the authors, result in more emphasis being placed on body image problems, leading to fewer misperceptions and comments focused on eating behaviour, along with a change in the research agenda concerning EDs. Regardless of whether or not a new classification is considered, the results of the EDE-Q in this study support the notion that the effective treatment of body image problems is probably essential in the treatment of EDs [67-68].

Contrary to expectations, there was almost no difference in the effectiveness of positive BE for patients with different EDs. The only exception was the change in body attitude, as measured by the BAT, which was significantly larger for the BED group than for the AN group. Even the fact that the BED group benefitted from positive body exposure is noteworthy, because body image problems are not explicitly mentioned as a diagnostic criterion in the DSM-5 classification of BED, in contrast with AN and BN. Nevertheless, Lewer, Bauer, Hartmann and Vocks [69] found in their narrative review that attitudinal body image problems, such as body dissatisfaction, overconcern with weight and shape, body-related checking and avoidance behaviour, also occur in BED. In our sample, we see that the body dissatisfaction scores of the participants with BED corresponded with those of AN and BN participants; for body attitude, as measured with the BAT, BED scores were even more negative compared with those of the AN and BN groups. In line with these findings, Krohmer, Naumann, Tuschen-Caffier and Svaldi [70] stated that there is growing evidence that body image problems also play an important role in the development and maintenance of BED. At the same time, Lewer et al. [69] concluded that research on treatments focusing directly on body image problems in BED is still scarce. This study contributes to knowledge on how to improve therapeutic options for BED.

We examined two factors that possibly influenced the change in attitudinal body image. We assumed that the severity of these two factors at pre-treatment would reduce the change in body image post-treatment. The first factor was the severity of the ED. It was surprising that this factor had no influence. A possible explanation is that this result is related to the aforementioned assumption that EDs may be the result of a body image disorder [66]. In addition, Alleva, Martijn, Van Breukelen, Jansen and Karos [71] stated that the severity of body image problems is associated with the persistence of EDs.

The second factor was the severity of depressive symptoms. Two separate mediation analyses showed that depressive symptoms mediated the relationship between pre- and post-intervention scores for body attitude (BAT) but not for body satisfaction (BCS). The more severe the depressive symptoms, the smaller the change in body attitude. Body attitude refers

to the cognitive, affective and behavioural attitudes towards the body [72], and body satisfaction refers to the degree of contentment with the appearance or functionality of the body [46]. In line with our results, Van Mierlo, Scheffers and Koning [73] found that body attitude appears to be a somewhat stronger predictor of depressive symptoms than body satisfaction. Other literature also shows that there is a reciprocal relationship between depressive symptoms and negative attitudinal body image. On the one hand, a negative attitudinal body image can be a risk factor for the development of a mood disorder [74], while on the other hand, the body is judged less positively if there is a mood disorder [33].

In this study, depressive symptoms only mediated the results for the BAT; a possible explanation could be the hypothesis that, as a construct, body attitude is more comprehensive than body satisfaction. Before, during and after BE in the PBE protocol, the treatment is aimed not only at encouraging affective appreciation of the body (body satisfaction) but also at challenging dysfunctional thoughts and behaviours related to body image [17]. It could be that a high severity of depressive symptoms at the start of the treatment makes it more difficult to challenge and change these dysfunctional thoughts and behaviours. Griffen et al., [16] reported in their review that, in several studies, dropouts from BE treatment had significantly higher baseline depression scores than other participants; the authors concluded that caution was warranted when treating individuals with a history of self-injurious behaviour or current clinical depression. Our findings confirmed this; we showed that higher severity depression symptoms negatively influenced the outcome of the intervention. We, therefore, advocate for special attention to depressive symptoms when patients are referred to BE; if needed, extra forms of treatment should be offered.

This clinical trial must be interpreted in light of several limitations that should inform future positive BE research. The lack of a control group and follow-up measures implies that the results must be interpreted with caution. Although a strength of this study is the fact that participants did not receive any other treatment for their ED during the period in which positive BE was administered, it is still unclear whether positive BE is a better option, compared to other variants of BE, in a clinical setting. Future studies should therefore implement clinical randomized controlled designs in order to compare different variants of BE or to evaluate positive BE versus other interventions that aim to improve aspects of body image and eating symptomatology. Concerning follow-up measures, Khalsa, Portnoff, McCurdy-McKinnon and Feusner [75] emphasized the importance of these measures in order to analyse the stability of effects as well as relapses in the context of EDs. However, in line with the experiences of Tanck et al., [25] in their clinical research on positive BE, we could



not collect follow-up data due to the fact that participants in an outpatient setting are discharged after treatment. Future research should therefore consider how to implement follow-up measurements, including in an outpatient treatment setting, in order to analyse effect stability.

Another limitation is the generalizability of this study. Since the positive BE took place in an outpatient setting, the potential severity of the eating pathology may differ from what is typical for inpatient treatment. The average ( $M = 3.51$ ,  $SD = 0.89$ ) of the EDE-Q results in the present study for the total sample at pre-test were lower compared to a Dutch clinical inpatient sample ( $n = 935$ ,  $M = 4.02$ ,  $SD = 1.28$ ) [55]. In addition, the mean BMI at pre-test for the AN group in the present study was relatively high ( $M = 20.53$ ,  $SD = 2.57$ ) and probably differed from a clinical inpatient setting. A recommendation for future research is to investigate the positive BE protocol in a group consisting of inpatient participants, while taking into account whether the severity of underweight observed for AN participants influences the effects of positive BE.

All participants received positive BE according to a fixed protocol, i.e., the PBE protocol [17, 34]. An important recommendation by Jansen et al. (2013) is that offering BE according to a structured and detailed protocol is more effective than having patients look at their own bodies in the mirror without a clear purpose. For this reason, it is crucial that BE protocols are available for clinical practice and further research. It may be considered a shortcoming that not all participants in this study received the same number of sessions. However, because no clinical trial has empirically determined the ideal length of BE [16], we decided, as a first step, to explore the question of whether the number of sessions participants received corresponded with the prescribed number of sessions (12–17) in the PBE protocol. The results indicate that the average number of sessions was 14.15 for all participants, of whom 75% received a maximum of 17 sessions.

Finally, it is important to mention that all participants were female, predominantly highly educated and, on average, in their twenties. Although these characteristics are representative for EDs, and the overrepresentation of patients with high levels of education is often observed [76-77], it is unclear whether our findings can be transferred to men and midlife women with an ED, in cases where body image problems are also present. Due to a lower prevalence of EDs, these groups receive little attention [78-79]. Future research should, therefore, investigate the effects of positive BE in men and older women with an ED.

**Conclusions**

The present study made it clear that positive BE, administered with the PBE protocol, leads to significant positive changes in attitudinal body image, eating pathology and depressive symptoms in female participants with EDs (AN, BN and BED) in a clinical setting. Moreover, all difference scores on all outcome measures were clinically relevant. These results indicate that positive BE is a suitable intervention for reducing negative attitudinal body image not only for patients with AN and BN but also for those with BED. Furthermore, results indicate that mitigating weight-related body dissatisfaction by learning to shift the focus to positive non-weight-related and functional body satisfaction is a strong catalyst for change. In contrast, depressive symptoms were found to be a negative mediator: more severe depressive symptoms reduced the change in body attitude. While the results must be interpreted with caution because of a lack of a control group and follow-up measures, this study certainly expands the available knowledge about the effectiveness and effect of positive BE in a clinical setting.

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## **General Discussion**



The aim of this thesis was to extend knowledge related to assessment and treatment of negative body experience in eating disorders (EDs), with an emphasis on the role of body functionality in reducing body dissatisfaction. This concluding chapter starts with recapping and discussing the main findings of the thesis, followed by general reflections on the results and their implications for clinical practice. The reflections are structured by the following questions: Should there be more emphasis on body experience when treating patients with EDs? How to treat negative body experience? How can body functionality appreciation be integrated in the treatment of body experience? What is the role of depressive symptoms in the treatment of body experience? Finally, limitations of the studies presented in this thesis, as well as suggestions for future research and clinical practice will be discussed.

## **MAIN FINDINGS**

### **Assessment of body functionality (Chapters 2 and 3)**

Body functionality relates to the thoughts and feelings of a person about the functioning of his or her own body. Appreciation of body functionality could serve as a potentially useful target for interventions directed at body dissatisfaction and disordered eating (Linardon et al., 2023). In order to contribute to the evaluation of the psychometric properties of questionnaires measuring body functionality, we examined the Dutch version of the Body Cathexis Scale (BCS) and the Functionality Appreciation Scale (FAS) in Chapter 2 and 3 respectively.

The BCS measures the degree of satisfaction with appearance and functionality of different parts of the body. In our analysis of the BCS, using both a community and an ED sample, we found that functional body satisfaction may be regarded as a distinctive factor. Exploratory factor analysis (EFA) identified Functionality as one of the three factors next to two appearance-related factors: a Non-weight and a Weight factor. A three-factor model was confirmed by confirmatory factor analysis (CFA). We concluded that the three factors may be used as subscales given their good internal consistency and the relatively low correlations between the factors. In accordance with our hypothesis, women in the non-clinical sample ( $n = 579$ ) reported significantly greater satisfaction with their bodies than those in the clinical sample ( $n = 238$ ), as reflected by differences in total scores and subscale scores with high effect sizes. The subscale Weight showed the highest effect size ( $d = 1.81$ ), whereas the effect sizes for the subscales Functionality ( $d = 0.91$ ) and Non-weight ( $d = 1.12$ ), though still high, were lower. Given that the subscale Functionality reflected the least relative difference

between women in the non-clinical sample and women with EDs, we concluded that it might be worthwhile to further investigate whether enhancing functional body satisfaction could lead to a generally more positive body experience in female patients with EDs.

