Thin is going to win?

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Thin is going to win?
Disordered eating in sport

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Voor oom en tante
die mijn mogelijkheden als eerste zagen
en mij de liefde voor sport al vroeg bijbrachten

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Thin is going to win?
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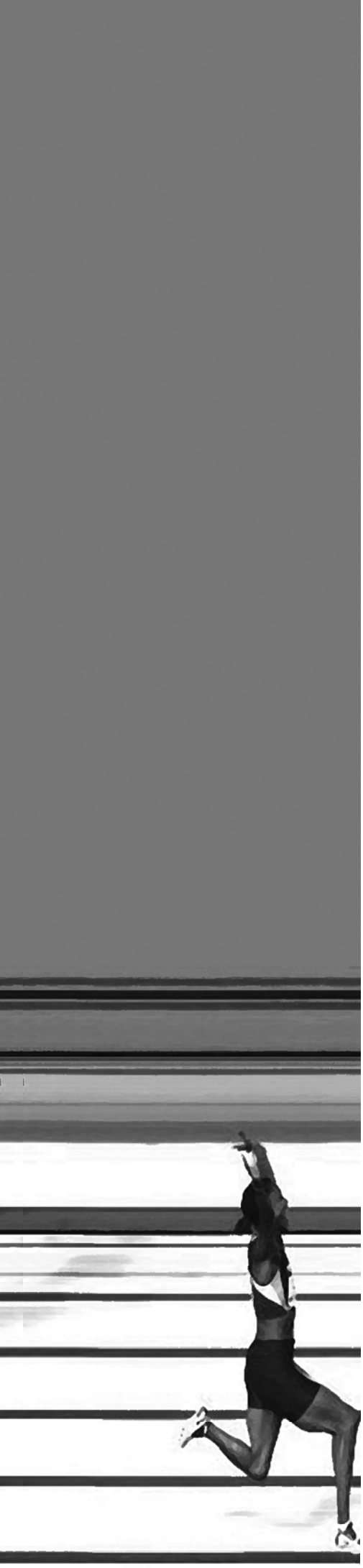


Chapter 1

General introduction

Introduction

Introducing eating disorders in sport

Leontien van Moorsel, the most famous female cyclist from the Netherlands, recounted in her recently published autobiography:

> "When I look back, it is very strange that I -of all people- got an eating disorder. In our family, food and drinks were just part of coziness. As a child or adolescent, I never had any problems with my body. In 1989, I participated in the Tour Feminine and finished 31st, which wasn't so bad for a beginner, yet it bothered me. Those 30 women who finished before me were older and weighed at least 5 to 10 kilos less. I knew I was talented enough to win the Tour but I also knew that in order to win it was necessary to lose weight". Her father explained: "Then she went to a cycling school in Spain where it went terribly wrong. They learnt her how much faster she could climb a mountain if she weighed less". Leontien herself added: "I lived on a small piece of bread in the morning and one in the afternoon. Before breakfast we had already ran for half an hour and before lunch we had covered 100 kilometers. After lunch we were dropped somewhere by car and had to walk back to camp. Everything was focused on burning calories. In those 3 weeks I lost the 10 kilos for which my Dutch coach had planned a 3-year trajectory. My mother came to pick me up at the airport. She hardly recognized me. I weighed 54 kilos. I had reached my goal. And of course I should have kept it with that …" (Hurkmans, p. 56-57, translated by De Bruin).

Eating disorders could be described as medical and psychological disorders characterized by serious disturbances in eating and weight control behaviors as well as in body image (American Psychiatric Association, APA, 1994). In the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) two types of clinical eating disorders are distinguished, namely anorexia nervosa and bulimia nervosa, in addition to so called eating disorders not otherwise specified that do not fully meet the diagnostic criteria set for anorexia or bulimia (APA, 1994).

According to a meta-analysis on risk factors for eating disorders, cross-sectional studies are consistent in finding elevated rates of eating disorder symptoms or broader sub-clinical eating disorders in female athletes, primarily in aesthetic and weight-related sports. For the full syndromes of eating disorders, however, the results are much less clear (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004). Because of the statistically significant associations of eating disorder symptomatology with sport participation, it was concluded that athletic competition or participation in a competitive weight-related subculture could be classified as a risk correlate for eating disorders (Jacobi et al., 2004).

Research investigating eating disorder occurrence in sport has shown an increased prevalence in elite women athletes in comparison with non-elite athletes or non-athletes (e.g., Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen, 1993). A recent study of Sundgot-Borgen and Torstveit (2004) in Norway showed that 20% of the elite female athletes and 8% of elite male athletes suffered from clinical or sub-clinical eating disorders compared to 9% of the general female population and 0.5% of the Norwegian men, pointing towards elite athletes as an important risk group for eating disorders. More specifically, 2% of the elite female athletic population appeared to be suffering from anorexia, 6% from bulimia and 12% was diagnosed with eating disorders not otherwise specified. Elevated prevalence was especially found in aesthetic sports (e.g., gymnastics, dance), in weight-class sports (e.g., rowing, judo), and endurance sport types (e.g., cycling, long distance running). As Norway is a Northern European country with comparable cultural values and habits as the Netherlands, it is not unlikely that the prevalence of eating disorders is quite similar in the Dutch population.

A second group of sport participants that could be designated as at-risk for eating disorder development is that of individuals who participate in sport out of weight-related motivation. Several studies in non-sport fitness and exercise activities have found that the presumed positive effects of sport participation, such as mood benefits, body satisfaction and higher self-esteem, tend not to be experienced by individuals who are motivated to exercise for weight control or appearance-related reasons (e.g., Hubbard, Gray & Parker, 1998; Strelan, Mehaffey, & Tiggemann, 2003). Van Engelen (2000) showed that no less than 70% of female visitors of Dutch fitness centers agreed that they exercised just because they want to lose weight. So far, no studies have been executed about the presence and consequences of weight-related motivation in general sport activities outside "the exercise arena".

The previous studies made clear how immense eating disorder symptomatology in the athletic population seem to be. The current thesis aims at broadening our understanding of eating disorders in at-risk groups of women athletes. Central question that arises here is: "Why do certain athletes have an increased risk for eating disorder symptomatology?" Underlying issue is whether their eating disorder symptoms would also have developed when they would not have had their athletic career (Sundgot-Borgen, Skarderud, & Rodgers, 2003). When comparing the numbers of elite women athletes with non-athletes suffering from eating disorders, it is tempting to think that for many athletes it would not and, subsequently, that it is probably their athletic participation that somehow caused their eating disorder. In that case, it is important to explore several aspects from the context of sport that influence eating problems in athletes. Women athletes appear to be more vulnerable to eating disorder symptoms because of certain task and socially related sources of stress associated with athletic competition in general and competitive demands and beliefs about low body weight and improved performance in particular that encourage athletes to turn to unhealthy eating and weight control (Hausenblas & Carron, 1999;

McNulty, Adams, Anderson, & Affenito, 2001; Sundot-Borgen, 1994; Torstveit, Rosenvinge, & Sundgot-Borgen, 2008). On the other hand, it could also be questioned whether individuals with eating problems or psychosocial problems that increase the risk of eating disorders, are drawn to certain sports (Brownell, 1995). In this case, one possible explanation might be the use of compulsive (weight-related) exercise which remains often unnoticed because it is interpreted as dedicated physical training that is highly appreciated and often even stimulated in society and sport (Brownell, 1995). Another explanation that stems from outside the sport context can be found in individual personality characteristics, for example perfectionism, that might have stimulated athletes to choose and excel in certain sports but also placed them more at risk of developing an eating disorder (Brownell, 1995; Thompson & Sherman, 1999). In short, for understanding the phenomenon of eating disorders in athletes, distinguishing between the contexts of daily life and sport seems important, and subsequently the question in this thesis should be rephrased to: "How do the daily life and athletic contexts together explain the heightened vulnerability of certain athletes to the development of eating disorder symptoms?"

A variety of factors from the contexts of daily life and sport seems relevant in understanding eating disorder symptomatology in athletes. From the previous, it already appeared that level of sport participation, type of sport, and weight-related motives for athletic participation all seem to play a role here. The same goes for certain personality characteristics making individuals susceptible in addition to environmental influences that are responsible for this vulnerability becoming a reality for some athletes (Brownell, 1995). Other variables that were put forward as risk factors or correlates of eating disorder development are: genetic make-up, gender, ethnicity, elevated weight concerns and dieting, negative self-evaluation, sexual abuse and other adverse life events (Jacobi et al., 2004). After all, eating disorders can be taken as a "biopsychosocial' phenomenon" in which various biological, psychological, social risk factors can be distinguished (Bulik, Slof-Op 't Landt, Van Furth, & Sullivan, 2007). In this introduction, a number of themes and possible influences are presented that are elaborated in the current thesis, such as the role of body image in general, and athletic versus daily life body images in particular, the concepts of weight-related motivation and achievement motivation, the weight-related demands of sport participation and subsequent beliefs about the links between low weight and performance, as well as sports environmental influences such as peer and coach pressure.

Eating problems in sport: Disordered eating and anorexia athletica

It has become apparent that so-called sub-clinical eating disorders appear to be more common among athletes as they often do not meet the exact criteria for clinical eating disorders (Jacobi et al., 2004; Sundgot-Borgen & Torstveit, 2004). Due to their more lean and athletic body, for example, the athletes' body mass index is relatively higher, so athletes subsequently do not easily meet the underweight diagnostic criteria of anorexia nervosa. Some authors, therefore, prefer to talk about a broader category of disturbed

eating in this context, namely disordered eating, which can be defined as: "A wide spectrum of harmful and often ineffective eating behaviors used in attempts to lose weight or achieve a lean appearance that ranges in severity from restricting food intake to bingeing and purging" (Otis, Drinkwater, Johnson, Loucks, & Wilmore, 1997). Disordered eating refers to a new category of people consisting of so-called symptomatic individuals (Mintz & O'Halloran, 2000) who show fewer symptoms or less severe symptoms than anorexia, bulimia or eating disorders not otherwise specified (Nagel, Black, Leverenz, & Coster, 2000). Others specifically introduced the concept "anorexia athletica", a sub-clinical eating disorder among athletes with sport-specific diagnostic standards (Beals & Manore, 1994; Sundgot-Borgen, 1993), the criteria of which are met by approximately 4% of elite female athletes (Sundgot-Borgen & Torstveit, 2004). Anorexia athletica consists of absolute criteria that must be met in addition to relative criteria that may or may not be part of the athletes' eating disorder symptomatology (Sundgot-Borgen, 1993). One of the relative criteria is the presence of a disturbed body image which is not necessarily part of eating disorder symptomatology in athletes (Sundgot-Borgen, 1993), as opposed to the general population for which there is increasing evidence that body image disturbances almost always precede eating disorders (Gardner, 2001). Theorists have distinguished at least two modalities of body image disturbances, namely a perceptual and evaluative component (Gardner, 2001). Whereas perceptual distortions consist of inaccurate judgments of one's body size, a negative body evaluation refers to body attitude or, more specifically, "dissatisfaction with one's body size, shape or some other aspect of body appearance" (Gardner, 2001, p. 193).

