

Body Experience and Mirror Behaviour in Female Eating Disorders Patients and non Clinical Subjects

Michel Probst

University Psychiatric Center
K.U.Leuven, Campus Kortenberg,
Belgium
Department of Rehabilitation Sciences,
Faculty of Kinesiology and
Rehabilitation Sciences, K.U.Leuven,
Belgium

Davy Vancampfort

University Psychiatric Center K.U.
Leuven, Campus Kortenberg, Belgium
Department of Rehabilitation Sciences,
Faculty of Kinesiology and
Rehabilitation Sciences, K.U. Leuven,
Belgium

Guido Pieters

University Psychiatric Center K.U.
Leuven, Campus Kortenberg, Belgium

Johan Vanderlinden

University Psychiatric Center
K.U.Leuven, Campus Kortenberg,
Belgium

Abstract

Recently the attention for mirror exercises in therapies targeted specifically to body experience concerns has increased. This retrospective study will explore the mirror behaviour of anorexia nervosa (AN), bulimia nervosa (BN) and non-clinical female subjects (CG) and investigate whether mirror avoidance or checking are related to negative body experiences.

The group of eating disorders consisted of 560 AN and 314 BN patients. The control group consisted of 1151 female subjects. The Body Attitude Test and the Eating Disorder Inventory subscales drive for thinness and body dissatisfaction were used. To explore the mirror behaviour, one item of the Body Attitude Test 'I am observing my appearance in the mirror' was used. Nonparametric analyses (Spearman rho correlations, Kruskal-Wallis and Mann Whitney test) were used because of the categorical data.

BN patients observed their body more often in the mirror than AN patients and the control subjects do. Age and BMI showed no significant main effect of mirror frequency. The relation between the frequency of mirror behaviour and body experience were significant but low (under .40). AN patients and control subjects with a mirror checking behaviour had a more negative body experience than those with mirror avoidance behaviour. In the BN group, no differences were found.

✉ Michel Probst, University Psychiatric Center, K.U. Leuven, Campus Kortenberg
Leuvensesteenweg 517, B-3070 Kortenberg, Belgium. E-mail: *michel.probst@faber.kuleuven.be*

There is support to integrate mirror exercises in a treatment of eating disorder patients. From a clinical point, mirror exercises are preferably combined with a body oriented therapy within a multidimensional cognitive behavioural approach. Recommendations for mirror exercises based on the clinical experience are given.

Keywords: mirror; mirror exposure; mirror avoidance; mirror checking; body experience, eating disorders

INTRODUCTION

Body experience is a multidimensional concept with at least three aspects: the neurophysiologic aspect refers to perceptual experiences as visual spatial, sensory judgements, physical sensations, body awareness, body recognition, physical appearance, body size and shape. The psychological aspect refers to on the one hand the cognitive experience (thought process and thinking styles) and to the subjective experiences (feelings, emotions affect and mood) on the other hand. A fourth behavioural component might actually be the result of neurophysiologic and psychological aspects (Garner & Garfinkel, 1981; Bielefeld, 1986; Cash & Pruzinsky, 1990; Slade, 1994; Thompson, 1996; Probst, 1997 & 2006).

In the eating disorder pathology, body image disturbance is a central theme. The experience and significance of body weight and shape are distorted. Persons suffering from an eating disorder evaluate their body structure, their size or certain body parts in an unrealistic way. Even when clearly underweight, some experience their appearance as normal or even too fat (APA, 1994). The discrepancy between the way they see themselves and the way they see others is striking: in most cases, they can give a pretty accurate estimate of another patient's body size while they do not realize they themselves look the same or even worse! Furthermore, they have wrong ideas about the consequences of eating on their body structure. After a meal they feel their stomach is 'bulging' or their belly is 'swelling'. Most patients with eating disorders nourish a very negative attitude towards their own bodies and their physical appearance in general. They are constantly watching their body, criticising it relentlessly or fighting it. Others avoid seeing themselves (naked) and often hide in loose clothing. Generally they are dissatisfied with certain body parts (usually their belly, thighs or bottom). But this dissatisfaction can also apply to body parts that are not related to weight (wide hips, short height, short legs and narrow shoulders).