In contrast to the BCS, the FAS exclusively measures the construct of body functionality appreciation. Also using a non-clinical ( $n = 669$ ) and clinical sample ( $n = 150$ ) we found that the Dutch version of the FAS is robust in terms of reliability, factor structure, and convergent and discriminant validity. We examined the convergent construct validity of the FAS comparing the scores with the BCS scores, especially those on the subscale Functionality. Discriminant construct validity was established contrasting the FAS with the subscales restraint and eating concern of the Eating Disorder Examination Questionnaire (EDE-Q). The study showed that women with EDs score significantly lower on the FAS than women from a community sample which confirms the results in the BCS study as presented above. FAS scores in the female ED sample were negatively correlated with the subscales eating restraint and eating concern of the EDE-Q. These outcomes differ from those in the study by Alleva et al. (2017) in a U.S. online community sample of women and men, where no correlations between disordered eating and FAS scores were found. The negative correlations in our study indicate that lower scores of body functionality appreciation are associated with higher scores of disordered eating behaviour in a female ED sample. These findings could have important clinical relevance because they suggest that higher body functionality appreciation is associated with reduced symptoms of disordered eating behaviour. These findings could have important clinical relevance in that improving body functionality may help to reduce disordered eating behaviour. Something that was also suggested by Linardon et al. (2023), who found in their review emerging evidence that functionality appreciation may protect against ED symptoms and promote adaptive eating patterns

Although in both the female ED sample and the female community sample strong positive correlations were found between the FAS and the total BCS-scores, the correlations between the subscale Functionality of the BCS and the FAS scores were less strong than we expected in both samples. This is an interesting finding, leading to the conclusion that the FAS and the subscale Functionality of the BCS probably do not measure the same construct of functionality appreciation. An explanation for this relatively weak correlation could be that the FAS items contain more terms other than appreciation like grateful, acknowledge, respect to characterize functionality appreciation, whereas the BCS items merely ask for the level of satisfaction as an indicator for functionality appreciation. To be grateful for, to acknowledge

or to respect the functionality of the own body might not be the same thing as to be satisfied with the functionality of the own body. Another explanation is the different focus of the two questionnaires. The BCS focuses on satisfaction with specific body parts and processes, while the FAS refers to the functioning of the body as a whole.

In this context it may be useful to reflect on the term ‘body’ in a questionnaire. Clinical observations seem to show that, when ED patients speak or think about their body, they often only connect with the middle part of their body, such as belly, waist, hips and upper legs; parts they often disgust and objectify. Studies examining gaze patterns towards one’s own body confirm these clinical observations. These studies suggest that female patients with EDs and body dissatisfied women have an attentional bias for self-defined unattractive body areas in the middle part of their body, while healthy participants have a more balanced scanning behaviour (Bauer et al., 2017; Janelle et al., 2009; Jansen et al., 2005; Porrás-García et al., 2019; Tuschen-Caffier et al., 2015). Thus, for ED patients, the term body in the FAS-items could unintentionally confirm this particular focus. Questions about the level of body satisfaction of a wide variety of body parts or body processes, as requested in the BCS, could create a different view of functional appreciation. In order to obtain a broader picture of functional body experience for clinical practice and research, we suggest to use both the BCS and the FAS. However, more research is needed to examine the benefits for diagnostics and treatment evaluation when using both questionnaires.

In conclusion, the studies in Chapter 2 and 3 show that the Dutch versions of the BCS and the FAS are valid, reliable and valuable questionnaires to measure body functionality in people with EDs. A few additional comments regarding the design and analyses of the studies presented are necessary. For an accurate comparison between scores on BCS and FAS in women with and women without EDs, more insight is needed into the invariance of the factor structure of the questionnaires where these two groups are concerned. We refrained from evaluating invariance since our clinical samples were not large enough. Another limitation of both studies is that we did not examine sensitivity to change, which is a central and primary psychometric property when questionnaires are intended to measure patient change following a course of an intervention (Vermeersch et al., 2000). We therefore recommend additional longitudinal psychometric research with the BCS and the FAS.

## **Treatment of negative body experience; positive body exposure, extended with functional appreciation (Chapter 4)**

Body exposure is a widely used approach in the treatment of negative body experience in EDs. (Most of the studies on body exposure have been conducted in body-dissatisfied women in non-clinical samples (Griffen et al., 2018), except for a single study in women with BN (Díaz-Ferrer et al., 2015). Klimek et al. (2020) highlight this gap in body exposure studies and advocate for clinical trials. In the same vein, Tanck et al. (2021) conclude that evidence on the effectiveness of different forms of body exposure in clinical populations is necessary to guarantee more accurate interventions and better treatment results in the future. To design and perform adequate trials, we need treatment protocols of the various variants of body exposure.

Following this line of reasoning, the protocol Positive Body Experience (PBE), a body-oriented treatment protocol with a focus on positive body exposure, was developed and presented in Chapter 4. The theoretical base for such a protocol is provided by Jansen et al. (2005) and Tuschen-Caffier et al. (2015). Although exposure procedures and instructions are described briefly in studies on positive body exposure (Glashouwer et al., 2016; Tanck et al., 2022), we concluded that a more elaborate protocol needs to become available, as this creates a foundation for further critical analysis and research. To fill this gap, we designed a protocol based on techniques from cognitive-behaviour therapy and body-oriented psychotherapy, with self-confrontation with the help of help of a mirror and hetero confrontation, using comparison exercises as key elements of the positive exposure. (inspired by the research of Jansen et al., 2005 and Leahey et al., 2011).

The positive body exposure in the protocol PBE is not limited exclusively to aesthetic aspects, but also highlights positive functional aspects of the positively experienced body parts. We substantiated this approach with studies that show that positive functional feelings and thoughts about one's own body or body parts can serve as an important ingredient of body satisfaction (Alleva et al., 2019; Alleva et al., 2014; Frisén & Holmqvist, 2010; Wood-Barcalow et al., 2010). To our knowledge, this is the first time that body functionality-focused exposure is described and integrated in a treatment protocol to enhance body satisfaction in EDs.

## **Evaluation of a positive body exposure protocol for the treatment of negative body experience in patients with EDs (Chapter 5)**

In Chapter 5 we present a pilot pre-post study that evaluated the outcomes of positive body exposure with regard to changes in negative body experience and eating pathology and factors that influence these changes. The sample consisted of 84 adult female patients with different EDs (AN, BN and BED) who did not receive any other treatment for the ED during the intervention. Significant positive changes in body experience, eating pathology and depressive symptoms were found. Changes on all outcome measures were clinically relevant as all average difference scores exceeded the minimal clinically important change (MCID) threshold.

Contrary to expectations we found that scores on the BCS Functionality scale but also on the BCS-Weight subscale scores were significantly higher at the end of treatment. We did not expect this since participants were instructed to focus exclusively on positively experienced body parts and to refrain from looking at or speaking about negatively experienced body parts, which are often weight-related body parts. A possible explanation for the increase in satisfaction for weight-related body parts could be that when positively experienced body parts are more prominent, the focus on negatively experienced weight-related body parts may shift to the background, which could result in less weight-related body dissatisfaction. In addition to evaluating changes in negative body satisfaction and eating pathology, we examined factors that possibly influence these changes.

We assumed that the severity of the ED pre-treatment would negatively mediate the extent of the change in body image found post-treatment. To our surprise this was not the case. Furthermore, we assumed that the severity of the depressive symptoms pre-treatment would negatively mediate the extent of the change in body image found post-treatment. This was the case: we did indeed find the level of depressive symptoms to be a negative mediator. In other words, depressive symptoms at the start of treatment hindered positive changes in body satisfaction in our participants. These results are somewhat supported by studies on cross sectional data by Van Mierlo et al. (2021) and Rawana et al. (2010) that show an interrelationship between negative body experience and depressive symptoms.

Results must be interpreted with caution. A single-arm pretest/post-test design was used, so changes could not be contrasted with a control group without an intervention or with, for instance, a negative exposure protocol. Furthermore, our clinical trial lacks follow-up measures, so we do not know whether changes were maintained in the long run. A further

limitation of the study was that only limited data are available of patients who did not complete questionnaires at the end of treatment. Number and background of these patients are described but no dropout analyses were performed. This limits definitive conclusions on the generalizability of the results of the protocol PBE.

## **GENERAL REFLECTIONS ON RESULTS AND THEIR MEANING IN A CLINICAL CONTEXT**

### **Should there be more emphasis on body experience when treating patients with EDs?**

Despite the extensive experimental and theoretical attention for body experience in EDs in academic research (e.g. Cash & Brown, 1987; Lewer et al., 2017; McLean & Paxton, 2019; Murnen et al., 2019; Walker et al., 2018), the role of body experience in the treatment of EDs itself has not received similar systematic attention (Jarry & Cash, 2011). In the Dutch Standard of Care (Akwa GGZ, 2017) body experience is listed as one of the main features of treatment. However, in the remainder of the document, interventions aimed at body experience only appear in a section on ‘Additional treatment options’. In this section psychomotor therapy is mentioned as an approach to help patients deal with negative body experience, emphasizing the use of protocolled body exposure.

The National Institute for Health and Care Excellence (NICE) guideline formulated in the UK (2020) and the most recent American Psychiatric Association (APA) Practice Guideline for the Treatment of Patients with Eating Disorders (Crone et al., 2023) both do not mention treatments that directly target negative and/or disturbed body experience in AN and BN. Only in the case of BED, the NICE guideline (2020) describes that group eating-disorder-focussed cognitive behavioural therapy (CBT-ED) programmes should include body exposure training and support patients to identify and change negative beliefs about the body. Looking closer at both guidelines, the APA Practice Guideline (Crone et al., 2023) mentions body image concerns in AN as a possible target for psychological interventions. In the NICE guideline (2020) body image concerns are presented in the description of CBT-ED for AN and BN as a topic that could be addressed.

It is interesting to consider possible reasons why the treatment of negative body experience is largely absent or ascribed only secondary importance in the different guidelines. Ferrer-Garcia and Gutierrez-Maldonado (2012) note that body experience is a difficult construct to define and that it is highly resistant to reasoning-based interventions. The use of

different labels for the same construct (Askew et al., 2020; Glashouwer et al., 2019) and the different interpretations of the construct (Prnjak et al., 2022) are an obstacle for further research.

Also, Stinson (2019) signals that negative and disturbed body experience is largely overlooked in regular treatment and argues that this could possibly explain why treatment results for EDs may be so poor. In this light, the results of the study by Chapa et al. (2020) are interesting. They followed a large sample of patients with ED over the course of the first three months of regular treatment and found that in AN and BN, eating disorder behaviours and cognitions decreased significantly and were within one SD of nonclinical norms as measured by the Eating Pathology Symptoms Inventory (EPSI; Forbush et al., 2013). Body dissatisfaction, however, remained in the clinical range. Chapa et al. (2020) suggest that body dissatisfaction is difficult to change and not always meaningfully resolved at the end of most time-limited treatments. They conclude that if ED clinicians and researchers are aware which ED symptoms are slow to change, treatment protocols could be adjusted to improve ED treatment outcomes. Of course, the outcomes of the study by Chapa et al. (2020) must be critically examined. The participants ( $n = 4568$ ) of this study were Recovery Record (RR; Tregarthen, et al., 2015) users following regular treatment for an ED, who had their RR profile linked with their clinician. Chapa et al. (2020) examined only self-reported data of these participants in the mobile phone application RR and did not collect any information about start and type of treatment and level of care. On the other hand, this study coincides with previous studies where body dissatisfaction was found to be one of the most consistent risk and maintenance factors for ED (Stice, 2002) and an independent predictor of disordered eating (Levine & Piran, 2004).