Body image

Schilder (1935; 1978) was the first to acknowledge the concept of body image and defined it as follows: "The picture we form in our mind, that is to say the way in which our body appears to ourselves" (p. 17). His starting point was that body image is dynamic and changes throughout the life span while short-term variations are also possible as a result of changes of mood or clothes, or even the use of instruments that extend the image. Furthermore, body image not only refers to self-perceptions but also to the attitudes an individual holds with respect to his or her body and physical appearance (Carron, Hausenblas, & Estabrooks, 2003). Others talk about body image as body attractiveness (Fox & Corbin, 1989). Body image is conceptualized and measured as a multidimensional construct in which various dimensions are distinguished: perception, attitude, cognition, behavior, affect, fear of fatness, body distortion, body dissatisfaction, cognitive-behavioral investment, evaluation, preference for thinness, and restrictive eating, among others. There is currently no consensus in the literature to the names ascribed to the dimensions, and often different dimensions are given the same name. This confusion is largely due to the fact that there is no agreement on which body image dimensions should be distinguished or the instruments that should be used to measure those (Banfield & McCabe, 2002). In the present thesis, body image was defined as follows: "the mental image a person has of his or her physical appearance, as well as any positive or negative feelings one has about

his or her body shape or size" (Rosen, 1995; Gromel et al., 2001, p. 192). During the research process of this thesis the body image dimensions were extended to the following five: appearance, body shape, weight, fat percentage and muscularity, based on studies about physical self-description and body image in athletes (see Ricciardelli & McCabe, 2000; Richards & Marsh, 2006). Within the concept of body image, actual body characteristics as well as perceived, ideal and social body images can be distinguished (Woertman, 1994) referring to actual objective characteristics, subjective perceptions and evaluations of these characteristics, desired body ideals, and perceived opinions of others about one's own body, respectively.

Body image in athletes

In athletes, studies about the influence of body image on eating disorder symptomatology have come up with conflicting results. While some authors found that body image disturbances contributed to patterns of disordered eating in athletes (Beals & Manore, 1994; Berry & Howe, 2000; Byrne & McLean, 2002; Williamson et al., 1995), others found that athletes dieted despite being relatively satisfied with their body. Ziegler et al. (1998), for example, concluded that the dieting behaviors of junior figure skaters did not appear to be associated with perceptions of being overweight nor with a negative body image, contrary to the standard belief that a negative body image and dieting are causally linked. Torstveit et al. (2008) reported that while competing in leanness sports was associated with more clinical eating disorders, fewer athletes in leanness sports than in non-leanness sports were dissatisfied with their bodies. In a meta-analysis of 34 studies on eating problems in female athletes, Smolak et al. (2000) replicated the atypical combination of a high drive for thinness and a low rather than a high score on body dissatisfaction in athletes, and subsequently proposed that eating problems in athletes might differ from that in non-athletes, in particular regarding the role of body image.

All studies mentioned above that investigated body image and eating disorders or disordered eating in athletes have in common that they did not take into account the body image sensitivity to different contextual conditions. Body image is a dynamic and reactive concept rather than a stable and consistent trait (Schilder, 1935; 1978). Individuals have different opinions and feelings about their bodies in different situations. In this respect, studies have shown that athletes seem to measure themselves with the eyes of others in relation to the predominant body ideal of their sport, as well as to hegemonic ideals in society at large, and that an athletic body image versus a social body image should be distinguished, respectively (Krane, Waldron, Michalenok, & Stiles-Shipley, 2001; Loland, 1999; Russell, 2004). While athletic body image can be defined as the "internal image one has of his or her body and the evaluation of that image within an athletic context" (Greenleaf, 2002, p. 64), social body image refers to body evaluation in the context of daily life. Moreover, it was shown that athletes often experienced transient levels of body satisfaction in these two contexts (Krane et al., 2001; Loland, 1999). In this thesis it is

investigated whether athletes' disordered eating is primarily related to body evaluations in the athletic context, the daily life context, or both.

Weight-related beliefs in sport

Athletes need a certain body build, size, and composition depending on the specific performance requirements, and a minimal body weight and low fat percentage is often needed for success. It was found that most athletes have a functional orientation towards their bodies and interpret their bodies as tools for successful performance (Loland, 1999). Subsequently, it has been suggested that in athletes, in particular in weight-related sport types, it is the athletes' assumption that success is associated with low body weight or fat content, that might lead to weight concerns and subsequent willful attempts to create a negative energy balance (Fogelholm & Hiilloskorpi, 1999; Sherman & Thompson, 2006a). These weight-related assumptions and beliefs were also noticeable in the personal quotes of cyclist Leontien van Moorsel who stated that in order to win she needed to lose weight. Other studies pointed to weight-related pressures of the coach as an explanation for the high disordered eating prevalence in athletes (Berry & Howe, 2000; Sundgot-Borgen, 1994a). Anecdotal evidence showed that comments and weight-related pressures by trainers, coaches, or other sports personnel were pointed out as an important trigger factor in the development of their eating disorder (Sangenis et al., 2005; Sundgot-Borgen, 1994a). In addition to the athletes and the coaches, another important influence seems to be coming from peers (Sangenis et al., 2005; Hausenblas & Carron, 2001). Both negative and positive influences have been reported, ranging from competitions in terms of thinness, unhealthy role modeling, or more direct negative comments and weight-related pressures to supplying dietary support or some kind of psychological encouragement in body experiences, normal eating and healthy exercise behaviors. In this thesis I will try to get empirical support for the proposed sport-specific suggestions that weight-related beliefs among athletes themselves as well as the influence of significant others such as coaches and peers, are plausible explanations for athletes' dieting behaviors.

Achievement motivation

Within the sport context, the desire for performance enhancement among athletes and coaches is quite manifest. Although it may seem obvious what it means to perform well in sports, it turns out that definitions of success can be very different (Roberts, 2006). Whereas some see successful performance mainly in terms of winning and outperforming other competitors, for others success depends on their individual achievements irrespective of the performance of others. These different perspectives on success are identified in achievement goal theory (Nicholls, 1984; 1989), which has been a central framework within sport psychology over the past 20 years (Roberts, 2006). In addition to these more dispositional goal orientations towards success, achievement goal theory also distinguishes amongst situational influences on the perception of success, labeled as the "motivational climate" created by coaches and/or parents. Given the apparent link in sport

between disordered eating and a drive for performance enhancement, it seems obvious to investigate the possible role of achievement motivation in athletes' disordered eating.

The present thesis

In this thesis, three different studies were conducted. The first research project encompassed different themes that were captured in three separate manuscripts and chapters in the present thesis. This study included 17 elite gymnasts, 52 non-elite gymnasts, 45 female dancers, and a control group of 142 adolescent schoolgirls, who completed self-report measures of dieting behaviors (Bulimia Test-Revised [BULIT-R]; Thelen, Farmer, Wonderlich, & Smith, 1991) and multiple dimensions of body image (Woertman, 1994), the Contour Drawing Rating Scale (Thompson & Gray, 1995), in addition to measurements of weight-related beliefs of athletes, coaches, and peers, in this study referred to as "weight-related causal attributions of success and failure" and "perceived weight-related peer and coach pressure", respectively. Moreover, questionnaires were included to measure goal orientations (TEOSQ; Duda & Whitehead, 1998), the perceived motivational climate (PMSCQ; Seifriz, Duda, & Chi, 1993), and general personality characteristics such as perfectionism (subscale of EDI-2; Garner, 1991) and self-esteem (RSES; Rosenberg, 1989). In Chapters 2, 3, and 6 different themes and samples of participants from this first study were included. In a second quantitative study (Chapter 4), the influence of body image in daily life versus in sport on athletes' disordered eating was studied by completing the constructed Contextual Body Image Questionnaire for Athletes (CBIQA) in a sample of 19 high performance women athletes with disordered eating and 33 athletes without disordered eating who were screened with the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994). In the third qualitative study (Chapter 5), six interviews were held with (former) high performance women athletes that I have met or worked with during my sport psychological counseling activities and who suffered from an eating disorder or disordered eating at that time.

In Chapter 2, we studied the relationships between sport participation, body image and weight control in a general sample of 140 Dutch adolescent girls between 13 and 18 years old. As previous studies have shown that the presumed mental benefits of sport participation tend not to be experienced by exercisers who were motivated by body-related reasons, it was studied whether these relationships would also be found in a general sample of younger and older adolescent girls who mainly participated in sport activities outside fitness centers. More specifically, it was investigated if weight-related sport participants exhibited more dieting and weight control behaviors, and had a more negative body image and lower self esteem than not-weight-related sport participants or girls who did not participate in sport. With this study, a base-line could be determined regarding dieting and body image-related problems in the general Dutch female adolescent population.

In Chapter 3, the body image-dieting relationships were studied in 17 elite gymnasts and 51 non-elite gymnasts in addition to a control group of 85 schoolgirls who participated in non-elite, merely recreational non-aesthetic sports. It was investigated whether gymnasts were more at risk for disordered eating than non-gymnasts and whether this applied to both elite and non-elite gymnasts. Furthermore, it was studied whether gymnasts' dieting behaviors were related to body image differently when compared to controls, as was suggested by the atypical findings of dieting combined with relatively body satisfaction in athletes in the studies of Smolak et al. (2000) and Ziegler et al. (1998). Central question was whether gymnasts also believe that "thin is beautiful" just like controls, or whether they are rather convinced or persuaded that "thin is going to win?"