This dissatisfaction however, does not lessen with weight loss. Their attitude can be compared with that of people suffering from 'imagined ugliness' or body dysmorphic disorder, who repeatedly undergo plastic surgery. A minority of patients with anorexia seems to be proud of their emaciated looks (which they seem to show in an almost 'exhibitionistic' manner), but for most of them the weight loss doesn't at all increase their satisfaction. However low their weight, they continue

experiencing themselves as too fat. Along with frequent weighing or mirror inspections, some develop their own standards, such as 'my ribs must show' or 'the inner part of my thighs shouldn't touch when I am standing'. Patients suffering from an eating disorder lack confidence in their own bodies; they experience their bodies as something annoying and they don't feel 'at home' in it. They dislike being touched and have trouble with physical closeness in general. This feeling of alienation can resemble depersonalisation (or a form of dissociation), similar to what occurs following physical or sexual abuse. In their self experience, the way they think others think about them often plays an important role. And they generally anticipate a negative opinion. It is as if they looked at themselves through the eyes of someone very critical. This way, the opinion they have of themselves is constantly subject to conflicting points of view: 'how do I see myself' (the internal lens), 'how do others see me' (the external lens), 'how do I really look' (the unbiased or neutral lens) and 'how would I like to look like' (the ideal lens). The more the four lenses diverge, the more problematic the self perception. The core problem resides in the absence of self esteem and the negative self perception, which is expressed in the negative body image. The translation of 'discord with one's self' into 'discord with their body' is highly culturally defined (Probst, 1997, 2006).

This clinical description of the specific body experience of eating disorders illustrates the perceptual, cognitive, affective and behavioural aspects. It seems obvious that the confrontation with their own body plays an important role in the body experience. Eating disorder patients commonly complain that they look fat when they look in the mirror. Mirrors play an important role in their lives.

Today mirrors are made of glass that has been coated on one side with a thin layer of reflective silver or aluminium plate. The knowledge about the physics of light is well-known. Nothing is mysterious about the reflected image in the mirror or the relationship between the reflection and the reality behind it. This was not always the case in the past.

In the old days, the mirror was considered a mysterious object with spiritual powers. This is clearly expressed in Rodenbach's short story (1901): "... The hero does himself in, by running headlong into his mirror, believing he will penetrate it. He dies as a consequence thereof. He is both created and effaced in his own image..."

Recently different authors promoted the incorporation of a kind of mirror therapy in the development of therapies targeted specifically on body experience concerns. Mirrors are seen as a therapeutic ally. Mirrors could be helpful in forming a more stable integrated mental representation, they could break through the denying and could provoke an intense reality testing (Wooley & Wooley, 1982; Norris, 1985; Orbach 1984; Cash & Pruzinsky 1990; Probst, Van Coppenolle, & Vandereycken, 1995; Gardner, Gallegos, Martinez, & Espinoza, 1999; Freedman 1988, 2003; Key, George, Beattie, Stammers, Lacey, & Waller, 2002; Shafraan,

Fairburn, Robinson, & Lask, 2003; Tuschen-Caffier, Vögele, Bracht, & Hilbert, 2003; Farrell, Shafran, & Fairburn, 2003; Probst, 2006).

Analysing the mirror behaviour, three behaviours are taken into account: the normal mirror behaviour, the mirror avoidance and the mirror checking. Mirror avoidance implies refusing to look in mirrors. Mirror checking is defined as constantly examining or judging specific body parts, their shape or weight change in the mirror.

This retrospective study had two aims. First, it will explore the mirror behaviour of anorexia nervosa, bulimia nervosa and non-clinical female subjects. Second, it will investigate whether mirror avoidance and mirror checking are related to negative body experiences with the hypothesis that mirror checking could be associated with higher levels of body experience pathology.

METHOD

Participants

The group of eating disorders consisted of 560 anorexia nervosa (AN) and 314 bulimia nervosa patients (BN) consecutively admitted at the inpatient eating disorder unit of the university psychiatric centre, campus Kortenberg (Belgium). The diagnose was made by highly experienced psychiatrist according to DSM-IV criteria (APA, 1994). The patients completed the questionnaires upon admission to the specialised inpatients unit for eating disorders.