Recently, Glashouwer et al. (2019) systematically reviewed the role of body experience in the onset, maintenance and relapse of AN. Although they found some evidence suggesting that a negative or disturbed body experience is associated with the treatment course of AN, they could not conclusively answer the question whether a negative or disturbed body experience is a causal risk factor for AN and whether treatment of body experience is crucial for successful recovery. The authors gave two reasons for this inconclusiveness: A lack of research and, as also stated above, the variations in the outcomes related to how patients evaluate and experience their body. They conclude that “when individuals are heavily burdened by their negative body image, this can of course be an important reason for using interventions that are designed to address body image disturbances” (p. 17).

Results of the evaluation of the PBE protocol showed significant positive changes in negative body experience and eating pathology. A noteworthy finding was that significant positive changes were found on all EDE-Q subscales, including the subscales for restraint and eating concern which are related to eating behaviour. These results are in line with a review by Jarry and Berardi (2004) on the effectiveness of stand-alone body experience treatments. They concluded that “the interventions were highly effective in improving body image and psychological variables and, to a lesser extent, eating attitude and behaviour” (p. 319). Along these lines, we found that the extent of change in body experience found post-treatment seemed to be independent of the severity of the ED before the start of treatment.

The above results suggest intriguing avenues to explore, especially concerning the possibilities of treating EDs with interventions focusing on body experience. Some authors even suggest that EDs could possibly best be defined as a body experience disorder. Stinson (2019) observes: “Not eating may be a readily observable sign of the disorder, but what is most obvious to observers is not always the best focus of treatment” (p. 7). Phillipou et al. (2018) suggest that the conceptualization of AN and BN as EDs might be too simplistic and misleading. They argue for another classification system, classifying AN and BN not as EDs but as body experience disorders. Such a change in classification and terminology would, according to the authors, result in more emphasis being placed on body experience problems, leading to fewer misperceptions and comments focused on eating behaviour, along with a change in the research agenda concerning EDs. A new classification may be superfluous, but there is no doubt that it is important to more systematically explore the relevance of body experience in (the treatment of) EDs.

Another interesting issue for further research is the fact that the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5- TR; American Psychiatric Association (APA), 2022) does not contain a body experience related criterion for BED. In their reviews, both Ahrberg et al. (2011) and Lewer et al. (2017) found that negative body experience also occurs in BED. Prnjak et al. (2022) observe that the diagnosis of BED does not require any body experience problems to be present, despite consistent evidence of their importance in previous studies (Grilo, 2013; Mitchison et al., 2018; Yiu et al., 2017; Wang et al., 2019). Based on research from a large national sample of U.S. adults, Coffino et al. (2019) conclude that the presence of body experience problems found in BED “warrants consideration as a diagnostic specifier in future editions of the DSM” (p. 1370).

Our clinical study in Chapter 5 revealed that body dissatisfaction scores of the participants with BED were not different from those of the AN and BN participants. These



results are in line with Barry et al. (2003), who found that the levels of body dissatisfaction did not differ between patients with BED and patients with BN. Recently, Krohmer et al. (2022) found a more negative self-focused and deficit-oriented bias towards the own body in the female BED group compared with overweight and healthy weight female control groups. All in all, we would like to make a plea for more attention for negative and/or disturbed body experience in all EDs both in the diagnostic phase and in treatment. Ideally, this would lead to the addition of treatment of body experience problems in ED guidelines.

### **How to treat negative body experience?**

Despite many inspiring ideas brought forward in the last decades there is still a shortage of knowledge on how to treat negative body experience. In general, cognitive behavioural therapy for body image disturbances (CBT-BI) aims at modifying dysfunctional thoughts, emotions and behaviour through psychoeducation, self-monitoring and cognitive restructuring (for a recent description of this intervention see Pullmer et al., 2023). Body exposure exercises can also be part of CBT-BI (Alleva et al., 2015), but until now these types of exercises are not included in CBT treatment manuals for ED (Walker & Murray, 2022). Other methods directed at negative body experience are writing exercises (Mulgrew et al., 2017), media literacy interventions (Grabe et al., 2008) and the use of virtual reality (VR) environments (Clus et al., 2018; Ferrer-García & Gutierrez-Maldonado, 2012). In their review of 2004, Jarry and Berardi already suggested that emotionally and experientially focused body experience therapies might be beneficial and effective in the treatment of EDs, but that these interventions remain largely untested. In the last decade body exposure has received increasing attention (Alleva et al., 2015; Griffen et al., 2018; Hartmann et al., 2021). However, the various forms of body exposure that have such an experience-based and emotion focused approach, are not yet supported by clinical research and treatment protocols are lacking.

In this thesis we tried to make a first step to improve this situation by developing a body-oriented treatment protocol that integrates knowledge on what works in the different variations of body exposure. The protocol presented here focuses on positive body exposure, which is not limited to aesthetic aspects, but also takes functional aspects of body parts into account. We still do not fully understand why and how positive exposure works. In search of an answer, it is important to note that putting the focus on positively experienced body parts may be considered as a dissonance-based approach. When individuals engage in behaviour that is inconsistent with their comfort zone, they experience psychological discomfort that

causes them to align their attitudes with their behaviour (Stice et al., 2019). For this reason, Luethcke et al. (2011) called body exposure with the focus on positive experienced body parts ‘cognitive dissonance-based’ exposure instead of positive body exposure.

Stice et al. (2008) examined dissonance-based ED prevention programs focused on healthy body experience in female students with body dissatisfaction and found that these programs produced a significant reduction in eating disorder symptoms. The effects were larger for interventions with more dissonance-inducing activities. Although subsequent studies have documented the effectiveness of dissonance-based prevention programs (Kurz et al., 2022; Stice et al., 2019), the specific contribution of this approach to the effect of body exposure remains to be determined (Luethcke et al., 2011). It would be worthwhile to investigate in future research whether the focus on positive and functional body experience indeed induces cognitive dissonance.

In conclusion, trying to answer the question: *How to treat negative body experience* two ingredients seem to be important. Firstly, the emotional and experiential focus and secondly the dissonance-based approach, which has been shown to be effective in prevention programs in the field of EDs.

### **How to integrate body functionality appreciation in the treatment of body experience?**

To investigate the usefulness, acceptability and/or efficacy of treatments that integrate body functionality we need validated questionnaires. Scores on questionnaires such as the FAS and the BCS can help clinicians to discuss this functional dimension of body experience with their patients alongside the aesthetic dimension. The awareness of and insight in body functionality can possibly also help to motivate individuals with an ED to shift their focus. What more can be said when looking at recent research? Walker & Murray (2022) developed an exclusively functionality-focused body exposure (FBE) based on cognitive dissonance-based approaches. They evaluated their approach by means of a pilot clinical case study with four participants, who demonstrated clinically meaningful, but not significant improvements in body satisfaction from pretreatment to posttreatment. It is too early to draw conclusions from this study because of its limitations. It was conducted as an uncontrolled clinical case series, with only four respondents and the questionnaires for functional and body appreciation were not administered at all time points.

Tanck et al. (2022) examined the effect of three sessions of positive body exposure with 47 ED patients in a clinical setting, using an uncontrolled research design, without follow-up measures. They found that positive body exposure seems to be effective, because it

significantly reduced eating pathology and body dissatisfaction in patients with AN and BN. The primary focus was on positive aesthetic aspects, but if patients had difficulties finding and verbalising positive aesthetic aspects, they were instructed to say something about the functionality of the body parts. Unfortunately, this study provides no information about how often the functional perspective was used during the body exposure.

In conclusion, clinical research on body functionality is still in its early stages, especially concerning its methodology. It is clear that more sophisticated research designs are necessary for the investigation of the usefulness, acceptability and/or efficacy of body exposure interventions with a focus on aesthetic and on functional aspects of the body.

### **What is the role of depressive symptoms in the treatment of body experience?**

To identify factors that influence an effective treatment of body experience, we examined whether the severity of depressive symptoms before treatment mediated change in body experience post-treatment (Chapter 5). Results of our study suggests that women with more severe depressive symptoms at the start of body experience treatment, show less positive change in body experience. A comparable relationship between EDs and depression can be found in the review done by Griffen et al. (2018), who reported that several studies demonstrate that dropouts from body experience treatment had significantly higher baseline depression scores than other participants. Furthermore, Keshishian et al. (2019) found that improvements in ED psychopathology are associated with an absence of major depressive disorder. In this light it should be noted that there is evidence for a reciprocal relationship between depressive symptoms and negative body experience. On the one hand, the body is judged less positively in case of a mood disorder (Rawana et al., 2010). On the other hand, negative body experience can be a risk factor for the development of a mood disorder (Murray et al., 2018).

In our pre-post study depressive symptoms did mediate less successful outcome, and there was also an indication of a possible direct influence of the protocol since the mean level of depressive symptoms was significantly reduced after treatment. The same pattern is reported in the review of Jarry and Berardi (2004), who found body image treatments to be highly effective in improving general psychological variables such as depression and self-esteem. The caveat of this review is that the studies included mostly used community samples. Our study is possibly the first to show that treatment of body experience may bring about an improvement of the depression in an ED sample. We found that the severity of depression at the start negatively influences the outcome of the treatment of EDs. Taking into

account the limitations of our study, we suggest replication studies should be conducted with stronger designs. If results are replicated, we would like to call for a regular assessment and, if necessary, pharmacological management of depressive symptoms in the treatment of negative body experience in people with EDs.

## **LIMITATIONS AND FUTURE DIRECTIONS**

The limitations of the different studies are discussed in the separate chapters and have also been mentioned in this last chapter when reflecting on the results. In this concluding paragraph we will pay some more attention to the limitations in our research due to the choice of the samples used in the psychometric studies and the pilot study. In addition, we will elaborate on the design of the clinical pilot study.