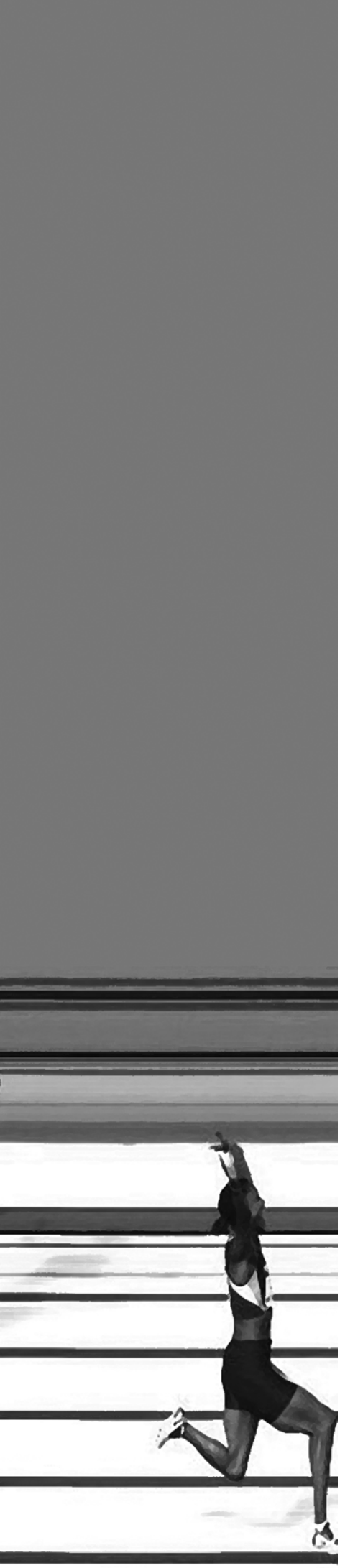
In Chapter 4, the role of body image in athletes' disordered eating was investigated by taking a more dynamic and contextual approach. The study focused on the influence of athletic body image versus body image in daily life on disordered eating in a sample of 19 high performance women athletes with disordered eating and 33 athletes without disordered eating. As existing body image questionnaires are developed for the general population, and, more importantly, consider body image to be a stable and consistent trait, they are not suitable for measuring body image in the athletic context. Therefore, a new questionnaire needed to be developed to measure body image in the contexts of sport as well as daily life. Validation of this Contextual Body Image Questionnaire for Athletes (CBIQA) took place in a general sample of female sport participants and exercisers. Afterwards, it was studied whether the proposed contextual approach was useful, in order words if we would find any differences between the daily and athletic body images, and subsequently, which body image aspect best explained athletes' disordered eating. It was hypothesized that athletic body image would be the main factor in explaining disordered eating variance.

Quantitative studies towards eating disorder risk factors conducted with cross-correlational research designs only permit one to establish statistically significant associations and to assess so called risk correlates. Because it is unclear for many of these risk factors whether they preceded the onset of the eating disorder or not, it is impossible to determine whether they are triggers, symptoms, maintaining factors, or merely consequences of eating disorders (Jacobi et al., 2004). To build our understanding of the development of eating disorders in elite athletes, a qualitative study could provide more rich detail at an individual case level (Byrne & McLean, 2002) and clear up the development process of eating disorders according to the views of women athletes. Therefore, in Chapter 5, a qualitative ethnographic study is described, in which interviews were held with six high performance women athletes who were asked to share their stories on how they have dealt with food in their life and to reflect on which factors from the athletic context as well as daily life had contributed to their disordered eating history. This qualitative study focused on the precipitating, triggering and maintaining factors for disordered eating in the eyes of women athletes and further investigated the contributions

of the contexts of daily life and sport in general, and the interacting influences of body evaluations in both contexts in particular. In sum, in the Chapters 3, 4 and 5 the influence of the multidimensional body image on disordered eating in athletes was investigated, which makes up the core part of this thesis.

Apart from body image, it seems obvious to investigate the possible role of achievement motivation in disordered eating, as disordered eating in sport is linked to athletes' and coaches' drive for performance enhancement. In Chapter 6, the key concepts of achievement goal theory and its relationships with disordered eating correlates has been examined in a sample of high performance women gymnasts and dancers. Ego involvement, whether due to individual orientation, the motivational climate or both, has been linked to several maladaptive behaviors and has also induced both health-related and ethical concerns. Some authors suggested that athletes high in ego orientation may adopt the view that "winning at all costs" is justified and that ego involvement, therefore, would also be more closely related to all kinds of harmful behaviors such as pathogenic weight control (Chi, 2004; Duda, 2001). On the other hand, it was suggested that a mastery climate would have a protective influence on physical and psychological correlates of disordered eating in female gymnasts (Duda, 1999; Duda & Bernadot in Hausenblas & Carron, 2001; Duda & Kim, 1997). These assumptions were tested in a sample of 94 high performance aesthetic performers from gymnastics (n = 59) and dance (n = 35) that was taken from the first study. Finally, Chapter 7 –the Epilogue – summarizes the main findings, its implications for theory and practice and outlines several future research considerations. The goal of the thesis is to provide scientists, applied workers and sports personnel with evidence-based suggestions to improve research and eating disorder-related prevention and treatment programs for athletes.

…"In 1991, the Tour Feminine was scheduled again. And this time I wanted to win. But for that you have to become thinner, I told myself, thinner and sharper. The more weight you will lose, the faster you will climb those mountains. Everyday I trained 6 hours and burned 6000 calories, and I made sure that I would take in no more than 600. I won the Tour just by eating canned beans with baked onions" (Hurkmans, p. 57, translated by De Bruin).
Leontien didn't notice that she became extremely thin. The people around her didn't intervene because she kept on winning. Or they couldn't reach her or were misled. Her teammate, who accompanied Leontien in her weight battle, had already collapsed and terminated her career. At Leontien's all-time low she only weighed 42 kilos, before she finally run out of physical strength and abandoned the cycling pack. Right after that, her weight increased dramatically to 85 kilos. Slowly her body recovered and her motivation to race returned. Back to the top, but with a healthy body this time. A 2-year-battle against her overweight, a mean audience, and slumbering anorexia followed. In 1998 she started to win the fight. In addition to winning the Dutch Championships, she also became World Champion. The Olympic dream rose. Together with her husband she started to prepare for the Olympics in Sydney, where she finally won one silver and three gold medals. During the Olympic Games in Athens she won again, while en passant she had set the world hour record. After Athens she quits. Her illness seems under control now although she thinks that she can never fully recover from anorexia. "I sometimes wonder if I would have had this disease if I would not have participated in elite sports" … (Hurkmans, p. 193, translated by De Bruin).



Chapter 2

Weight-related sport motives and girls' body image, weight control behaviors, and self-esteem

Published as:

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Abstract

Research has shown that exercise for weight control is associated with disordered eating indices in older adolescent or adult exercisers in fitness centers. This study examined whether these relationships could be replicated in a more general sample of 140 Dutch adolescent girls between 13 and 18 years old. Questions about sport participation, items from the multidimensional Body Image Questionnaire and BULIT-R, the Contour Drawing Rating Scale, and Rosenberg Self-Esteem Scale were completed. The girls were categorized as sport-participants with or without weight-related motives or as non-sport-participants. Weight-related sport participation was significantly associated with body dissatisfaction, more weight control and lower self-esteem. In conclusion, it is important to consider motives for sport participation when studying relationships between sport and well being.

Introduction

Although participation in sport and exercise may have various positive effects, such as weight loss, lower body dissatisfaction, fewer eating problems, and higher self-esteem (see Hausenblas & Fallon, 2006; Hausenblas & Symons-Downs, 2001; Loland, 1998), there is also strong empirical evidence that in particular cases it may lead to more eating disorder symptomatology. For example, in aesthetic, weight-class, or endurance sports, particularly when performing at the elite level, more frequent dieting and other disordered eating related symptoms were found (De Bruin, Oudejans, & Bakker, 2007; Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen & Torstveit, 2004). In addition, several studies in non-sport fitness and exercise activities have found that the presumed mental benefits of sport participation tend not to be experienced by individuals who are motivated to exercise for weight control or appearance-related reasons (Ingledew & Sullivan, 2002; Strelan, Mehaffey, & Tiggemann, 2003). So far, research has been limited to regular exercisers inside fitness centers only, and older adolescent or adult samples primarily coming from Australia (e.g., Furnham, Badmin, & Sneade, 2002; Strelan et al., 2003), UK (e.g., Ingledew & Sullivan, 2002), or US (e.g., Hubbard, Gray & Parker, 1998; McDonald & Thompson, 1992).

The aim of the present study was to investigate whether the established relationships between weight-related exercise motivation and the above mentioned disordered eating correlates could be replicated in and generalized to a more general sample of female adolescent sport participants outside the area of fitness centers. In a sample of Dutch adolescent girls between 13 and 18 years of age, sport participants who were motivated by weight-related reasons were compared with sport participants who were not motivated by weight-related issues and girls who did not participate in sport. Possible differences were examined on relevant variables such as dieting and weight control behaviors, body image and self-esteem.

Previous research has shown that exercising to lose weight is a common practice, and that weight loss is one of the main reasons cited by women but not by men for engaging in physical activity (McDonald & Thompson, 1992; Silberstein, Striegel-Moore, Timko, & Rodin, 1988). These gender differences are already present in adolescence, as girls aged 16-18 years exercised more for weight loss, while the boys' reasons for exercising were largely related to physical fitness (Furnham et al., 2002).

Exercising for health, fitness, or enjoyment, also referred to as functional exercising, has been associated with a decrease in overall eating disorder symptomatology and improved body satisfaction (DiBartolo & Shaffer, 2002; Tiggemann & Williamson, 2000). In contrast, so called body-related exercising for weight loss, body tone, or attractiveness has been shown to be related to disturbed eating, body dissatisfaction, and lower self-esteem (Cash, Novy, & Grant, 1994; McDonald & Thompson, 1992, Silberstein et al., 1988;

Smith, Handley, & Eldredge, 1998; Strelan et al., 2003; Tiggemann & Williamson, 2000). Hubbard et al. (1998) concluded that female exercisers who exercise particularly for burning calories or losing weight indicated the greatest disturbance on these areas.

A limitation of the studies above is that mainly adult or undergraduate student samples were studied. Tiggeman and Williamson (2000) who investigated exercisers between 16 and 60 years old only found significant negative relationships with body satisfaction and self-esteem for the group of younger women below 21 years, suggesting that girls and women between 16 and 21 years of age are an important target group in investigating body image-related issues. Furnham et al. (2002) focused explicitly on adolescents of 16-18 years old and found that body-related exercising appeared to be a significant predictor for body dissatisfaction and disturbed eating in this population. Since the physical self-concept scores of Norwegian girls went down dramatically in the transition from elementary to secondary school (Klomsten, Skaalvik, & Espnes, 2004), it seems particularly important to also focus on younger female secondary school students below 16 years of age.

A second limitation of the studies cited above is that they only included regular exercisers inside fitness centers, a limited and possibly selective sample. Generally more body-related motives are found in these so-called "non-sport fitness activities" (Frederick & Ryan, 1993) that are typically practiced to become in shape, referring to both physical condition and, more importantly, to an aesthetic proportionality of body fat and muscularity (Van Hilvoorde, 2008). Moreover, fitness centers can be seen as environments containing a large number of objectifying features such as mirrors and revealing clothing, and reflecting a body culture that is characterized by an increased focus on bodily appearance, interpersonal comparisons, and observations (Prichard & Tiggemann, 2005; Sassatelli, 1999; Strelan et al., 2003). According to Objectification Theory (Frederickson & Roberts, 1997), being exposed to these kinds of body objectification will result in self-objectification, as women and girls gradually internalize this observer's perspective and see themselves as "an object" for others to view and evaluate on the basis of their appearance. Women and girls high on self-objectification are also more likely to exercise for body-related motives and to have a reduced body satisfaction and self-esteem (Strelan et al., 2003). However, as it was unclear whether attending fitness centers caused self-objectification or that it was merely a result, Strelan et al. (2003) recommended investigating the experiences of other populations, such as women whose exercise outlet is primarily playing sport and who may not experience the same degree of body objectification.