The control group consisted of 1151 female volunteers equally divided in groups of high school students, students of higher non-college level education, college students and employees. The control subjects (CG) voluntarily completed the questions in reference of different previous studies with these questionnaires. Subjects with a symptomatic eating behaviour measured by the Eating Disorder Evaluation Scale (EDES; Vandereycken, 1993) were excluded.

The general characteristics of all subjects are presented in Table 1. The differences between the subgroups with respect to age, weight, body mass index, duration of illness reflect the diagnostic differentiation.

Table 1. The general characteristics of the experimental and control group

	AN N = 560	BN N = 314	CG N = 1151	F _{2,2023} ^a
	1	2	3	
Age (years)	21.9 _{2,3}	23.4 _{1,3}	19.3 _{1,2}	266.91**
Weight (kg)	39.9 _{2,3}	59.5 _{1,3}	57.6 _{1,2}	682.17**
Height (cm)	165.3	165.7	166.1	4.26
BMI (kg/m ²)	14.7 _{2,3}	21.7 _{1,3}	20.5 _{1,2}	815.80**
Duration of illness (years)	4.2 ₂	5.8 ₁	-	17.87**

**p < .01

^a duration of illness df = 1, 872

Subscripts refer to significant differences between groups measured with Post hoc Scheffe test

Measures

The Body Attitude Test (BAT; Probst, Vandereycken, Van Coppenolle, & Vanderlinden, 1995, Probst, Van Coppenolle, & Vandereycken 1997, Probst, Pieters, & Vanderlinden 2008) is intended to measure the subjective body experience and the attitude towards one's body. The BAT is a 20 item self-report questionnaire developed for female eating disorder patients. Repeated analyses yield a stable factor structure: negative appreciation of body size, lack of familiarity with one's own body. The questionnaire shows good reliability (internal consistency and test-retest) and validity (convergent and discriminant).

The Eating Disorder Inventory (EDI; Garner, Olmsted, & Polivy, 1981) is a widely used 64-item questionnaire aimed at assessing the psychological characteristics, eating related attitudes and traits of AN and BN. The scale is reliable and has been validated extensively. In this study only the subscales drive for thinness and body dissatisfaction were used.

To explore the frequency of mirror behaviour, one item of the Body Attitude Test 'I am observing my appearance in the mirror' was used. Item responses were recorded using a six-category Likert type response format. Subjects have the choice of six possibilities: always (5), usually, often, sometimes rarely and never (0). Test – retest reliability of this item using a one week interval is very high (n = 35; r = .89, p < .01; Probst, Vandereycken et al, 1995). Subjects who marked the response category "never" or "always" were respectively referred to as the mirror avoidance or mirror checking group.

Statistical analysis

The current report is based on a field research study with a retrospective design. Nonparametric analyses were used throughout, because of the categorical data. First the groups' levels were compared using Kruskal-Wallis tests, with post hoc Mann Whitney tests ($p < .05$) to determine pair wise differences.

The associations between mirror behaviour and other body image questionnaires were tested using Spearman rho correlations. Bonferroni's correction was used to reduce the risk of type 1 errors in these correlations resulting in a relatively stringent alpha level ($p < .001$). Because the correlations presented here are based on large numbers, even weak associations are likely to attain statistical significance. Consequently, it is important to consider the size of the effect when examining the intercorrelations. We used the following classification according to Surwillo (1980): 0-39 = low; 40-69 = moderate to substantial; 70-100 high to very high.

RESULTS

A Kruskal-Wallis ANOVA by ranks showed a significant difference between the three groups for mirror observation (Table 2). Post hoc Mann-Whitney tests (AN versus BN, $z = 3.69$, $p < .001$; BN versus CG, $z = 3.97$ $p < .001$) revealed that BN patients (mean & SD = 3.0 ± 1.6) observe their body more often in the mirror than AN patients (mean & SD = 2.6 ± 1.5) and the CG (mean & SD = 2.6 ± 1.3).