A limitation of all our studies is that we had to restrict our samples to female participants, because only a very small minority of the participants in the ED samples were men. For this reason, we decided to eliminate all men out of the analyses. It is therefore unclear whether our findings can be applied to men with an ED. Due to lower prevalence of EDs in men and to fewer men seeking treatment, this group has received little attention (Weltzin et al., 2012). Preliminary research suggests that negative body experiences manifest themselves differently in men and women. While thinness-oriented body dissatisfaction seems to be more pronounced in women, muscularity-oriented body dissatisfaction tends to be higher in men (Arkenau et al., 2022). Given the findings of Wei et al. (2021) that attitudinal body experience is uniquely associated with both disordered eating and muscle-building behaviour among college men, it would be interesting to examine whether body functionality of men with ED differs from women with ED. And subsequently, how body exposure focused both on positive aesthetic and functional aspects of the body works for men with EDs.

Similar problems concerning the generalizability of our samples apply to age. The female ED samples we used consisted on average of women in their late twenties. Jankowski et al. (2016) did a qualitative community study on ageing and body experience among older adults (65-92 years). They found that in older adults the over-evaluation of shape and weight may lead to a negative body experience, but at the same time, over the years body functionality starts to play a more prominent role. This could imply that, over time, functional body experience becomes more important than aesthetic body experience. Given the fact that older age groups have largely been ignored in studies on body experience (Liechly, 2012),

future studies should investigate the psychometric properties of the BCS and the FAS and the effects of positive body exposure including functionality-focused exposure in older adults, especially in older adults with EDs.

The next limitation that we want to discuss concerns the research design of the pilot study. Although we included a large group of people with different EDs and the participants did not receive any other treatment for their ED than the intervention described in the protocol PBE, no clear conclusion can be drawn as to the effect of the protocol since we did not perform a Randomized Control Trial (RCT). The lack of a control group and follow-up measures in our clinical study imply that the results must be interpreted with caution. It is difficult to present conclusive scientific evidence that positive body exposure is effective, but it also remains unclear whether positive body exposure is a better option, compared to other variants of body exposure in a clinical ED setting. Future studies should therefore use clinical RCTs in order to investigate different variants of body exposure.

One could argue that the problem is that RCTs are not always feasible or only to be executed with considerable compromises in terms of applicability in a clinical setting. Although no general consensus has been established as to the rigor and validity of the evidence derived from studies with an alternative design, more and more pleas can be heard for these alternative designs. This is also related to efforts to overcome the flaws of the classical RCT like the emphasis on statistical significance over clinical and societal relevance and the neglect of individual and contextual differences (Samenleving RVVE, 2017). Alternative designs could be single case or cohort studies.

De Young and Bottera (2018) argue that single-case experimental designs (SCEDs) are particularly well suited to clinical settings and describe how to use SCEDs in the ED field. (Multiple) SCEDs can be designed so that the subject is her of his own control by adding an extended baseline of randomised length and follow-up period: collecting uniformly across all patients, using ABA designs with randomized series of A (no body exposure) and B (body exposure), as is recommended by Kadzin (2019).

In a cohort study only one group is used. In such a design a group of participants sharing some characteristics, are repeatedly measured for an extended period to assess the occurrence of the outcomes (Dekkers et al., 2012). Cohort studies often have broader inclusion and fewer exclusion criteria compared with RCTs and do not alter treatment regimen to evaluate the efficacy of an intervention as one does in an RCT (Horn et al., 2005). For these reasons, results from cohort studies may be more generalizable in clinical practice (Wang & Kattan, 2020). As for now there have been a few clinical studies directed at the

effect of treatment in ED that have applied these alternative designs. Examples of these studies are: Abrahamsson et al. (2018), Isaksson et al. (2021) and Napel-Schultz et al. (2022), who used SCEDs and a study by Lebow et al., (2021), who used a cohort design.

A final limitation concerns the fact that in our study the positive body exposure intervention took place in an outpatient setting. Given the fact that in the Netherlands only people with very severe EDs are treated in an inpatient setting, the severity of the eating pathology in our sample may differ from that in other samples, especially if these only include patients in inpatient settings. For this reason, it would be of added value to investigate the effect of positive body exposure also in samples consisting of inpatient participants with lower BMI's.

## **CONCLUDING REMARKS**

This thesis highlights the importance of body experience problems in EDs. A crucial theme in the light of a substantial proportion of young people reporting an ED and a challenge to find solutions and interventions that may help to solve these problems. We argue that negative and/or disturbed body experience may be a core problem in EDs. This makes an effective treatment of body experience problems an essential element of the treatment of EDs. We have underlined the importance of positive body exposure that contains and integrates both positive aesthetic and functional body experience and made a first step towards description and evaluation of such a protocol.

Eating disorders form a world-wide challenge. Solutions and interventions can only be developed by fruitfully and consistently integrating the results of clinical practice into academic research and vice versa. We hope that this thesis has contributed to that endeavour and will help to implement necessary changes in the research agenda concerning body experience in EDs.

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## Nederlandse samenvatting

Dit proefschrift richt zich op de negatieve lichaamsbeleving bij eetstoornissen. Het doel is een bijdrage te leveren aan het verbeteren en vergroten van de kennis ten aanzien van zowel de diagnostiek als de behandeling van deze negatieve lichaamsbeleving. Daarbij zal de nadruk liggen op de rol die de functionele lichaamsbeleving hierin kan spelen. Een negatieve en/of verstoorde lichaamsbeleving van mensen met eetstoornissen wordt beschouwd als één van de kernsymptomen van een eetstoornis. De term negatieve lichaamsbeleving verwijst naar de houding (gedachten en gevoelens) ten opzichte van het eigen lichaam. Er wordt gesproken van een verstoorde lichaamsbeleving als er sprake is van een verstoorde perceptie van de eigen lichaamsomvang. In dit proefschrift ligt de focus op de negatieve lichaamsbeleving.

In de afgelopen decennia is er veel onderzoek gedaan naar het toepassen van lichaamsexposure om de negatieve lichaamsbeleving van mensen met eetstoornissen ten positieve te veranderen. In het overgrote deel van de studies over het effect van lichaamsexposure wordt echter geen gebruik gemaakt van de resultaten van klinisch onderzoek. In dit proefschrift is juist het accent gelegd op onderzoek waarbij ook mensen die in behandeling zijn voor een eetstoornis worden meegenomen. Een ander hiaat in het onderzoek naar de behandeling van de negatieve lichaamsbeleving is de afwezigheid van behandelprotocollen op het gebied van lichaamsexposure. Het door ons ontwikkelde protocol Positieve Lichaamsbeleving (Positive Body Exposure; PBE), dat gepresenteerd wordt in hoofdstuk 4, is gebaseerd op positieve lichaamsexposure. Deze lichaamsexposure is niet alleen gericht op de positieve esthetische, maar ook op de positieve functionele waardering van het lichaam.

Het proefschrift is opgebouwd rond vier studies. Na een theoretische inleiding waarin de “State of the art” ten aanzien van eetstoornissen wordt besproken en de doelen van het proefschrift worden toegelicht, evalueren we in hoofdstuk 2 de psychometrische kenmerken van de Nederlandse versie van de Body Cathexis Scale (BCS). Deze zelfrapportage vragenlijst van 40 items meet zowel de waardering ten aanzien van lichaamsdelen als ten aanzien van lichaamsfuncties. Hierbij werd gebruik gemaakt van klinische onderzoeksgroepen met daarin vrouwen met een eetstoornis en niet-klinische vrouwelijke onderzoeksgroepen. Uit de exploratieve factoranalyses (EFA) bleek dat “Functionele lichaamswaardering” als één van de drie factoren kan worden onderscheiden naast de twee

factoren “Niet-gewicht gerelateerde” en “Gewicht gerelateerde lichaamswaardering”. Deze resultaten werden bevestigd door de confirmatieve factoranalyses (CFA). Onze conclusie is dat deze drie factoren, gezien hun goede interne consistentie en de relatief lage correlaties tussen de factoren, beschouwd kunnen worden als drie subschalen. Verdere vonden we dat de vrouwen uit de niet-klinische onderzoeksgroep vergeleken met de vrouwen uit de klinische onderzoeksgroep een significant positievere lichaamswaardering rapporteerden voor de totale score en subschaalscores van de BCS met hoge effectgroottes. Opvallend was dat de effectgrootte voor de subschaal “Functionele waardering”, hoewel nog steeds hoog, het laagste was, dus relatief gezien het minste verschil tussen de twee onderzoeksgroepen liet zien. Op basis hiervan concluderen we dat het waardevol kan zijn om verder te onderzoeken of het versterken van de positieve functionele waardering zou kunnen leiden tot een positievere lichaamsbeleving van vrouwen met een eetstoornis.

In hoofdstuk 3 volgt een soortgelijke aanpak van de Nederlandse versie van de Functionality Appreciation Scale (FAS), waarbij ook klinische en niet-klinische vrouwelijke onderzoeksgroepen werden gebruikt. De FAS is een vragenlijst met zeven items die de functionele lichaamswaardering meet. Naast factoranalyse (EFA en CFA), die een 1-factor model bevestigde, zoals ook in voorgaande onderzoeken naar de FAS naar voren is gekomen, werd ook gekeken naar convergente en discriminante constructvaliditeit en naar betrouwbaarheid. De resultaten laten zien dat de Nederlandse versie van de FAS een solide betrouwbaarheid en validiteit heeft. Verder vonden we dat de FAS-scores van de eetstoornis onderzoeksgroep significant lager waren vergeleken met de niet-klinische onderzoeksgroep en tevens negatief correleerden met de twee subschalen van de Eating Disorder Examination Questionnaire (EDE-Q) die verstoord eetgedrag meten. Aangezien deze laatste bevinding aangaf dat een lagere functionele lichaamswaardering geassocieerd is aan meer verstoord eetgedrag, suggereert het onderzoek dat een positievere functionele lichaamswaardering symptomen van verstoord eetgedrag zou kunnen verminderen. Hoewel er sprake was van een sterke positieve correlatie tussen de totaalscore van de BCS en de FAS, bleek tegen de verwachting in de subschaal Functionele waardering van de BCS geen hogere correlatie te hebben met de FAS dan de andere twee subschalen, die meer uiterlijk gerelateerd zijn. Dit leidde tot de conclusie dat mogelijk de subschaal Functionele waardering van de BCS en de FAS gedeeltelijk verschillende constructen meten van functionele lichaamswaardering.