Furthermore, nearly all conducted research in this area has been executed in non-European countries. These American (Nowak, 1998; Silberstein et al., 1988; Wardle, Haase, & Steptoe, 2006) and Australian studies (Middleman & Durant, 1996; Middleman, Vazquez, & Durant, 1998) point towards high percentages of adolescent women who worry deeply

about weight and body image issues, attempting to lose weight by exercise or other methods. A validation study for the Dutch version of the Eating Disorder Inventory provided us with some data about eating disorder symptomatology in a Dutch sample compared to a North-American sample, indicating lower scores for Dutch high school girls on body dissatisfaction and a lower drive for thinness in Dutch college girls (Van Strien & Ouwens, 2003). Cross-cultural European research concluded that preoccupation with weight seemed to be less prevalent in the Netherlands even in comparison to other, more central or southern parts of Europe (Waldherr, Favaro, Santonastaso, Van Strien, & Rathner, 2008). Nevertheless, in the Netherlands, as in most countries, the prevalence of overweight and obesity in children and adolescents is increasing rapidly (Hirasing, Fredriks, Van Buuren, Verhoove-Vanhorick, & Wit, 2001). Public authorities in all Northern European countries have increased their focus on risk factors for and consequences of overweight, giving people the message that they need to watch their weight or that they should lose weight. Possible consequences of this increased focus related to the prevalence of eating disorder symptomatology are not known (Torstveit, 2004). In sum, it seems justified to conclude that cultural differences exist in this area (Van Strien & Ouwens, 2003) and that a diversity of cultural samples should be studied.

The present study, therefore, focused on the relationships of motivation for sport activities with body image, dieting behaviors, and self-esteem in a more general sample of Dutch female secondary school students between 13 and 18 years old. Weight-related sport participation, primarily for reasons of burning calories or weight control became the main focus of our study as Hubbard et al. (1998) found that these weight-related motives were linked to the greatest disturbance with regard to eating, body satisfaction, and self-esteem. The variables body image dissatisfaction, weight concerns, and actual dieting behavior are known as important risk factors of eating disorders (Jacobi, Hayward, Zwaan, Kraemer, & Agras, 2004; Shisslak & Crago, 2001); consequently, they are included in the present study. Body image is seen as a multidimensional concept (Gardner, 2001) where body image dissatisfaction refers to "dissatisfaction with one's body size, shape or some other aspect of body appearance" (Gardner, 2001, p. 193). This makes clear that a range of measures is needed to cover the various body image dimensions. Individuals with a negative body image often worry about their weight, are afraid to gain weight and therefore diet more often (Killen et al., 1996). Exercise for weight control is an increasingly popular dieting method in this respect, particularly among female adolescents (Middleman & Durant, 1996; Middleman et al., 1998; Nowak, 1998).

When participants are actually overweight and display a higher body mass index (BMI), participating in sport for weight-control could be considered more healthy and appropriate than when normal or underweight individuals display a weight-related motive for their sport activities. As BMI is a predictor of adolescent women's desire to reduce weight (Ingledew & Sullivan, 2002) and also relates to body satisfaction, eating attitudes, dieting, and exercise (Crissey & Crissey Honea, 2006; Furnham et al., 2002; Hausenblas & Fallon,

2006; Middleman et al., 1998; Torstveit, 2004), it may confound our research findings. A higher BMI may result in a higher dissatisfaction with one's body, more dieting and possibly a higher prevalence of disordered eating, as well as more weight-related exercise. To adjust for actual body composition when examining associations between body image and sport, BMI was taken as a covariate in our analyses. To be able to control for other possible confounding effects as well, the groups were also compared on the demographic background variables educational level and age, and the sport-specific variables sport type, level of sport and hours of sport participation with chi-square analyses (education, sport type, sport level) or one-way analyses of variance (ANOVAs) (age, BMI, sport hours). An increased age, for example, could account for some of the increased prevalence of disordered eating indices due to the simple fact that older girls have been exposed to certain risk factors for a longer period (Torstveit, 2004). When differences were found between the sub groups on these demographic or sport-specific variables (see section Results), those variables were taken as covariates to control for potentially confounding effects. Several (ANCOVAs) were, therefore, used to analyze the dependent variables weight characteristics, multidimensional body image, dieting and weight control behaviors, and self-esteem, while age and BMI were taken as covariates.

Post-hoc contrast analyses were done with weight-related sport participants contrasting not-weight-related sport participants and non-participants. In line with the exercise studies discussed above, we hypothesized that girls participating in sport out of weight-related motives would have a more negative body image than sport participants with not-weight-related motives, or than girls not participating in sport. In addition, we expected the first group to report significantly more dieting and weight control behaviors, as well as a lower self-esteem. In sum, the first hypothesis was that girls participating in sport out of weight-related motives would have a larger relative weight discrepancy, a higher score for perceived shape (read: more fat), a larger body figure discrepancy score, and a lower (read: more negative) perceived body appearance and face appearance than not-weight-related sport participants and non-participants. The second hypothesis was that weight-related sport participants would report a higher dieting frequency, a higher weight control index score and higher purge index score than not-weight-related sport participants and non-participants. The third hypothesis was that weight-related sport participants would score lower on self-esteem than sport participants with not-weight-related motives, or than girls not participating in sport.

Methods

Participants

Participants were 140 girls, ranging in age from 13-18 years, from two schools for secondary education in the centre of the Netherlands. From these schools several classes and different levels of the Dutch education system were included. The mean age of the girls was 15.3 years (*SD* = 1.1).

Procedure and ethics

The participants were approached through their teachers, who asked them to participate as a non-athlete control group in a larger study on the effect of elite aesthetic sport participation on body image and dieting. Part of this sample of 140 female adolescent schoolgirls acted as the control group in a larger study where they were compared with elite and non-elite gymnasts on dieting and body image (see De Bruin et al., 2007).

The girls were told that participation was voluntary and strictly anonymous; everyone agreed to participate. Written informed consent was obtained from the girls and their parents. Data collection occurred in the classroom with only the researcher (first author) present in order to give all the pupils similar instructions, to answer questions and to reduce any influence of the teachers. It took the participants approximately 30 to 40 minutes to fill in the questionnaires. Two questionnaires were incomplete and excluded from the present study. The research design was reviewed and approved by the Ethics Committee of the Faculty of Human Movement Sciences at the VU University Amsterdam.

Measures

The following questionnaires were included in the present study:

Sport participation

The girls were asked to report the main and side sports in which they participated. They were explicitly instructed to think about sport participation in their leisure time and not to include the compulsory physical education lessons at school. Afterwards, the sports were categorized into technical, endurance, aesthetic, weight class, ball-game sports types, and non-sport fitness activities, as this classification has previously been used when investigating disorder eating (see Sundgot-Borgen & Torstveit, 2004). In endurance sports, such as cycling, track-and-field middle, and long distance running, and outside exercising on one's own such as jogging or rollerblading, the main focus is on aerobic endurance training, while sports with weight-class requirements (e.g., judo, lightweight rowing) were classified as weight-class sports. In aesthetic sports, for example gymnastics and dance, thinness and leanness are considered to be important and the most important aspect is the subjective evaluation by judges of competitive or artistic performance. Non-sport fitness activities included all exercise activities within fitness centers, such as fitness, aerobics, and steps. In addition, participants had to report the level of sport participation (elite, non-elite competitions, or recreational) and the amount of time (in minutes) spent on weekly training, and competition. Finally, the participants were asked if they had ever exercised or participated in sport with the specific purpose of burning extra calories or controlling weight, and if so, how often this occurred in the past three months. The sport participants were then categorized into two subgroups, namely sport participants with a weight-related sports motive, from now on referred to as weight-related sport participants,

and not-weight-related sport participants. Following Hubbard et al. (1998), weight-related sports motive was defined as sport participation or exercising with the specific purpose of burning extra calories or controlling weight, on a regular base (at least once a week) in the past three months (see Hubbard et al., 1998; Mond et al., 2004). The criterion of weekly frequency was added, because we only wanted to include those girls for whom weight-related sport participation was an important, recent, and repetitive activity rather than just a single one-time or past occurrence into the sub group of weight-related sport participants. Those who reported weight-related sport activities less than once a week in the past three months and, as a result, did not meet the weekly criterion were included in the group of not-weight-related sport participants.

Participant weight characteristics

Participants were asked to report their current height (in cm) and weight (in kg). With the self-reported height and weight figures, BMI (weight in kg / height in m^2) was calculated. In addition to the actual weight, participants were asked to report their desired (ideal) weight (in kg). Relative "weight discrepancy" (WD) was computed by subtracting the actual weight from the ideal weight, divided by the actual weight and multiplied by 100 (De Bruin et al., 2007).

Body Image

Body image was measured with the short version of the multidimensional "Body Image Questionnaire" which has been used in various samples of adolescents and adults (Woertman, 1994). This self-report questionnaire is designed to assess the perceived and social components of the image of the face and body, consisting of items that were measured on a 9-point Likert scale or with report marks on a 10-points scale ranging from 1 (*very bad*) to 10 (*excellent*) (see Appendices). In the present study, the factor analysis was performed by means of principal component method of extraction with Kaiser's criterion (Eigenvalue over 1) and varimax rotation. One analysis was carried out on ten items measuring perceptions of one's own body and face (perceived component) as well as the perceived opinion of other girls and boys (social component). The data were considered to be suitable for factor analysis as the correlation matrices showed multiple correlations of $r = .3$ or higher, the Bartlett's tests of sphericity were significant at $p < .05$, and the Kaiser-Meyer-Olkin values exceeded the recommended value of .6 (Kaiser, 1970; 1974 in Pallant, 2005). The analysis revealed the presence of two components, explaining 76% of the total variance of body image, with all appropriate items clearly loading on the accompanying factor with values of .73 or higher, replicating the original results (Woertman, 1994). The components "perceived facial appearance" and "perceived body appearance" were identified, both running from negative to positive and both consisting out of five items. Scores were obtained by dividing the sum of the item-scores by the total number of items on the scale. In addition, several reliability analyses were performed to determine internal consistency in Cronbach's alphas of the scales. Cronbach's alpha coefficients were .90 for "perceived facial appearance", and .93 for "perceived body

appearance". In addition, one separate 9-point Likert-item measured perceived body shape from 1 (*too thin*) to 9 (*too fat*). According to test instructions, a score of five should be regarded as being satisfied, while a score above five would indicate perceiving oneself as too fat and below five as too thin. Correlation between this item "perceived body shape" with relative WD was strong with $r = -.67$, $p < .001$.