Table 2. Frequency of mirror behaviour in anorexia nervosa, bulimia nervosa and control subjects

		Never	Rarely	Sometimes	Often	Usually	Always	Total	Kruskal-Wallis $H_{2,2025}$
Anorexia nervosa	N	49	93	151	108	74	85	560	17.74***
	%	8.8	16.6	27.0	19.3	13.2	15.2	100	
Bulimia nervosa	N	19	47	55	69	52	72	314	
	%	6.1	15.0	17.5	22.0	16.6	22.9	100	
Control group	N	70	139	375	271	179	117	1151	
	%	6.1	12.1	32.6	23.5	15.6	10.2	100	

*** $p < .001$

Kruskal-Wallis ANOVA's were conducted separately for the variables age and BMI and showed no significant main effect of mirror frequency.

Table 3 reports the Spearman rank correlations for the different groups between the item mirror behaviour and BAT (with subscales) and Drive for Thinness and Body Dissatisfaction of the Eating Disorders Inventory (EDI). Spearman rank

correlation between frequency of mirroring and these body image variables are significant but low (under .40). Those correlations may be significant, but nonetheless not even 15% of the variance is not accounted for.

Table 3. Spearman rank correlation of the degree of frequency of mirror behaviour and body experience variables

	Anorexia nervosa	Bulimia nervosa	Control group
BAT Total	.33***	.16	.38***
BAT 1	.29***	.07	.25***
BAT 2	.11	.04	.19***
BAT 3	.20***	.03	.27***
EDI-DT	.29***	.17	.20***
EDI-BD	.18***	.13	.16***

***p < .001

BAT – Body Attitude Test; EDI-DT/BD – Eating Disorder Inventory subscale Drive for Thinness/Body Dissatisfaction

Mann Whitney conducted for the body experience variables between the subjects of the mirror checking and mirror avoidance group of the three different groups separately shows for AN and control groups only significant differences between mirror avoidance and mirror checking for the variable BAT, Body Dissatisfaction, and Drive for Thinness. In the BN group, no differences were found (see Table 4). Additional analysis revealed the same results if mirror avoidance is defined as never or rarely and mirror checking as always and usually.

Table 4. Comparison between mirror avoidance and mirror checking on body experience variables

Test	Group	Mirror avoidance	Mirror checking	z adjusted ^a
BAT	Anorexia	41.3 ± 23.7	63.5 ± 17.0	5.51***
	Bulimia	63.0 ± 29.0	71.6 ± 14.3	0.24
	CG	21.9 ± 17.1	45.6 ± 19.7	7.44***
EDI-DT	Anorexia	9.2 ± 7.6	16.1 ± 5.5	5.23***
	Bulimia	15.2 ± 6.8	15.8 ± 5.3	0.80
	CG	2.8 ± 4.9	8.2 ± 6.9	5.00***
EDI-BD	Anorexia	12.6 ± 7.1	16.7 ± 7.2	3.22***
	Bulimia	17.6 ± 7.9	19.9 ± 6.3	0.91
	CG	7.4 ± 8.1	13.1 ± 8.9	3.71***

***p < .01

^a Mann Whitney U test

BAT – Body Attitude Test; EDI-DT/BD – Eating Disorder Inventory subscale Drive for Thinness/Body Dissatisfaction

DISCUSSION

Mirrors are to image what scales are to weight (Freedman, 1988). Mirrors induce a self-centrality, show a greater awareness of one's own emotions and inner feelings, decrease the self-esteem and increase conformity to the prevailing standard. Mirrors have three important effects. They make subjects more self-conscious, more critical and more conforming. Mirror feedback can increase guilt, intensify self-dissatisfaction and affect mood (Fisher, 1986; Freedman, 1988). Some authors mention that the mirror is an illusion, one-half actual size. In fact, the size of one's reflection in a mirror is considerably smaller than one's real life body size in (Rabin, 2003; Shafran et al., 2003).

This study showed that women with eating disorders check their body significantly more often than women with no history of eating disorders do. Extreme frequency of mirror behaviour is not found. BN patients checked more than AN and CG. There was no strong association between the frequency of mirror behaviour and body experience. Unlike mirror avoidance, mirror checking involves more negative body experience in AN and control subjects. In BN, no interaction between body experience and mirror behaviour is found. These findings confirm the study of Philips (1996).

Nor age neither body mass index have an influence on mirror behaviour. Mirror behaviour seems the same for adolescents and older subjects. A low or a high BMI did not interfere with the mirror behaviour of AN, BN and CG.