In hoofdstuk 4 wordt een lichaams-georiënteerd behandelingsprotocol (protocol *Positive Body Experience*; PBE) gepresenteerd, met de focus op positieve lichaamsexposure. Na het beschrijven van de wetenschappelijk discussie die ten grondslag ligt aan het protocol

PBE is mede aan de hand van casuïstiek een beschrijving gegeven van de opbouw en inhoud van het protocol. In de beschrijving wordt ook aangegeven op wat voor manier het protocol vernieuwend is ten opzichte van eerdere exposure protocollen: de lichaamsexposure is niet alleen gericht is op de positieve esthetische maar ook op de positieve functionele beleving van het eigen lichaam.

Voor hoofdstuk 5 onderzochten we de klinische toepassing van het protocol PBE. In een pilotstudie werden de resultaten van de positieve lichaamsexposure geëvalueerd. De onderzoeksgroep bestond uit 84 volwassen vrouwelijke patiënten met verschillende eetstoornissen, die geen andere behandeling volgden voor hun eetstoornis gedurende de behandeling met het protocol PBE. Het onderzoek liet zien dat er na de interventie met het protocol PBE sprake was van significant positieve veranderingen in lichaamsbeleving, eetpathologie en depressieve symptomen. Elk van deze veranderingen was klinisch relevant: alle verschillcores waren hoger dan de drempel voor een minimaal klinisch relevant verschil (minimal clinically important change; MCID). Het is opvallend dat de interventie met het protocol PBE ook resulteerde in significant positiever scores op de BCS-subschaal “Gewicht gerelateerd”, iets waar de positieve exposure juist niet op was gericht. De focus op positief ervaren lichaamsdelen en lichaamsfuncties bewerkstelligt mogelijk tevens een positieve verandering ten aanzien van negatief ervaren gewicht gerelateerde lichaamsdelen. Tot onze verrassing bleek de ernst van de eetstoornis niet geassocieerd met de mate van verandering van lichaamsbeleving. Daarentegen bleek de ernst van de depressieve symptomen dat wel.

In het laatste hoofdstuk hebben we eerst de belangrijkste bevindingen van dit proefschrift gerapporteerd aan de hand van de volgende vragen: Moet er meer nadruk liggen op lichaamsbeleving in de behandeling van patiënten met eetstoornissen? Hoe moeten we de negatieve lichaamsbeleving behandelen? Hoe kunnen we functionele lichaamsbeleving integreren in de behandeling van de lichaamsbeleving? En, wat is de rol van depressieve symptomen in de behandeling van de lichaamsbeleving bij eetstoornissen?

Met betrekking tot de eerste vraag constateren we dat, ondanks veel experimenteel en theoretisch onderzoek naar lichaamsbeleving bij eetstoornissen, de rol van lichaamsbeleving in de behandeling van eetstoornissen geen evenredige aandacht krijgt. We reflecteren over mogelijke redenen, waarom in de diverse richtlijnen de behandeling van lichaamsbeleving grotendeels afwezig is of als van secundair belang wordt beschreven. Dit heeft mogelijk te maken met de verschillende definities van het construct lichaamsbeleving, dat een negatieve en/of verstoorde lichaamsbeleving misschien niet (h)erkend wordt als doel in een reguliere behandeling en wellicht ook met het feit dat een negatieve en/of verstoorde lichaamsbeleving

niet eenvoudig te veranderen is. Sommige auteurs gaan zo ver dat ze suggereren dat lichaamsbeleving beter beschouwd kan worden als de essentie van de eetstoornis, in plaats van een symptoom. Deze veronderstelling zou kunnen leiden tot een andere classificatie van eetstoornissen in de vorm van lichaamsbelevingsstoornissen, wat meer aandacht kan genereren in de behandeling voor de lichaamsbelevingsproblematiek en een accentverschuiving kan teweegbrengen in de onderzoek agenda. We concluderen dat een nieuw classificatiesysteem mogelijk overbodig is, maar dat het belangrijk is om het belang van lichaamsbeleving in de behandeling van eetstoornissen systematischer te onderzoeken.

De tweede vraag betrof de vraag hoe we de lichaamsbeleving moeten behandelen. Deze vraag is niet zo simpel te beantwoorden. Hoewel lichaamsexposure vooralsnog de meest gehanteerde therapievorm blijkt te zijn, wordt dit nog onvoldoende ondersteund door klinisch onderzoek of behandelingsprotocollen. In dit proefschrift is een eerste poging gedaan om deze situatie te verbeteren door eerst in hoofdstuk 1 de verschillende vormen van body exposure te analyseren en vervolgens in hoofdstuk 4 een nieuw protocol te presenteren dat in hoofdstuk 5 voor het eerst klinisch is geëvalueerd. Voor een antwoord op de vraag naar het werkingsmechanisme achter het protocol kunnen we niet terugvallen op empirische data. We suggereren dat een behandeling met het protocol PBE mogelijk goed werkt omdat de lichaamsexposure appelleert aan een op dissonantie gebaseerde benadering. Bij een dergelijke benadering worden mensen gestimuleerd om ander gedrag te proberen dan zij gewoon zijn en waar zij zich 'comfortabel' bij voelen. Het psychologische onbehagen dat dit kan oproepen, zou een belangrijke stimulans kunnen zijn voor blijvende gedragsverandering. Niet alleen de focus op positief gewaardeerde lichaamsdelen, maar ook de focus op de functionele lichaamsbeleving kunnen in dit licht gezien worden als dissonante interventies, wat maakt dat beide zouden kunnen fungeren als katalysatoren voor het induceren van positievere lichaamsbeleving.

De derde vraag betrof de integratie van functionele lichaamsbeleving in de behandeling van de negatieve lichaamsbeleving. Gezien de dominante esthetische focus op het eigen lichaam van mensen met eetstoornissen, is het zeker belangrijk om hier in de klinische praktijk op aan te sluiten. Daarnaast kan het waardevol zijn om deze aanpak aan te vullen met een, voor mensen met eetstoornissen vaak nieuwe, focus op het functioneren van het lichaam. Onderzoek op dit gebied staat nog in de kinderschoenen. Meer onderzoek is nodig om de bruikbaarheid, werking en effect van interventies met betrekking tot lichaamsexposure, die zowel de esthetische als de functionele focus combineren, in kaart te brengen.

Als laatste hebben we stil gestaan bij de vraag wat de rol is van depressieve symptomen in de behandeling van de lichaamsbeleving bij eetstoornissen. Zoals eerder vermeld, suggereert onze evaluatiestudie dat er een klinisch relevante relatie is tussen depressieve symptomen en (verandering in) lichaamsbeleving. Hoewel de gevonden relatie tussen depressieve klachten en lichaamsbeleving ook uit eerder onderzoek is gebleken, is dit de eerste studie waarbij dit ook in een klinisch eetstoornis sample is aangetoond. In de studie bleek dat de behandeling van de negatieve lichaamsbeleving niet alleen een positief effect heeft op de stemming, maar ook dat de ernst van de stemmingsklachten bij aanvang van de behandeling negatief geassocieerd is met de uitkomsten van de behandeling van de lichaamsbeleving. Als replicatiestudies tot dezelfde resultaten komen, kan een aanbeveling gedaan worden voor een standaard assessment van de depressieve symptomen voorafgaande aan en indien nodig gedurende de behandeling van de negatieve lichaamsbeleving bij eetstoornissen.

In dit proefschrift staan de diagnostiek en behandeling van de lichaamsbeleving bij eetstoornissen centraal. Aangezien eetstoornissen een wereldwijde uitdaging vormen - en zeker ook omdat het vooral jonge mensen betreft - is het cruciaal om oplossingen te vinden en interventies te ontwikkelen waarmee eetstoornissen succesvoller en effectiever behandeld kunnen worden. Aangezien een negatieve lichaamsbeleving één van de kernsymptomen lijkt van een eetstoornis, dat naar het zich laat aanzien ook geassocieerd is met beloop en herstel, zou de behandeling van de lichaamsbeleving een essentieel onderdeel moeten gaan vormen binnen een eetstoornisbehandeling. Uit ons onderzoek is gebleken dat positieve lichaamsexposure, waarbinnen zowel esthetische als functionele lichaamsbeleving gecombineerd worden, een veelbelovende aanpak is. Dit proefschrift laat tevens zien dat oplossingen en interventies succesvol kunnen zijn als de klinische praktijk op een gedegen en stelselmatige wijze wordt geïntegreerd in wetenschappelijk onderzoek en vice versa. Met de in dit proefschrift gepresenteerde studies willen we een bijdrage leveren aan een vruchtbare uitwisseling tussen de klinische praktijk en de wetenschap en aan het in gang zetten van noodzakelijke veranderingen in de onderzoek agenda ten aanzien van de behandeling van lichaamsbeleving bij eetstoornissen.





## Dankwoord

Als jonge fotografe reisde ik de wereld rond. Nu, vele jaren later, is deze promotie het einde van een andere, lange, leerzame en enerverende reis. Bij het afscheid van een client, lees ik altijd een gedicht voor dat voor mij het therapieproces typeert. Voor het afscheid van mijn promotieproces en mijn dankwoord is ook een gedicht van toepassing. Het eerste couplet van het gedicht “Liedje” van Judith Herzberg sluit naadloos aan bij mijn ervaring: “Het duurt altijd langer dan je denkt, ook als je denkt het zal wel langer duren dan je denkt dan duurt het toch nog langer dan je denkt”.

Promoveren deed inderdaad een appèl op zowel mijn denk- als uithoudingsvermogen. En ik had het daarbij nooit gered zonder de steun van mijn fantastisch onderzoeksteam. Allereerst moet ik Annemarie van Elburg noemen, mijn gewaardeerde promotor, clinicus in hart en nieren, maar tegelijk ook prominent onderzoeker in het veld van eetstoornissen. Een combinatie, die ik oprecht bewonder! Ik wil je bedanken voor je voortdurende bereidheid om je uitgebreide klinische én wetenschappelijke kennis met mij te delen, zowel mondeling als schriftelijk. Ik herinner me onze eerste ontmoeting in Utrecht op de Uithof nog goed. Je was direct enthousiast over mijn project en tot mijn verrassing maakte je duidelijk hoezeer je psychomotorische therapie een warm hart toedroeg. Je enthousiasme over internationale eetstoornis congressen stimuleerde mij om daar ook mijn onderzoek te presenteren met posters of filmpje (helaas heb ik de meeste congressen online moeten volgen vanwege corona). Je steun in de zomermaanden tijdens de eindfase van mijn onderzoekstraject zal ik ook niet gauw vergeten. Je snelle reacties en opbouwende feedback in de warme zomermaanden zorgden ervoor dat ik in een flow kwam om de introductie en discussie ook daadwerkelijk op papier te krijgen. Op jouw kompas heb ik deze reis uiteindelijk kunnen volbrengen.