Body Dissatisfaction

One of the most widely adopted valid measures of body dissatisfaction is the discrepancy obtained by measuring how individuals perceive their actual body shape compared to their idealized body shape. Several versions have been described of figural stimuli scales that range in discrete number of figures between five and 12 (Gardner, 2001); in the present study five figures of the Contour Drawing Rating Scale were selected (Thompson & Gray, 1995). Participants were asked to choose the figure "they think they are" (actual body shape) and the figure "they would like to be" (ideal body shape). Larger differences between participants' actual and ideal body-shape indicated greater body dissatisfaction (DiBartolo & Shaffer, 2002); the score zero indicated that no Body Shape Discrepancy (BSD) was found, while a negative score meant girls desired a thinner body. Correlation between this BSD score with the item "perceived body shape" of the multidimensional Body Image Questionnaire was strong with $r = -.71$, inspiring confidence in using this one item.

Weight control behaviors

First, the frequency of dieting and other weight control behaviors was measured on a 9-point Likert-scale, running from 1 (*never*) to 9 (*always*) (Woertman, 1994) with the following item: "Are you trying to lose weight?" (Wardle et al., 2006; Woertman, 1994) from now on abbreviated and referred to as 'dieting frequency' (see also De Bruin et al., 2007). Second, five items of the Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991) provided specific information on the use of the following weight control behaviors: exercising in order to burn calories, fasting/strict dieting, self-induced vomiting, use of diet pills or diuretics, and use of laxatives or suppositories (see Appendices). Vincent, McCabe, and Ricciardelli (1999) have documented validity data among adolescent girls and report good reliability and adequate concurrent validity of the BULIT-R. Factor analysis on these weight control behaviors in the present study showed that self-induced vomiting, diuretics/diet pills, and laxatives/suppositories loaded together on one factor, clearly representing a common underlying theme of purging methods that are commonly used in order to lose weight very rapidly. These results are consistent with what is theoretically known about eating disorders and also confirm what is found in other studies (Engel et al., 2003). Subsequently, a "purge index score" was constructed (Engel et al., 2003), by adding the number of purging methods the girls had used, varying from zero to three. In spite of its Cronbach's alpha of .70, the purge index was retained because the lower internal consistency may be readily explained, as in practice using one purging method will not always be accompanied by another one. In addition to the purge index, a

total weight control index score was constructed by adding up the number of all weight control methods ever used (see De Bruin et al., 2007), which varied from zero to five. Correlation between this weight control index score and one-item measure "dieting frequency" was strong with $r = .65$, $p < .001$.

Self-Esteem

Self-esteem was measured with the Dutch translation by Van Son (Woertman, 1994) of the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1989). The original sample for which the scale was developed in the 1960s consisted of high school juniors and seniors. Ten items measure self-acceptance and self-worth, and are rated on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Scoring procedures are generally executed one-dimensionally by adding up all items, which was followed in the present study with scores ranging from 10 to 50. A higher score means more self-esteem. The scale generally has high reliability: test-retest correlations are typically in the range of .82 to .88, and Cronbach's alphas for various samples are in the range of .77 to .88 (Blascovich & Tomaka, 1993), and was .85 in the present study.

Results

Regarding sport participation, 24 out of 140 girls (17.1%) reported no participation in any sport, while 116 girls (82.9%) indicated to participate in sports; 51 of them (36.3% of the total sample) practiced more than one sport. The most reported sports were dance, field hockey, non-sport fitness activities, volleyball, tennis, and jogging; ball games and aesthetic sports turned out to be the most popular sport types. A total of 40 girls were classified as weight-related sport participants, as they were physically active with the specific purpose to burn extra calories or control their weight at least once a week in the past three months. In sum, the girls were categorized into three groups: 24 non-participants (17.1%), 40 weight-related (28.6%) and 76 not-weight-related (54.3%) sport participants (see Table 2.1).

While no significant differences were found on the chi-square analysis of the educational level of the three groups, χ^2 (4, N = 140) = 5.518, p = .164, the one-way analyses of variance (ANOVAs) showed significant differences in age, $F(2, 137) = 5.689$, $p < .01$ (see Table 2.1) and BMI, $F(2, 134) = 7.480$, $p < .01$ (see Table 2.2). Post hoc analyses showed that weight-related sport participants were slightly older and had a higher average BMI (M = 21.3; SD = 2.6) than the not-weight-related participants (M = 19.5; SD = 2.4) and non-participants (M = 19.7; SD = 1.7). Subsequently, age and BMI were taken as covariates in subsequent analyses. Furthermore, the subgroups weight-related and not-weight-related sport participants were compared on several sport-related variables; chi-square analyses of sport type and level of participation were used in addition to an ANOVA of the weekly time they participated in sports. Although it seemed as if more weight-related sport participants chose non-sport fitness activities as their main sport than not-weight-related

sport participants, the difference did not reach the p < .05 significance level (see Table 2.1), χ^2 (4, N = 116) = 8.507, p = .075. Finally, no significant differences were found on the level of sport participation χ^2 (2, N = 114) = 5.031, p = .081, nor in weekly time spent on sport activities, F(1, 112) = 1.1, p = .296.

Table 2.1 Characteristics Sport Participation and Background (percentages or Standard Deviation)

	Non Participants (n = 24)	Not-Weight-related (n=76)	Weight-related (n = 40)
Average age (in years)	15.17 (.82)*	15.13 (1.11)*	15.78 (.89)
Average training hours	0	4.1 (3.36)	3.46 (2.6)
Main sports [a]:	-		
Endurance	-	10 (13.2%)	3 (7.5%)
Aesthetic	-	16 (21.1%)	13 (32.5%)
Weight Class	-	8 (10.5%)	4 (10%)
Ball-game	-	37 (48.7%)	12 (30%)
Non Sport Fitness activities	-	5 (6.6%)	8 (20%)
Level of participation:			
elite	-	3 (4.1%)	-
non-elite competitions	-	26 (35.1%)	8 (20%)
recreational	-	45 (60.8%)	32 (80%)

** p < .05; post-hoc comparison with contrast weight-related sport-participants*

[a] No significant differences were found on the chosen type of main sports between weight-related and not-weight-related sport participants. Also, when participation in non-sport fitness activities was compared with the other sport activities combined, no significant differences were found, χ^2 (1, N = 116) = 3.491, p > .05

To test our hypotheses, the main dependent variables were analyzed with several one-way analyses of covariance (ANCOVAs) with age and BMI as our covariates. In Table 2.2, the average scores of our main dependent variables are shown. With respect to the first hypothesis, where we expected differences on the body image measures, significant overall group effects were found on perceived body shape, F(2, 131) = 5.487, p < .05, body figure discrepancy, F(2, 129) = 4.638, p < .05 and perceived body appearance, F(2, 123) = 4.998, p < .01, while no significant group effects were found on relative weight discrepancy, F(2, 125) = 1.551, p = .216 and perceived face appearance, F(2, 120) = 1.258, p = .288. Regarding the second hypothesis concerning differences on the measures of weight control, significant differences were found on dieting frequency, F(2, 131) = 15.24, p < .001, weight control, F(2, 132) = 21.106, p < .001 and purging, F(2, 132) = 4.423, p < .05. For the third hypothesis on self-esteem, significant group differences were found as well, F(2, 130) = 4.517, p < .05. Covariate effects were found for BMI on all

variables, *F*s(1, 123-131) > 25.652, *p*s < .001, except for perceived face appearance, *F*(1, 120) = .156, *p* = .693, weight control, *F*(1, 128) = 3.334, *p* = .070, purging *F*(1, 128) = 1.705, *p* = .194, and self esteem, *F*(1, 130) = .078, p = .78. No significant effects were found for covariate age, *F*s(1, 123-132) < 1.744, *p*s > .424. As was expected, it seems that the group of weight-related sport participants scored more negative on the various body image measures, higher on the weight control measures, and lower on self-esteem.

Table 2.2 Average scores on weight characteristics, body image, weight control and self-esteem (Standard Deviation) with covariates BMI and age

	Non Participants (n = 24)	Not-Weight-related (n=76)	Weight-related (n = 40)
BMI	19.73 (1.67)*	19.53 (2.44)*	21.3 (2.6)
Relative weight discrepancy	-2.25 (6.70)	-2.41 (6.70)	-7.26 (5.92)
Perceived body shape [a]	5.61 (1.12)*	5.69 (1.35)*	6.93 (1.43)
Body Figure Discrepancy [b]	-.28 (.69)*	-.32 (.68)*	-.96 (.81)
Perceived body appearance [a]	6.81 (1.07)*	6.34 (1.22)*	5.53 (1.57)
Perceived face appearance [a]	6.46 (1.40)	6.49 (1.02)	6.18 (1.10)
Dieting frequency [a]	2.26 (1.45) *	3.14 (2.41)*	5.65 (1.90)
Weight control index [c, f]	.74 (1.10)*	.47 (.80)*	1.88 (1.09)
Purge index [d]	.22 (.671)	.04 (.259)*	.43 (.813)
Self-esteem [e]	37.59 (6.01)*	37.23 (5.7)*	33.97 (6.4)

Note. When all analyses were repeated without the girls participating in non-sport fitness activities included, similar results were found, Fs(2, 100) > 3.127 , ps < .05

** p < .05; post-hoc comparison with contrast weight-related sport-participants*

[a] Scale (1 - 9) ; for average perceived body and face appearance, scale (1 - 9.2)

[b] Scale (-4 - +4)

[c] Scale (0 – 5)

[d] Scale (0 - 3)

[e] Scale (10 - 50)

[f] When weight-related sport was excluded from the weight control index, similar results were found, F(2, 127) = 6.326, p < .01 with weight-related sport participants scoring higher than not-weigh-related sport participants or non-participants (p < .01, p < .05; η^2 = .091)

To confirm this, post-hoc contrast analyses were done with weight-related sport participants contrasting not-weight-related sport participants and non-participants. Regarding our first hypothesis on body image, the results showed that compared to both not-weight-related sport participants and non-participants, weight-related sport-participants had a significantly larger perceived shape ($p < .01$, $p < .01$; $\eta^2 = .077$), a larger body figure discrepancy ($p < .01$, $p < .05$; $\eta^2 = .007$) and a more negatively perceived body appearance ($p < .05$, $p < .01$; $\eta^2 = .075$). As expected, weight-related sport-participants perceived their body shape as more fat, were more dissatisfied with their body figure and perceived their bodily appearance as less beautiful. Second, as hypothesized, they also reported higher dieting frequency ($p <.001$, $p < .001$; $\eta^2 = .189$),

and had a higher weight control index score ($p < .001$, $p < .001$; $\eta^2 = .242$). Regarding the purge index, weight-related sport participants only significantly differed from not-weight-related sport participants in using more purging methods ($p < .01$, $p = .259$; $\eta^2 = .063$). Finally, confirming our third hypothesis, weight-related sport participants had lower self-esteem than not-weight-related sport participants and non-participants ($p < .01$, $p < .05$; $\eta^2 = .065$).