Mirror checking indicates a preoccupation with oneself or one's body and is an externalisation of curiosity. It reveals a deep need to inspect and control the body and body changes in a vain pursuit of a perfect body (narcissistic feature). It also reveals low self-esteem, anxiety or an addictive behaviour. In some cases, subjects do not need constant control. Shaping their bodies does not play such an important role in their lives.

In this discussion, the study of Jansen et al. (2005) can be important. The eating symptomatic participants give priority to inspect their own 'ugly' body parts. In the non eating symptomatic group, subjects focused more on their own pretty parts and less on their ugly body parts. When viewing other bodies, the patterns are reversed; high symptomatic participants focused their attention on the beautiful parts of other bodies whereas normal controls concentrated on the ugly parts of the other bodies. Hence, to be successful, the hypothesis is that a change in the processing of information might be needed for body exposure (Jansen, Nederkoorn, & Mulken, 2005).

Two methodological limitations of the present study must be considered. First, this study is a retrospective study that investigates only one aspect of mirror checking (frequency) and second, it is based on the information of one item of the BAT. The charge of the question and the response format is not necessarily the same for all, subjects even though the stability of these item. Patients with eating

disorders are often not fully aware of this behaviour. The study provides raw information about the frequency but does not give information about the way subjects look into the mirror, what they thought and feel or what they focus on during mirroring. The pattern of alternating between repeatedly checking and actively avoiding the mirrors was not taken into account. Nevertheless, the large sample, the excellent test retest item reliability and the expanded response format used provide finer discriminating information about participants mirror behaviour and thus allow us to generalise the tendency.

Scientific and clinical findings concerning mirror exercises

The data of this study provide some indication to address mirror exercise in the treatment of eating disorders. The aim of the mirror exercises is to learn to use the mirror in a different way and to deal with the mirror and the associated emotions in a constructive way. The mechanisms responsible for mirroring are not known. Most likely mirroring is due to a combination of perceptual, affective, cognitive and physiologic components of body perception. There is evidence that body exposure leads to a reduction of overestimation (Norris, 1984; Goldsmith & Thompson, 1989; Farrell et al. 2003, Vocks, Legenbauer, Wächter, Wucherer, & Kosfelder, 2007), negative cognitions (Jansen et al, 2005; Key, 2002; Freedman, 2003; Mountford, Haase, & Waller, 2006) and feelings of fear, uncertainty and sadness (Tuschen-Caffier et al., 2003) as well as to the activation of the autonomic and endocrine system in the hypothalamus.

Mirrors can be a useful tool for transforming body image when constructively combined with the power of visualisation (Kreuger & Schofield, 1996; Freedman, 2003), with cognitive behavioural therapy (CBT; Key et al., 2002; Jansen et al. 2005) and with empirically supported CBT exposure therapy and mindfulness-based approaches (Wilson, 1999; Delinsky and Wilson, 2004). Delinsky & Wilson, (2004) found that mirror exposure was effective in increasing body image satisfaction, reducing body image avoidance and body checking.

Jansen et al. (2005) mentioned also that mirror exercises are very efficient if they are combined with cognitive restructuring. If not, the preoccupation with dissatisfaction can maintain the eating disorders. Mirror confrontation influences the subject's ability to estimate one's own body size (Norris, 1984) and a negative body image can be treated by correcting feedback exercises (Garner & Garfinkel, 1981). Key et al. (2002) discovered that in AN, CBT in combination with mirror exercises are more effective than CBT without these exercises.

Hilbert et al. (2002) state that mirror exposure may be useful for improving the awareness of body related cognitive errors as negative bias, unrealistic standards and dichotomous thinking. They concluded that in binge eating disorder repeated mirror exposure increases levels of negative mood, appearance and self-esteem as well as the frequency of negative cognitions in binge eating disorder (BED).

Regular confrontation by mirrors incorporated in a cognitive behavioural approach could provide a diminished dissatisfaction with the body and a reduced anxiety towards the body. This would lead to a decrease of avoidance behaviour. The patients even experience a feeling of success when the time of exposure is progressively increased. The emotional response is much higher in mirror confrontation than in other exercises.