Tijdens het reizen is er naast een kompas ook goede navigator nodig. Mijn dierbare copromotor Jooske van Busschbach is dat voor mij geweest. Jooske, je geloofde in mij en nam mij aan als onderzoeker! Later overtuigde je mij om het avontuur van een promotietraject in te gaan. Jij navigeerde mij met je deskundige kennis door (voor mij) nieuwe en complexe statistische analyses. En je feedback op mijn teksten was grondig, uitgebreid en ter zake kundig. En er zaten ook altijd complimenten bij. Ik heb van jou het belang van positieve feedback in een tekst geleerd! Daarnaast begeleidde je mij bij mijn eerste *submit* proces. Je hielp me bij de eerste *coverletters* en *rebuttals* en laveerde mij zo door de wonderlijke wereld

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De kennismaking met Anita Jansen tijdens onze gezamenlijke deelname aan de “Multidisciplinaire richtlijn ontwikkeling eetstoornissen” vormde de vonk die mijn belangstelling voor onderzoek in gang heeft gezet. Jij had experimenteel onderzoek gedaan naar lichaamsbeleving bij vrouwen met eetproblematiek en ik had jouw bevindingen doorgevoerd in mijn behandelingen. We werden enthousiast om samen verder te onderzoeken of een positieve aandachtfocus voor het eigen lichaam daadwerkelijk van meerwaarde kan zijn om als positieve lichaams exposure aan te bieden aan cliënten met een eetstoornis. Samen met stagiaires uit Maastricht, waaronder onder andere Gerdien van Eersel en Vera Voorwinde hebben we pilot onderzoeken uitgevoerd in mijn praktijk en met lichaamsontevreden studenten. Ik vond het bijzonder om in die periode als externe onderzoeker ook een beetje bij je onderzoeksteam te horen en mijn ideeën over functionele lichaamsbeleving en positieve lichaams exposure te kunnen introduceren. Het idee van functionele lichaamsbeleving is vervolgens opgepakt door Jessica Alleva, die er voor het veld belangrijk onderzoek naar heeft gedaan. Ik wil je bedanken, voor onze plezierige en inspirerende samenwerking waarmee je voor mij de deuren naar het onderzoeksveld hebt geopend.

Vanaf nu wordt het moeilijker. Er hebben zoveel mensen stukjes met mij meegereisd, dat het onmogelijk is iedereen te noemen. Als eerste moet ik natuurlijk Aurélie Nieuwenhuijse noemen. We kennen elkaar al heel lang! Eerst was ik je begeleider van je masterthesis, die je in 2010 afrondde en natuurlijk over eetstoornissen ging. Veel later deed je bij mij een supervisietraject om uit te zoeken of je onderzoeker wilde worden. In 2018 zijn we samen begonnen aan een PhD traject onder de vleugels van Annemarie van Elburg. Ik heb veel bewondering voor de weg die jij hebt afgelegd en je ambitie om naast een ervaren clinicus ook onderzoeker te worden. We hebben veel samengewerkt vooral wanneer we onderzoeksdata verzamelden en ze samen uitwerkten. Ondanks het leeftijdsverschil hebben we ook andere eigenschappen gemeen, zoals onze passie voor de Rolling Stones en lekker koken. Geleidelijk aan werd je mijn begeleider in de digitale wereld (waar jij je in mijn ogen als een vis in het water voelt). Ik wil je ontzettend bedanken voor onze collegiale samenwerking (binnen en buiten ons onderzoek), maar ook voor onze bijzondere vriendschap en je geweldige inzet als paranimf.

Twee dierbare vriendinnen hebben aan de wieg gestaan van mijn loopbaan als psychomotorisch therapeut. Arda van der Veer (mijn andere paranimf) motiveerde mij om in het eerste studiejaar anders te gaan denken over bewegen. Jouw enthousiasme voor de psychologische en filosofische kant van het bewegen stond aanvankelijk haaks op mijn meer somatische interesse ten aanzien van bewegingsgedrag. Maar terwijl jijzelf stopte met de studie bewegingswetenschappen en medicijnen ging studeren, had je mij geïnspireerd om juist die richting op te gaan. Gelukkig kwamen onze interesses in een latere fase weer bij elkaar, toen jij na een studietraject voor huisarts, uiteindelijk koos om psychiater te worden. Ik wil je bedanken voor alle werk-gerelateerde gesprekken, discussies en overleggen, maar bovenal, omdat je al bijna 50 jaar mijn dierbare vriendin bent met wie ik zoveel lief en leed heb gedeeld.

Anja de Munck was in alle opzichten mijn studie- én werkmaatje. We volgden dezelfde afstudeerrichting, deden samen onderzoek naar mogelijke bewegingsachterstanden bij schipperskinderen en werkten samen tijdens een stage op de RIAGG Rotterdam-Zuid, waar we als pioniers ambulante PMT op de kaart zetten. Vervolgens bleven we daar jaren werken en reisden samen heen en weer tussen Rotterdam en Amsterdam. Jij verving mij tijdens mijn zwangerschapsverlof op het Centrum voor Psychotherapie, we zaten in dezelfde intervisiegroepen en samen werden we GZ-psycholoog. Daarnaast zijn we ook altijd goede vriendinnen gebleven. Ik wil je bedanken voor deze unieke vriendschap. Mijn promotietraject heb ik niet samen met je kunnen doen, maar jouw steun om ermee door te gaan is altijd erg waardevol geweest.

Voor mijn promotietraject zijn de klinische stagiaires van de Vrije Universiteit die in de afgelopen jaren in mijn praktijk stage hebben gelopen, heel belangrijk geweest. Zij hebben met zorg, inventiviteit en precisie bijgedragen aan het verzamelen, registreren en betrouwbaar opslaan en bewaren van de data voor mijn onderzoeken. Kim Gianotten, Saskia van Gulik, Marysa Persijn, Eva Fris, Nadia Erazo Castillo, Iris Egeric, Maxime Heijboer, Lisanne Aardenburg, Elena Riedel, Lotte van der Vegt en Veerle Busink ontzettend bedankt! In het bijzonder wil ik Kim Gianotten, bedanken. Jij bent na je stage jarenlang mijn co-therapeut groepsbehandeling lichaamsbeleving geweest en hebt meegedacht aan het verder ontwikkelen van het protocol Positieve lichaamsbeleving. Saskia van Gulik, jij ging na je stage werken bij Accare Centrum voor eetstoornissen Almere en verraste mij in 2016 met een eerste schriftelijke werkboekversie van mijn behandelmethodete ten aanzien van positieve lichaamsbeleving. Daaruit werd het idee geboren om samen deze behandelmethodete systematisch te gaan beschrijven, wat geresulteerd heeft in het protocol Positieve

lichaamsbeleving. Heel veel dank voor deze vruchtbare samenwerking! Tenslotte Lisanne Aardenburg. Na je klinische stage, besloot je ook een onderzoekstage bij mij te gaan doen, waarbij je heel graag het protocol Positieve lichaamsbeleving wilde evalueren. Jouw masterthesis werd de opmaat voor hoofdstuk vijf van deze dissertatie. Ik wil je heel erg bedanken voor je expertise op het gebied van statistiek en je doorzettingsvermogen om het artikel samen met ons tot een goed einde te brengen.

Tijdens zo'n lange en enerverende promotiereis heb je ook lotgenoten nodig, met wie je kan sparren, klagen over alles wat tegenzit, kennis en relevante literatuur kunt uitwisselen, Engelse drop eten en vieren dat een artikel is geaccepteerd. Die lotgenoten vond ik in onze "promotie" intervisiegroep op de Hogeschool Windesheim, bestaande uit Ingrid Nissen, Marieke Leeftang, Aurélie Nieuwenhijse, Patty van 't Hooft, Manon Smit en Albertine de Haan. Ik heb niet eens goed afscheid van jullie kunnen nemen, maar ik heb er alle vertrouwen in dat jullie ook de eindstreep gaan halen, net als Manon, die na de beruchte glijbaan, haar proefschrift net iets eerder kon verdedigen dan ik. Manon wat was het fijn om gelijktijdig met jou op te trekken en te sparren over de terminologie van lichaamsbeleving. En wat heb je mij goede methodologische tips gegeven. Ingrid, we kennen elkaar al heel lang. Van mijn supervisor werd je mijn leidinggevende aan de master PMT en samen met Thomas Scheewe hebben we in het kernteam enerverende discussies gevoerd. Als ik kwam werken op de master, werd ik altijd blij als ik je op onze werkkamer zag zitten en ik vind het ontzettend stoer van je dat je als ervaren traumadeskundige een promotietraject bent aangegaan. We zijn het veel te laat gaan doen, maar ik zal onze wandelingen in de lunchpauzes missen. Patty, ik heb je pas leren kennen in de intervisiegroep en heb bewondering voor je systematische aanpak van je onderzoekstraject en je gedrevenheid om voor dag en dauw op te staan om met ons mee te doen tijdens de periode dat je in Amerika woonde. Marieke ik weet niet hoe jij het klaar speelt om naast een klinische baan en moeder van thuiswonende tieners, ook nog tijd te maken voor je onderzoekstraject. Je was naast Manon de grote planner van onze bijeenkomsten en imponeert als een bevlogen onderzoeker ten aanzien van je doelgroep LVB. En tenslotte Albertine, voordat je recentelijk in de intervisiegroep kwam, zaten we samen in het Raakproject "Doen en meten", waar jij als junior onderzoeker was aangesteld. Jij maakte direct indruk op mij door je enorme geestdrift en je digitale vaardigheden. We hebben samen een mooi artikel geschreven: "Shared decision making en patient reported outcome measures in de psychomotorische therapie" en nu ben jij ook gestart met een promotietraject, waar diezelfde geestdrift je zeker naar de eindstreep gaat brengen.