Discussion

The main purpose of the present study was to examine the relationship between weight-related motivations and disordered eating indices in adolescent girls outside the area of fitness centers. In particular, we investigated the relationships of weight-related sport participation and body image, dieting behaviors, and self-esteem in a general sample of 13-18 years old girls. Our sample included 82.9% sport participants, which is in line with recent statistics of the Dutch population indicating that 86% of the adolescent women between 12-19 years of age participate in sport (Breedveld & Tiessen-Raaphorst, 2006). Other American and Australian studies already concluded that adolescent women worry deeply about weight and body image issues and attempt to lose weight by exercise or other methods (e.g. Middleman & Durant, 1996; Middleman et al., 1998; Nowak, 1998). Indeed, it is during adolescence that girls gain more fat, which takes them away from the lean female idealized body figure (Striegel-Moore, Silberstein, & Rodin, 1986). Our study in a Dutch female adolescent sample seems to confirm these results since 28.6% of the girls were classified as "weight-related sport participants" as they reported regular weekly participation in sport or exercise for weight-related motives. These numbers put in perspective the results of Waldherr et al. (2008) that Dutch girls seem to have the least disordered eating related issues, and show that weight preoccupation among girls in the Netherlands is not just marginally present.

When compared to not-weight-related sport participants and girls not participating in sport, weight-related sport participants were slightly older and had a higher, yet normal and healthy BMI, therefore age and BMI were included as covariates in subsequent analyses. Whereas no significant effects were found for covariate age, significant effects were found on various dependent variables for BMI. In line with our hypotheses, having weight-related motives for sport participation appeared to have several negative associations with body image, dieting behaviors and self-esteem. Even when controlling for actual body composition (BMI) and age, weight-related sport participants perceived themselves as more fat, were more dissatisfied with their body figure, and perceived their body (but not their face) as less beautiful than not-weight-related sport participants and non-participants. In addition, they reported higher dieting frequency, used more weight control and purging methods, and had lower self-esteem.

These results are in agreement with the results from other studies on body-related motivation in older adolescent or adult samples of regular exercisers and fitness participants (e.g., Cash et al., 1994; Ingledew & Sullivan, 2002; McDonald & Thompson, 1992, Silberstein et al., 1988; Smith et al., 1998; Strelan et al., 2003; Tiggemann & Williamson, 2000). It seems that female sport participants in general often have weight-related motives for their sport participation that are accompanied by body dissatisfaction, weight control, and lower self-esteem. It can now be concluded that this is also applicable to younger female adolescents below 16 years of age. Our results seem to underline the importance of motives for sport participation for body image, dieting, and self-esteem that are known for their contribution to the development of either healthy or disordered eating patterns. Consequently, our results emphasize how important it is to take into account the motives for sport participation when studying relationships between sport and well being.

Obviously, we should keep in mind that there is debate in the literature about the validity and reliability of BMI as a measure for the prediction of body fat distribution in younger people due to the rapid bodily changes in adolescence (cf. Kok, Seidell, & Meinders, 2004). In this respect, it is also important to note that in the present study BMI was measured by self-report which holds the risk of underreporting or over-reporting. A review of the literature on the validity of self-reported height and weight in children and adolescents showed that height was often over-reported, whereas weight is more likely to be underreported, leading to an underestimation of the prevalence overweight and obesity (Jansen, van der Looij-Jansen, Ferreira, de Wilde, & Brug, 2006). Goodman, Hinden, and Khandelwal (2000), on the other hand, showed that correlations between measured and self-reported anthropomorphic indices in an adolescent sample were very strong with r = .92 for BMI. Davis (1990) concluded that self-report is more accurate when the anonymity of the respondents is guaranteed, as was the case in the present study. Still, future studies should also aim at replicating our findings with actual measures of anthropometric variables.

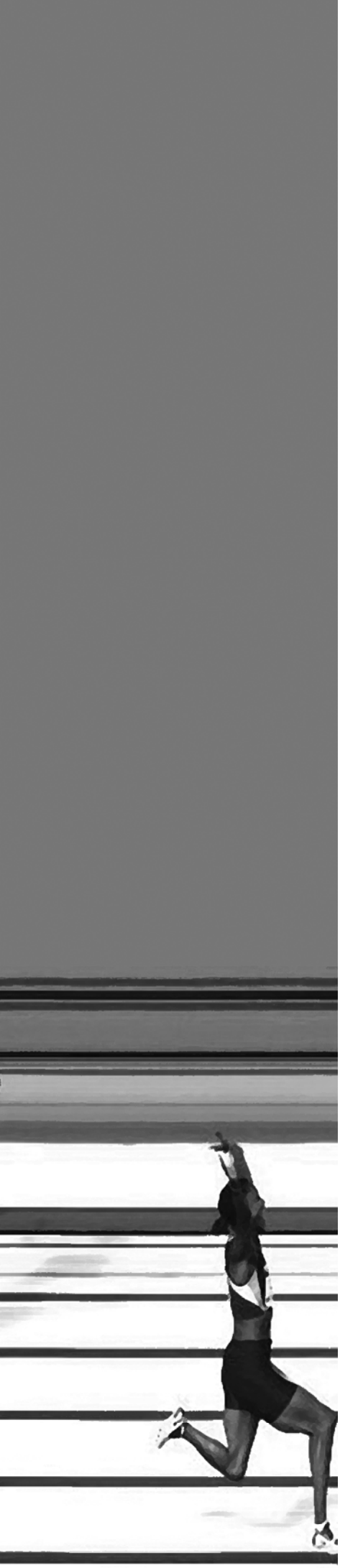
A limitation in the current study was the use of some one-item measures. Yet, this is more common in recent studies investigating eating behaviors (e.g., Harrell & Jackson, 2008), and studies that are part of a larger research project (e.g., Wardle et al., 2006). In the present study, strong correlations existed between our one-item measures with related measures, for example, between the one-item measure of perceived body shape and the body figure discrepancy score of the Contour Drawing Rating Scale, which inspired our confidence in the use of these one-item measures. Needless to say, if possible, future studies should consider using full questionnaires. This also holds for the relatively crude index scores for weight control and purging with a somewhat limited reliability (Nunnally, 1978). In future studies focusing exclusively on relationships between motivation for sport and exercise and disorded eating, a more extensive measure, such as the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994), could be administered which should also lead to improved reliability coefficients (Mond et al., 2004). Future

studies could also incorporate a more extensive measure for the motivation of sport and exercise, such as the Exercise Motivation Inventory-2 (EMI-2; Markland & Ingledew, 1997) that acknowledges the existence of multiple sports motives. In the present study, we just focused on a weight-related motivation, because reasons such as burning calories and weight control appeared to be associated with the greatest disturbance on disordered eating indices (Hubbard et al., 1998). In the subgroup weight-related sport participants, we included only those girls for whom weight-related sport participation was a recent, frequent, and repetitive activity by using the criterion of a weekly frequency. In doing so, it was assumed that we justly excluded the girls to whom other sport motives were more important. By administering the EMI-2 (Markland & Ingledew, 1997) in addition to our dichotomous measure of a weight-related motive, these assumptions could be made more explicit and the relationships between being motivated by weight management and other (more functional) motives would become clear.

It should also be noted that our design was only correlational in nature. Instead of weight-related motives leading to body dissatisfaction which in turn leads to weight control behaviors, it is also possible that girls who are dissatisfied with their weight and body, choose to engage in exercise or sport and other weight control behaviors in order to lose weight. Although it is tempting to think that the latter is perhaps more obvious, the study of Strelan et al. (2003) clearly showed that body-related exercise motives acted as a mediating variable accounting for the reduced body satisfaction and self-esteem of self-objectifying women and girls. Future studies should focus on this issue of causality by investigating the process through which weight-related motives for sport participation exert their influence. Finally, future research could also focus on body-related exercise or sport participation of men, since physical activity to gain weight, strength and/or muscle mass seems common in men, and relationships with phenomena such as muscle dysmorphia, disordered eating and substance abuse are prevalent in certain male populations (e.g., Pope, Phillips, & Olivardia, 2000).

In conclusion, many adolescent girls seemed to choose the sport environment or fitness centers in search for a solution for their alleged overweight. Yet, it should be noted that nearly all girls with a weight-related motive for sport participation had a normal and healthy body composition according to their BMI. However, as associations of weight-related motive with body dissatisfaction and low self-esteem also existed after controlling for BMI, it is very unlikely that these weight-related sport activities will ever be a solution for their unhappiness with themselves. Special attention is warranted for the fact that the girls who exercised for weight control reported having used unhealthy weight control methods such as fasting, self-induced vomiting and the use of diuretics/diet pills significantly more often. These results are in agreement with those of Nowak (1998) who concluded that in weight-conscious girls exercising was accompanied by unhealthy eating patterns. For these girls, sport participation does not seem to translate into increased body image and self-esteem as it does in general populations (Strelan et al., 2003). Seeing that a

weight-related motive for sport and exercise clearly seems to hold a risk for developing psychological problems, even for younger girls from the age of 13 years old, it is important for sport coaches, trainers, exercise instructors, and physical education teachers to identify these girls at an early stage. Shaffer and Wittes (2006) already concluded that sport participation only leads to an increase in self-esteem if the participants enjoy their sports experience. Hence, it seems sensible for coaching and training staff in sports or exercise as well as for policy makers and public authorities to emphasize enjoyment and other, not-weight-related motives for sport participation.



Chapter 3

Dieting and body image in aesthetic sports: A comparison of Dutch female gymnasts and non-aesthetic sport participants

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Abstract

Objectives: To examine the relationship between dieting behavior and body image in female aesthetic athletes.
Methods: 17 elite gymnasts, 51 non-elite gymnasts and a control group of 85 schoolgirls, participating in non-elite, merely recreational non-aesthetic sports, completed self-report measures of dieting behaviors and body image.
Results: After controlling for BMI, the results showed that elite gymnasts dieted more often than controls, although they were not more negative about their body. Furthermore, non-elite gymnasts dieted as much as controls and had a more positive body image. Despite what general theories predict, the gymnasts' dieting was not so much related to a negative body image but rather to weight-related causal attributions or perceived weight-related coach pressure.
Conclusions: Whereas controls believe that "thin is beautiful", gymnasts seem more convinced or persuaded that "thin is going to win". Future research should take into consideration that dieting and body image are likely to be developed differently in the context of aesthetic sports.