Recommendations for mirror exercise based on our clinical practice

It is obvious that there are different ways to accomplish mirror exercises. From our clinical experience with mirror exercises, we propose some basic recommendations. The therapist offers a safe and relaxing framework with respect for the privacy. He informs the patient in detail concerning the way in which the exercises are carried out and what is expected from the patient. Firstly, the therapist evaluates the attitude of the patient towards the mirror. The patient gets as much responsibility as possible during the exercise. The patient is advised to carry out the exercise in underwear. The exercise lasts approximately 30 minutes. In function of the patient, the therapist has a gradation of possibilities. The therapist does not look at the patient and refrains as much as possible from all comments during the discussion. The frequent implementation of the mirror exercise (for example twice a week) at several times (for example during the morning and in the afternoon; before and after the meals) has a certain habituation effect.

In the beginning, the exercises are carried out exclusively under supervision of a therapist. The exercises can be done in-group (with respect for everyone's privacy) or individually. Afterwards the patient can exercise alone or with her partner. Keeping a mirror diary in which the frequency, the duration, the degree of fear before and after the exercise and the feelings during the exercises are noted can prove very useful. In some cases the use of a hand mirror, body lotion and background music is helpful.

Our mirror exercises consist of different steps. The first instruction given to patients is to look, to observe and to describe, here and now, in a neutral, objective, respectful, mild and curious manner their own body in the mirror. This is not done with the purpose to criticize or to compare but to increase familiarity with one's own body. When the patient stands in front of the mirror, she must learn to feel that it is she herself who has the control over herself and not her negative feelings. By closing her eyes, the patient can compare the image in the mirror with her mental picture. Furthermore the attention can start focusing on possible changes of the picture and the patient can start looking for body parts that friends find attractive. While she is looking at herself in the mirror, the therapist asks her to deal with different questions such as 'who am I', 'who do I think I am', 'what do I do during my mirror exercises', 'what are my wishes for the future', 'who do I want to be'. At the end of the mirror exercise, the therapist asks the patient to congratulate herself

on the courage and effort that was needed to successfully complete the exercise. Finally, the therapist invites her to persuade herself that she is worth it by standing straight up, look deeply into her own eyes and to say out loud and with conviction: "I am worth it". The session ends with the therapist talking about and evaluating the mirror exercises.

An alternative exercise consists of the patient standing in front of the mirror and communicating her feelings, thoughts and experience aloud to the therapist or her partner. She has to give a description of herself such as she would do for a blind person. The therapist or the partner can intervene when unrealistic and too negative coloured comments are given. In other cases she could, while looking in the mirror, answer the therapist's questions.

Beside the BAT and the EDI who assess more generic aspects of body experience different other specific measures are tailored to assess body avoidance or body checking: the Body Checking Questionnaire (Reas, Whisenhunt, Netemeyer, & Williamson, 2002; 23 items; subscales: overall appearance, specific body parts idiosyncratic checking); the Body Checking Cognitions Scale (Mountford et al., 2006; 19 items; subscales: objective verification, reassurance, safety beliefs, body control); the Body Image Avoidance Questionnaire (Rosen, Srebnik, Saltzberg, & Wendt, 1991; 19 items; avoidance of tight fitting clothes, social outings, physical intimacy).

As a conclusion, we can state that there is a support to integrate mirror exercises in a treatment of eating disorder patients. Regular mirror confrontation together with a cognitive behavioural approach can lead to a decrease of body dissatisfaction. Also the fear to look at one's own body decreases. This will lead to less avoidance behaviour. The patient experiences a feeling of success when the duration of exposure increases gradually. The emotional response is higher with mirror exercises than with other exercises. From a clinical point, mirror exercises are preferably combined with a body oriented therapy that also proposes other body work and within a multidimensional cognitive behavioural approach. The therapist must remain alert for possible negative impact of body exposure on the self perception, such as negative fixations and a changing mood. For this reason a preceding interview and a debriefing after the mirror exercises are advisable.

Patients in our inpatient treatment program retrospectively reported greatly valuing the mirror exercises that are incorporated into the body image treatment (Probst, Van Copenolle et al., 1995; Probst, 1999 & 2006). Some AN and BN patients state that mirror exercises are one of the most important ingredients of our treatment program (Probst, 2007). These clinical impressions are supported by other authors.

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