Buiten de intervisiegroep wil ik nog een aantal andere collega's van Windesheim bedanken, die mijn onderzoek hebben gesteund. Janet Moeijes, wat ben jij een super onderzoeker, de koningin van SPSS. Jouw humor, nuchterheid en altijd tijd maken voor advies en hulp zijn hartverwarmend. Cees Boerhout, zoals ik al schreef, we maakten plannen in Dalfsen om te promoveren. Ook jou is het gelukt! Jouw bevoegenheid op het gebied van agressie bij eetstoornissen is indrukwekkend. Ik bewonder je inzet voor onderzoek binnen de Federatie voor Vaktherapie en wil je bedanken voor je opbeurende geloof in mijn promotiereis. Thomas Scheewe, wat ben jij een bijzonder mens en wat hebben we veel gedeeld als collega's en privé. Alhoewel jouw promotie al lang geleden is en je werk er inhoudelijk heel anders uit is gaan zien als hogeschoolhoofddocent en opleidingsmanager, heb ik respect voor je gedegen én *up to date* kennis op het gebied van onderzoek. Jouw inspanningen om te zorgen dat ik mijn promotietraject kon doen, blijven doen en afronden waren hartverwarmend! Als laatste heb ik nog een speciaal plekje voor Henriette van der Meijden. Je was mijn mentor toen ik bewegingswetenschappen ging studeren, waarna we elkaar 24 jaar later weer tegenkwamen als collega supervisors. Je was sindsdien niet alleen mijn klankbord op de master, maar ook daarbuiten mijn intervisiemaatje. Samen gingen we het gevecht aan om GZ-psycholoog te worden, hebben we de kwalificatie lichaamsgericht werkend psycholoog verworven en recent een mooi programma "lichaamsgerichte interventies" ontwikkeld voor de GZ-opleiding van de RINO Amsterdam. Dank voor je toewijding als vakvrouw en je ruggensteun ten aanzien van mijn promotie. Verder wil ik alle collega's van de master PMT aan de Hogeschool Windesheim bedanken voor het warme bad, dat ik daar altijd heb ervaren.

Ik ben trots op de commissieleden van de werkveldgroep eetstoornissen van de NVPMT, waarvan ik zolang voorzitter ben geweest. Stuk voor stuk kanjers in hun vak, met een grote motivatie om zowel klinisch als wetenschappelijk PMT op de eetstoornissenkaart te zetten. Johan Bosma, jij deed een prachtig masteronderzoek naar testen om de perceptuele lichaamsbeleving te meten. We gaan samen verder voor een artikel! José Bonenkamp, je hebt niet alleen een hele mooie interventie ontwikkeld om de perceptuele lichaamsbeleving te behandelen, je kan deze hoepelmethode ook elke keer weer uitermate boeiend presenteren. En Marjon Voskamp jij timmert aan de weg met de bijdrage van PMT in schematherapie bij eetstoornissen. Hopelijk ga jij ook de stap zetten om er een promotietraject van te maken. Roserieke Smidt, jij schreef destijds een hoofdstuk in het boek "Gewichtige lichamen, lichaamsbeleving en eetstoornissen". Het is mooi om te zien dat je niet kunt ophouden met werken en dat je in je eigen praktijk met warmte en ervaring mensen met eetstoornissen blijft

behandelen. En tenslotte de nieuwe voorzitter Aurélie Nieuwenhuijse, de goeroe wat betreft dwangmatig bewegen bij eetstoornissen. Jouw promotieonderzoek wordt een superbelangrijke bijdrage voor het veld! Dank voor jullie persoonlijke en professionele steun tijdens mijn onderzoektraject.

Twee jaar geleden werd ik gevraagd als wetenschappelijke dramaturg mee te werken aan de theatervoorstelling *Dis Order* van Cat Smits over het hebben van een eetstoornis. Terwijl ik in de laatste fase van mijn promotiereis was, begonnen de voorbereidingen (in Amsterdam en Noorwegen) en de voorstellingen van dit project. Het leek een ongelukkige planning, maar het was fantastisch om naast al dat wetenschappelijk denkwerk, door jou Cat uitgedaagd te worden creatief en fotografisch mee te denken. Dank Cat, dat je mij als je ex-therapeut dit cadeau hebt gegeven. Ik zal nooit vergeten hoe onder de indruk en ontroerd ik was van je spel, toen ik de voorstelling in z'n geheel de eerste keer zag. En ook dank voor al je meelevens en lieve appjes die mij een hart onder de riem staken in de laatste turbulente fase van mijn proefschrift.

Ik vrees dat dit dankwoord te lang aan het worden is. Er zijn zoveel mensen die tot steun zijn geweest in mijn promotietraject, dat het me moeite kost om het kort te houden. Ik moet denken aan het derde couplet van het gedicht "Liedje": Het kost meer moeite dan je denkt, ook als je denkt het zal wel meer moeite kosten dan ik denk dan kost het toch meer moeite dan je denkt." Dus ik ga nog even door met mijn vrijgevestigde collega's: Rob Faltin, Kees van der Meer, Elke van der Pol, Dave Chapman, Harry van Els en Annick Parker Brady in het AOC te Amsterdam. Ik wil jullie bedanken voor jullie stimulerende belangstelling en steun ten aanzien van mijn promotietraject tijdens lunchpauzes, intervisies en/of overleggen. In het bijzonder wil ik Annick noemen. Jij bent een eetstoornisbehandelaar in hart en nieren, mijn maatje met wie ik zoveel duo-behandelingen heb gedaan, en met wie ik al tien jaar samen de leergang "Eetstoornissen" op de RINO Amsterdam geef. Ik hoop nog lang met je samen te werken, maar ook lekker te eten en te wandelen in het Vechtdal, waar jij nu ook een huis hebt!

Als laatste wil ik mijn intervisiegroep noemen waar ik al bijna 20 jaar lief en leed mee heb gedeeld. We zijn allen GZ-psycholoog en/of psychomotorisch therapeut, die een eigen praktijk hebben. Onze intervisiebijeenkomsten in de middag sluiten we altijd traditiegetrouw af met lekker eten in een restaurant. Lieve Margriet Willems, Sylvia Kleijn, Jeroen van der Meer en Henriette van der Meijden bedankt voor deze mooie jaren samen. We hebben elkaars levensfasen gevolgd, interessant casuïstiek uitgewisseld en heerlijk gegeten!



Zonder vrienden en familie was deze reis nooit tot een goed einde gekomen. Jullie haalden mij even uit mijn werk of zorgden er juist voor dat ik kon werken. Alice van der Gorp, jij zorgde ervoor dat ik bij tijd en wijle in de bioscoop kon ontspannen. Hans Krot en Lidwien van de Loo, door dik en dun zijn jullie vrienden van het eerste uur. Jullie kwamen heel wat vaker (dan ik andersom), helemaal uit Voerendaal naar Amsterdam of Dalfsen om mij te kunnen blijven zien en dat heb ik erg gewaardeerd. Lieve tennismaatjes, door jullie fantastische dubbelspel bleef ik op de dinsdagochtenden tennissen. Jeroen Lückner en Marlou van Beneden jullie vertroetelden mij met heerlijke Bourgondische maaltijden met mijn lievelingsvoorafjes zoals oesters of garnalen. En Gert Oostindie en Ingrid Koulen met jullie bleef ik mooie wandelingen maken of lekker uit eten gaan. En hoe vaak jij, Yvonne van der Bijl, mij hebt horen verzuchten: "Ik heb het zo druk" weet ik niet, maar de lunches met jou waren altijd een rustpunt op drukke donderdagen. Als laatste wil ik mijn dierbare familie in het buitenland bedanken voor hun mentale steun en aanmoediging. Mijn zus H  l  ne Rekkers in Kaapstad, mijn broer Robert Rekkers in Boekarest en mijn altijd jong blijvende tante Cora Friedman in Londen

Het moeilijkste moment tijdens mijn promotiereis was het overlijden begin januari 2023 van mijn beste vriend Z  . Ik kan ik dit niet met droge ogen opschrijven. Hij was mijn *soulmate* in een vriendschap van 50 jaar waarin we meer dan familie zijn geworden. Door hem is Portugal een beetje mijn moederland geworden. Sofia, de dochter van Z   en Ana, beschouw ik als mijn Portugese dochter, van wie ik heel veel houd. Sofia, I have seen you grown up into a wise and loving woman and I deeply admire the choices you have made in your life. Z   zou apetrots zijn geweest zijn bij de ceremonie op 16 februari maar natuurlijk ook recalcitrant omdat hij zich nu eenmaal altijd verzette tegen ceremoni  le poespas. Er is nog iemand die ik speciaal wil noemen. Lieve Roos, ook jij voelt als mijn eigen dochter. Wat heb je me vaak gesteund op moeilijke priv   momenten, en wat is je belangstelling voor mijn promotietraject belangrijk voor me geweest. Ik ben supertrots op jouw carri  re. Toen je tijdelijk bij ons woonde had je wetenschappelijke aspiraties, maar het lot beschikte anders en nu ben moeder van twee pubers en nota bene op 39-jarige leeftijd de nieuwe directeur-bestuurder van CMO STAMM in Groningen!

En dan last but not least (zoals ik het overal terug zie in andere dissertaties) mijn twee dochters Esther en Carmen, hun partners en mijn grote liefde Michiel. Essie en Carmi, *love you so much*, dat jullie er zijn is nog steeds het grootste wonder in mijn leven. Jullie hebben mijn leven verrijkt met ontelbaar mooie momenten. Promoveren staat ver van jullie af, maar jullie steun en waardering was grandioos op de momenten dat ik het nodig had. Lieve Esther

en Ian, wat ben ik trots op jullie werk carrières, maar bovenal op jullie als fantastische ouders van die lieve Maeve. Het was prachtig om jou 13 maanden geleden moeder te zien worden Esther! En Ian ik bewonder hoe jij weer de weg terug hebt weten te vinden na je ernstige ongeluk. Lieve Carmen en Erwin, wat kan ik genieten van de discussies met jullie over de zinnige (en onzinnige) dingen van het leven. Erwin, ik heb grote bewondering voor jouw open levensinstelling. Carmen ik heb je ooit een eigen paard beloofd als ik echt zou promoveren, je was toen nog klein en vroeg mij heel vaak wanneer die promotie er nou aan zat te komen. Nu is het moment! Laat maar weten waar de stal moet staan.... Je hebt van je paardenpassie je beroep gemaakt en daar ben ik supertrots op. Zoals Zé al voorspelde toen je nog heel klein was: “Carmen is iemand die haar eigen weg zoekt”.