Introduction

There is quite some evidence that female athletes are at increased risk of developing eating disorders (Davis, 1992; Hausenblas & Carron, 1999) particularly when they are performing at the elite level (Smolak, Murnen, & Ruble, 2000). Because athletes often do not meet the exact criteria for clinical eating disorders, so-called sub-clinical eating disorders appear to be more common among them. Some authors even introduced "anorexia athletica", a sub-clinical eating disorder with sport-specific diagnostic criteria (Sundgot-Borgen, 1993), or prefer to talk about the broader concept of disordered eating in this context.

The prevalence of eating disorder symptomatology seems to be different in various sports (Fogelholm & Hiilloskorpi, 1999) with significantly more symptoms in athletes in aesthetic, endurance and weight dependent sports than in technical sports, ball games and power sports, or in non-athletes (Sundgot-Borgen, 1993). Problems are mainly found in sports that emphasize leanness, thinness and aesthetic aspects, such as gymnastics, dance, figure skating, synchronized swimming and diving (Byrne & McLean, 2002; DiBartolo & Shaffer, 2002). Particularly young gymnasts are often pointed out as the athletes most at risk (Sundgot-Borgen, 1994a). Pathogenic weight control was used most frequently by gymnasts in comparison to other athletes (Rosen, 1996; Sundgot-Borgen, 1993). Rosen and Hough (1988) found that 62% of the female college gymnasts in their sample used at least one method of pathogenic weight control, such as fasting, self-induced vomiting, or using laxatives, diuretics or diet pills. However, in a recent meta-analysis of eating problems in female athletes, elite gymnasts competing successfully at national or international level or as professional competitors did not significantly differ from non-athletes (Smolak et al., 2000).

Besides research on prevalence there are also a growing number of studies trying to detect so called risk factors for developing eating disorders (see Jacobi, Hayward, De Zwaan, Kraemer, & Agras, 2004; Stice & Whitenton, 2002). A variety of risk-factor models for eating disorders have been proposed, including multiple putative individual, family and socio-cultural risk factors. Factors like body image dissatisfaction, weight concerns and actual dieting behavior are nearly always part of these models (Shisslak & Crago, 2001), and a negative body image is found to be a very potent, well-supported risk factor (Jacobi et al., 2004). Individuals with a negative body image often worry about their weight, are afraid to gain weight and therefore diet more often than persons who have less weight concerns (Killen et al., 1996). In general, body image refers to "the mental image a person has of his or her physical appearance, as well as any positive or negative feelings one has about his or her body shape or size" (Rosen 1995; Gromel et al., 2001, p. 192) and should be considered a multi-dimensional concept (Gardner, 2001), in which actual body characteristics as well as perceived, ideal and social body images can be distinguished (Woertman, 1994).

There is increasing evidence that body image disturbances often precede eating disorders (Gardner, 2001). Two components of disturbance have been distinguished, namely perceptual body-size distortion and a negative attitudinal or affective element. "Perceptual distortion consists of inaccurate judgments of one's body size. The attitudinal component consists of dissatisfaction with one's body size, shape, or some other aspect of body appearance" (Gardner, 2001, p. 193). Both can serve as independent measures to predict eating disorders, although attitudinal measures have more clinical relevance and yield more consistent findings (Gardner, 2001). Among athletes attitudinal body image disturbances also appeared to contribute to patterns of disordered eating and dieting (Berry & Howe, 2000; Fogelholm & Hiilloskorpi, 1999; Williamson et al., 1995).

Because of the presumably higher prevalence of disordered eating in athletes in weight-related sport types and the alleged presence of attitudinal body image disturbances in all individuals with eating disorder symptomatology, a more negative body image among these athletes might be expected. However, a recent meta-analytic review of 78 studies examining the general body image of athletes concluded that athletes have a slightly more positive body image than non-athletes (Hausenblas & Symons Downs, 2001). No differences were found among athletes in aesthetic, endurance and ball game sport types, indicating that even the aesthetic athletes who are most at risk for developing eating disorders, had a more positive body image and were more satisfied with their body. Smolak et al. (2000) proposed that disordered eating in athletes might differ from that in non-athletes after finding an atypical combination of a high drive for thinness and a low rather than a high score on body dissatisfaction in athletes. Similarly, Ziegler et al. (1998) showed that junior elite figure skaters dieted despite being relatively satisfied with their body. In both studies, the athletes' desire for thinness or actual dieting did not appear to be associated with body dissatisfaction. Alternatively, it has been suggested that in weight-related sport types, it is especially the athletes' assumption that success is associated with low body weight or fat content, that might lead to weight concerns and subsequent attempts to reduce weight, either gradually (e.g., by dieting or exercising) or rapidly (e.g., by vomiting) (Fogelholm & Hiilloskorpi, 1999). Other studies pointed to weight-related pressures of the coach as a general explanation for the high prevalence of disordered eating in athletes (see Berry & Howe, 2000; Sundgot-Borgen, 1994b). In sum, the results of Smolak et al. (2000) and Ziegler et al. (1998) dispute common ideas in athletes of dieting, being linked to body dissatisfaction. Instead of the "negative body image explanation", relationships with weight-related causal attributions or coach pressure have been posited as alternative explanations for dieting behavior and disordered eating in athletes.

To get additional support for these proposed alternative explanations, first it is important to replicate the "atypical" findings of Smolak et al. (2000) and Ziegler et al. (1998) in a study that directly compares athletes to non-athletes. Second, evidence needs to be provided for the suggestions that weight-related causal attributions and coach pressure are

alternative explanations for athletes' dieting behaviors. Finally, a more detailed distinction between the several elements of the multi-dimensional body image (such as actual, perceived and desired body weight, body size, body shape, and physical body appearance) is essential to gain more insight into the relationship between dieting and body image in the context of aesthetic sport participation.

Therefore, the present study compares female athletes in gymnastics at elite and non-elite levels (from now on referred to as elites and non-elites) to "average" schoolgirls, participating in merely recreational or low-level competitive non-aesthetic sports (henceforth called controls) on several weight characteristics, dieting behaviors and multiple dimensions of the body image. More specifically, the study focuses on the relationships between dieting and body image. As large differences between gymnasts and controls in Body Mass Index (BMI) can be expected, BMI will be taken as a covariate, since it has been previously found to be related to all variables involved in this study. Nonetheless, it has not always been controlled for in other studies (Ingledew & Sullivan, 2002). In addition, relevant background characteristics such as education and age were taken into account as covariates.

First, it was hypothesized that gymnasts, specifically the elites, would demonstrate more symptoms related to disordered eating than the controls. More specifically, we expected a larger desire for weight loss of the gymnasts, particularly the elites. We also expected the gymnasts, particularly the elites, to show more frequent dieting and pathogenic weight control than controls.

Regarding body image, it was expected that gymnasts would be equally satisfied with their body or even have a more positive body image than controls. Nonetheless, it was uncertain whether this would apply to every dimension, i.e., perceived body shape [too thin-too fat], perceived body size [too small-too large], perceived body appearance [ugly-beautiful] and perceived opinion of others about one's body [negative-positive].

With respect to the relationships between dieting and body image, it was hypothesized that, in line with common ideas, the dieting behavior of controls would be negatively related to their body image. More specifically, we expected that frequent dieting would be related to a higher BMI, to a larger desire to lose weight, to a more negative (read: more fat) perceived body shape, as well as to a more negative (read: less beautiful) perceived appearance. The dimension perceived body size seemed to be less relevant for dieting and was put aside. Furthermore, among controls we expected the weight characteristics and perceived body shape to be negatively correlated with perceived body appearance. This would indicate that the lower their BMI or the thinner their perceived shape, the more controls would perceive their body appearance as beautiful, corresponding with the common idea that "thin is beautiful".

Among gymnasts, we expected to find significant relationships between frequent dieting on the one hand and a higher BMI, and a more fat perceived body shape on the other hand as well, as these results have been found earlier (cf. Berry & Howe, 2000; Davis, 1992). However, no relationships were expected between dieting and perceived body appearance (ugly-beautiful dimension). Furthermore, if dieting is indeed related to weight and shape, but not to appearance, perhaps weight and shape will not be significantly correlated with appearance either, which would indicate that the idea that "thin is beautiful" will not apply to gymnasts. Alternatively, for the gymnasts' dieting we expected positive correlations with weight-related causal attributions of success and failure, as well as with the perceived weight-related pressure of the coach, which would indicate that their dieting behavior fits better with the idea that "thin is going to win".

Method

Participants

Participants were 153 adolescent girls, in the age between 13 and 20 years: 68 gymnasts and 85 schoolgirls (control group). The control group consisted of 85 schoolgirls of two separate secondary schools of which several classes of different levels and types of education were included.

Gymnasts

The group of gymnasts consisted of 17 elites competing internationally and 51 non-elites competing at the national level of competition. The elites spent 21 to 34 hours on training and competition per week, with an average of 29.1 hours (SD = 3.9). The non-elites spent 12.3 hours on average on gymnastics and other sport-activities together (SD = 3.6). The mean age of the elites as well as for the non-elites was 14.9 years (SD = 1.8 and 1.6, respectively).

Controls

The mean age of the controls was 15.4 years (SD = 1.8), significantly different from the non-elites only, $t(134) = 2.11$, $p = .036$. The control group included only non-elite sport participants in non-aesthetic sport types, who participated in lower-level competitions or merely recreational. Their average time spent on sport activities was 3.9 hours a week (SD = 2.6). No significant differences were found in education between the gymnasts and controls, χ^2 (2, N = 152) = 3.185, $p > .05$.

Measures

The present study was part of a larger study that aimed at gaining more insight into several general and sport-specific risk factors of dieting and weight control among aesthetic athletes. In this paper the focus is on multiple aspects of dieting, eating problem-related beliefs, and body image, while the other risk factors will be presented in a different paper.

As a questionnaire that included every aspect we wanted to study was not available in the Dutch language, (already translated and validated) parts of other questionnaires were used or new parts were constructed in cooperation with associated sport psychologists, and experts from the field of gymnastics. An important consideration in the selection process was limiting the total number of items to limit the time required to fill in the questionnaire as much as possible. The following questions and questionnaires were included in the present study:

Participant weight characteristics

Participants were asked to report their current height (in cm) and weight (in kg). Davis (1990) concluded that self-report is more accurate when the anonymity of the respondents is guaranteed, as we did in the present study. With the self-reported height and weight figures, the Body Mass Index was calculated (BMI = weight in kg / height in m^2). In addition to the actual weight, the girls were asked to report their desired (ideal) weight (in kg). Relative weight discrepancy was computed by subtracting the actual weight from the desired weight, divided by the actual weight, and acted as a measure for desired weight loss (or weight gain).

Dieting behaviors

As athletes often do not meet the exact psychological and psychiatric criteria for clinical eating disorders, behavioral measures of dieting and weight control practices were selected. First, dieting frequency was measured on a 9-point Likert scale, running from 1 (*never*) to 9 (*always*) (Woertman, 1994). Second, six items of the Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich & Smith, 1991) measured the use of the following pathogenic dieting and eating practices: exercising in order to burn calories, fasting/strict dieting, self-induced vomiting, use of diet pills or diuretics, use of laxatives, and binge eating (see also Petrie & Stoever, 1993). Validity data among adolescent girls have been extensively documented by Vincent, McCabe and Ricciardelli (1999) who report good reliability and adequate concurrent validity.