En dan mijn lief Michiel, hoe kan ik je ooit bedanken voor al je steun het afgelopen jaar om mijn promotie tot een goed einde te brengen? Zonder jou was de eindspurt niet gelukt; waar ik de moed liet zakken, bleef jij optimistisch, altijd denkend in oplossingen en stimulerend in het nemen van volgende stappen. Ik heb in tijden niet zo gelachen bij je Ted talk als Professor Random, waarmee je me verraste bij het afscheid aan de master PMT. Afgelopen jaar was je misschien te veel “de man van”, doordat er naast het promotietraject zoveel in mijn leven gebeurde. Ik hoop dat het evenwicht tussen ons straks weer gaat herstellen en dat we nog vele jaren samen kunnen genieten van het leven.



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## Curriculum vitae

After finishing high school Marlies started in 1975 her university education with the major “Human Movement Sciences” at the Free University of Amsterdam. During her internship in the last year of her programme she developed together with her fellow student Anja de Munck the field of psychomotor therapy in an outpatient setting at the youth department of the Regional Institution for Outpatient Mental Health Care (RIAGG) Rotterdam-Zuid. Afterwards, they were employed as psychomotor therapists in that institution. In this setting they made a film in 1989, called: “Ambulante psychomotorische therapie” (Outpatient psychomotor therapy), which demonstrated the possibilities of outpatient psychomotor therapy. Until that date psychomotor therapy was only practised in inpatients settings.

In 1990 Marlies started to work as a psychomotor therapist in the Centre of Psychotherapy in Amsterdam, which treated adolescents and young adults with personality disorders. In this period, she made another film. This time about psychomotor therapy within a psychoanalytic framework: “De psyche in dynamiek” (The psyche in dynamics). During her work in the Centre of Psychotherapy she noted that patients with personality disorders, who showed negative body experience often also had not-diagnosed serious eating problems. This aroused her interest in eating disorders and the prominent role of body experience in this disorder. For this reason, she followed a three-year post-graduate course “Eating disorders” at the Regional Institution for Professional Development and Education in the Mental Health Care (RINO) and started in 1998 to work at the eating disorder clinic Novarum in Amsterdam. After two years, she started her own practice in Amsterdam, which she has until the present day. Gradually, she specialized herself in the treatment of eating disorders, in particular, the treatment of negative body experience.

Marlies became a licensed Mental Health Care (MHC) psychologist after a two-year post-master training programme (2002) and acquired the qualification Lichaamsgericht Werkend Psycholoog (LWP; Body Oriented Working Psychologist) in 2004. Besides her clinical work, she was active as lecturer and supervisor at several universities. She was, for instance, affiliated with the programme of Expressive movement at the Fontys University of Applied Sciences in Tilburg (1998-2008), the master Expressive therapy at HAN University of Applied Sciences in Nijmegen (2010-2013) and the master Psychomotor therapy at Windesheim University of Applied Sciences in Zwolle (1999-2023).

Marlies started her career as a researcher at the faculty of Movement Sciences of the



Free University (2005-2008). Together with Mia Scheffers she investigated available measure instruments with the focus on body experience. From 2006 to 2010 she was connected to Maastricht University as an unsalaried external researcher, where under the auspices of prof. dr. Anita Jansen she examined body exposure in the field of eating disorders. In 2014 she was asked to become a researcher at the School of Human Movement and Education of Windesheim University of Applied Sciences, which resulted in 2018 in a PhD project in conjunction with Utrecht University. In this PhD project Marlies focused on body experience measurements as well as on body-oriented interventions for the treatment of negative body experience in eating disorders.

Since 2005 Marlies has given various courses at the RINO Amsterdam, including the course “Eating disorders” with Annick Parker Brady. She participated in the development and recent update of the Dutch practice guideline for the treatment of eating disorders (2005, 2017, 2023). As a member of the commission Prevention and early treatment of eating disorders of the Health Council of the Netherlands (Gezondheidsraad), she contributed to the Advisory report: “Preventie en vroege behandeling van eetstoornissen” (Prevention and early treatment of eating disorders; 2022). From 2010 to 2023 she was the chair of the work field section eating disorders of the Dutch Association of Psychomotor therapy (NVPMT). She is co-author of the books: “Gewichtige lichamen. Lichaamsbeleving en eetstoornissen” (Heavily important bodies. Body image and eating disorders; 2002) and “Protocol Positieve lichaamsbeleving” (Protocol Positive body image; 2018). In 2019 she received the “Klaas van Roozendaal Prize” (Oeuvr Award, Professional) for professionals who have made a scientific contribution to the field of psychomotor therapy.

Marlies is married to Michiel Baud and has two daughters: Esther and Carmen. During the years 1984-2003 she also worked as a professional photographer. Nowadays in her free time, she continues to engage in photography (Instagram: @Mrekkers) and likes to do sports especially hiking and playing tennis.

## Curriculum vitae

Na het behalen van haar Vwo-diploma begon Marlies in 1975 aan de studie Bewegingswetenschappen aan de Vrije Universiteit in Amsterdam. In de laatste fase van deze studie liep zij stage bij jeugdafdeling van de RIAGG Rotterdam-Zuid, waar ze samen met haar studiegenoot Anja de Munck psychomotorische therapie (PMT) introduceerde en ontwikkelde. Na deze één-jarige stage werden zij gevraagd om daar te blijven werken als psychomotorisch therapeuten. Om de mogelijkheden van ambulante PMT te demonstreren maakten zij in 1989 de videofilm: “Ambulante psychomotorische therapie”. Tot dan toe werd PMT alleen in klinische settingen beoefend.

In 1990 maakte Marlies als psychomotorisch therapeut de overstap naar het Centrum voor Psychotherapie te Amsterdam, waar de behandeling gericht was op adolescenten en jongvolwassenen met persoonlijkheidsstoornissen. Ook op deze werkplek maakte zij een videofilm. Deze videofilm, over PMT binnen een psychoanalytisch referentiekader, had de titel: “De psyche in dynamiek”.

Gedurende haar werk in het Centrum voor Psychotherapie merkte Marlies op dat bij cliënten met persoonlijkheidsstoornissen, waarbij sprake was van een negatieve lichaamsbeleving, er in veel gevallen ook niet-gediagnosticeerde serieuze eetproblemen speelden. Dit wekte haar interesse op in eetstoornissen en de prominente rol die een negatieve lichaamsbeleving hierin kan spelen. In dit kader volgde zij de driejarige postacademische opleiding “Eetstoornissen” aan de RINO Amsterdam en begon in 1998 te werken in de eetstoornissen kliniek Novarum in Amsterdam. Na hier twee jaar gewerkt te hebben startte zij met een eigen praktijk in Amsterdam, waar zij tot nu werkt. Gaandeweg heeft zij zich in deze praktijk verder gespecialiseerd in de behandeling van eetstoornissen en de negatieve lichaamsbeleving in het bijzonder.

Marlies haalde haar GZ-psycholoog registratie in 2002 en verkreeg in 2004 de kwalificatie Lichaams Gericht Werkend Psycholoog. Naast haar klinische werk, heeft ze als docent en supervisor gewerkt aan diverse opleidingen, zoals de opleiding voor Bewegingsexpressie aan de Fontys Hogeschool in Tilburg (1998-2008), de master Vaktherapie aan de HAN in Nijmegen (2010-2013) en de master PMT aan Hogeschool Windesheim in Zwolle (1999-2023).

Zij startte haar carrière als onderzoeker aan de faculteit Bewegingswetenschappen van de Vrije universiteit in Amsterdam (2005-2008). Samen met Mia Scheffers deed zij

onderzoek naar beschikbare meetinstrumenten op het gebied van lichaamsbeleving. Van 2006 tot 2010 was ze als onbezoldigde externe onderzoeker verbonden aan de Universiteit van Maastricht, waar ze onder leiding van prof. dr. Anita Jansen de behandeling van eetstoornissen met behulp van lichaamsexposure onderzocht. In 2014 werd ze gevraagd voor een baan als onderzoeker bij het lectoraat Bewegen, Gezondheid en Welzijn van de Hogeschool Windesheim in Zwolle. Dit resulteerde naderhand in 2018 in een promotietraject in samenwerking met de Universiteit Utrecht. In dit promotietraject heeft Marlies zowel het accent gelegd op meetinstrumenten die lichaamsbeleving in kaart brengen als op lichaamsgerichte interventies ten aanzien van de behandeling van negatieve lichaamsbeleving bij eetstoornissen.

Marlies geeft sinds 2005 diverse cursussen op de RINO Amsterdam, waaronder samen met Annick Parker Brady de “Leergang Eetstoornissen”. Namens de vaktherapie nam zij deel aan de ontwikkeling en recente update van de voorheen Multidisciplinaire richtlijnen en de huidige Zorgstandaard Eetstoornissen (2005, 2017, 2023) en werkte zij mee als commissielid van de Gezondheidsraad aan het adviesrapport “Preventie en vroege van behandeling eetstoornissen”. Vanaf 2010 tot 2023 was ze voorzitter van de werkveldgroep eetstoornissen van de NVPMT. Zij is de co-auteur van de boeken “Gewichtige lichamen Lichaamsbeleving en eetstoornissen” (2002) en “Protocol Positieve lichaamsbeleving” (2018). In 2019 ontving ze van de NVPMT de Klaas van Rozendaal prijs voor professionals die een wetenschappelijke bijdrage hebben geleverd aan het vakgebied van de PMT.

Marlies is getrouwd met Michiel Baud en heeft twee dochters Esther en Carmen. Ze werkte van 1984 tot 2003 ook als professioneel fotograaf. In haar vrije tijd ligt haar passie nog steeds in het fotograferen (Instagram: @Mrekkers) en houdt ze van sporten, met name wandelen en tennissen.





Eating disorders (EDs) form a world-wide challenge. This thesis departs from the idea that solutions and interventions can only be developed by integrating the results of clinical practice into academic research and vice versa. The aim of this thesis is to extend knowledge related to assessment and treatment of negative body experience in EDs, with an emphasis on the role of body functionality in reducing body dissatisfaction. It highlights the importance of body experience problems in EDs. It argues that negative and/or disturbed body experience may be a core problem in EDs. This makes an effective treatment of body experience problems an essential element of the treatment of EDs. Doing so, the thesis underlines the importance of positive body exposure that contains and integrates both positive aesthetic and functional body experience.