Body Image Questionnaire (Short Version)

The Body Image Questionnaire is a multi-dimensional self-report scale designed to measure actual, perceived, ideal and social components of body image. Items were measured on a 9-point Likert scale of which the score five could be regarded as "being satisfied" according to test instructions (Woertman, 1994). Principal component analysis with Kaiser's criterion (Eigenvalue over 1) and varimax rotation showed that three body-related items loaded strongly on one component, supporting the use of a separate scale "perceived body appearance" (from negative to positive), replicating the original results of the scale author in adolescents. Cronbach's alpha coefficient of this scale in this sample was .91. Two 9-point Likert items measured the separate social dimension of body image, in other words the perceived opinion (from negative to positive) of other girls and boys

about one's own body. Additionally, two 9-point Likert items measured perceived body shape (from too thin to too fat) and perceived body size (from too small to too large).

Weight-related causal attributions and coach pressure

Exclusively for the gymnasts, weight-related causal attributions of success and failure were measured with four 5-point Likert-scale items, running from 1 (*totally disagree*) to 5 (*totally agree*). Principal component analysis with Kaiser's criterion (Eigenvalue over 1) and varimax rotation led to the scale "aesthetic-related success attributions" that had an internal consistency of $\alpha = .88$, consisting of three items measuring the attributed importance of respectively one's weight, body shape and physical appearance to success. The fourth separate item measured to what extent they agreed with their (alleged) overweight causing failure.

In addition, weight-related coach pressure was measured by four 5-point Likert-items, again running from 1 (*totally disagree*) to 5 (*totally agree*), asking about the gymnasts' perceptions of the following behaviors of the coach towards the gymnasts in their training group: "Making remarks about weight", "judging on appearance", "urging to diet", and "attributing failure to their weight". Principal component analysis with Kaiser's criterion (Eigenvalue over 1) and varimax rotation led to the scale "weight-related coach pressure", which had a Cronbach's alpha coefficient of .79.

Procedure

In collaboration with the Royal Dutch Gymnastics Union (KNGU), 14 of the 15 coaches working with elite gymnasts at the National Olympic Centers or with non-elites in national gymnastics associations agreed to cooperate. Participants were first approached through their teachers or coaches. They were asked to participate in a study on the effect of sports on body image to avoid selective response as much as possible. They were told that participation was voluntary and strictly anonymous; all the girls agreed to participate. In addition, they were requested to get written parental permission to participate and a written consent from the participants was obtained allowing the researchers to use the data for publication. 85% of the data was collected in the presence of the researcher (first author) in groups during class or after training. 15% of the gymnasts received the test at home or filled in the questionnaire in groups in the presence of the coach after he or she had agreed to stick to the test instructions and privacy principles.

Data analysis

As our only interest was to compare gymnasts (elites and non-elites separately) with controls, a priori simple contrast tests were performed or separate chi-square tests for elites versus controls and non-elites versus controls were conducted. Several chi-square analyses and one-way analyses of variance (ANOVAs) were conducted to test whether gymnasts differed from the controls on the background variables education and age. If

differences were found, these variables should be controlled for to eliminate their possible influence on weight characteristics, dieting behavior and body image. As was stated earlier, non-elites significantly differed from the control group on age. In addition, as expected, significant differences were found on BMI between elites and controls, $t(96) = 2.50$, $p = .014$, as well as between non-elites and controls, $t(130) = 2.19$, $p = .030$. Therefore, age and BMI were taken as covariates.

Average scores, calculated for the 9-point Likert items and scales, were analyzed in GLM univariate analyses of covariance (ANCOVA) to analyze participant weight characteristics, dieting behaviors, and measures of body image, with age and BMI as covariates. Furthermore, chi-square analyses were conducted to analyze differences in the number of participants using the different types of weight control methods.

Finally, Pearson's correlations were computed to examine the relationships between dieting and body image in order to test the idea that a negative body image is related to the controls' dieting, and not to the dieting of gymnasts. In addition, the alternative explanation that "thin is going to win" was tested by computing Pearson's correlations between dieting and weight-related attributions and coach pressure for gymnasts only.

Results

Weight characteristics

In Table 3.1 the weight characteristics (BMI, relative weight discrepancy) of the groups are presented. An ANCOVA on relative weight discrepancy showed a significant effect for covariate BMI, $F(2, 142) = 84.8$, $p < .001$, but not for age ($p = .35$). Furthermore, the contrast analysis on relative weight discrepancy showed that both elites, $t(90) = 2.24$, $p = .027$, and non-elites, $t(124) = 2.15$, $p = .033$, differed from controls. Thus, in addition to their significantly lower BMI, both groups of gymnasts desired to lose more weight than controls.

Table 3.1 Average weight characteristics (Standard Deviation)

	Elite ($n = 17$)	Nonelite ($n = 51$)	Controls ($n = 85$)
BMI current weight	18.44 (1.47)*	19.08 (2.13)*	20.28 (2.77)
Relative weight discrepancy (% of actual weight)	-4.69 (6.35)*	-4.54 (5.80)	-4.39 (5.33)

** $p < .05$*

Dieting behavior

As shown in Table 3.2, the average dieting frequency was the highest for elite gymnasts. An ANCOVA revealed that both BMI, $F(1, 146) = 32.775$, $p < .001$, and age, $F(1, 146) = 6.085$, $p = .015$, had an influence on dieting frequency. The contrast-analyses showed a

significant result on dieting frequency for elites only, $t(95) = 2.85$, $p = .005$, while non-elites did not significantly differ from controls, $t(128) = .60$, $p = .548$.

Table 3.2 Dieting frequency, average number of used methods with and without training (Standard Deviation) and different types of dieting methods used (percentages)

	Elite ($n = 17$)	Nonelite ($n = 51$)	Controls ($n = 85$)
Dieting frequency	4.81 (2.93)*	3.04 (2.6)	4.01 (2.53)
Number of methods used	1.19 (1.22)	.70 (1.07)	.93 (1.12)
Number of pathogenic methods (without training)	.81 (.98)*	.39 (.76)	.45 (.82)
One or more pathogenic methods ever used	8 (47.1%)	13 (25.5%)	27 (32.1%)
Type of method used:			
Training	6 (35.3%)	16 (31.4%)	40 (47.1%)
Fasting	7 (41.2%)	11 (21.6%)	26 (30.6%)
Vomiting	4 (23.5%)	3 (5.8%)	7 (8.3%)
Diet pills	2 (11.8%)	2 (3.9%)	6 (7.1%)
Laxatives	0 (0%)	3 (5.9%)	1 (1.2%)
Bingeing	7 (41.2%)	18 (35.3%)	34 (40.5%)

*$p < .05$

Table 3.2 also presents the several methods that were used to lose weight. The average number of methods used did not significantly differ among the groups ($p = .209$), but significant effects were found for both covariates BMI ($p = .023$) and age ($p = .009$). When the method "training" was removed, as exercise with the specific purpose to lose weight should probably be interpreted differently (and perhaps be taken as healthier) for controls than for the more intensively training gymnasts, a significantly difference in the average number of pathogenic methods used was found for the elites-controls contrast, $t(130) = 2.32$, $p = .022$. Zooming in on the percentages of girls that have used these methods, 47.1% of the elites used one or more pathogenic methods like fasting, vomiting, use of diet pills, diuretics or laxatives, 25.5% of the non-elites and 32.1% of the controls admitted doing so. Chi-square analyses yielded only a very mild trend that elites have used self-induced vomiting more often (23.5%) than controls (8.3%), χ^2 (1, $N = 101$) = 3.364, $p = .086$. Another trend was found for training, but in the other direction: this method was practiced more by controls (47.1%) than by non-elite gymnasts (31.4%), χ^2 (1, $N = 136$) = 3.238, $p = .072$.

Body Image

In Table 3.3, the average scores on all body image dimensions are shown. Covariate BMI was significant on all variables except perceived size, *F*s(1, 141 to 147) > 4.305, *p*s < .05, while age was significant on the perceived opinion of other girls and boys, respectively $F(1, 143) = 5.799$, $p = .017$ and $F(1, 141) = 7.115$, p = .009.

Table 3.3 Body Image: Average perceived body shape, body size, body appearance, perceived opinion of boys, and perceived opinion of girls (Standard Deviation)

	Elite (n=17)	Nonelite (n=51)	Controls (n=85)
Perceived body shape	5.75 (1.44)	5.58 (1.37)	6.05 (1.49)
Perceived body size	4.60 (1.35)	4.80 (1.51	4.83 (1.54)
Perceived body appearance	6.41 (1.14)	6.69 (1.14)*	6.01 (1.44)
Perceived opinion boys	6.31 (1.30)	6.55 (1.65)*	5.88 (1.54)
Perceived opinion other girls	6.56 (1.32)	6.63 (1.38)	6.04 (1.53)

** $p < .05$*

Contrast analyses did not reveal significant effects on perceived body shape, nor on perceived body size. However, on the body image dimension appearance several significant results were found for the contrast non-elites versus controls. More specifically, non-elites significantly perceived their body appearance more beautiful, $t(128) = 2.01$, $p = .046$, and were more positive about the perceived opinions of boys than controls, $t(123) = 2.31$, $p = .022$. In addition, a trend was found that non-elites perceived the opinion of girls more positive as well, $t(125) = 1.84$, $p = .069$. In conclusion, the body image of the elite gymnasts did not differ from that of the controls. Non-elites seemed to be more positive about their body appearance than controls; they perceived their own body appearance as more positive, as well as the opinion of boys about their body and to a lesser degree that of girls.

Correlations between dieting and body image

In Tables 3.4a, 3.4b and 3.4c, correlations between dieting frequency and multiple dimensions of the body image are presented for respectively elites (Table 3.4a), non-elites (Table 3.4b), and the controls (Table 3.4c). Pearson's correlations were computed for the most relevant body image dimensions, namely for relative weight discrepancy (as measure of desire for weight loss), BMI (as measure of actual body shape), perceived shape and perceived appearance, as well as for the perceived opinion of boys and girls. Among all three groups significant correlations were found between dieting on the one hand and BMI and perceived body shape on the other, as we expected. In general, dieting frequency was higher when gymnasts and controls were actually heavier or perceived themselves as more fat. Additional significant negative correlations with relative weight discrepancy were found, for the controls a strong relationship, $r = -.58$ ($p < .01$), and for the non-elites a

moderate relationship, r = -.39 (p < .05), indicating that they dieted more frequently if the percentage weight they desired to lose was larger.

In addition, we expected that the dieting behavior of controls would be related to a negative body image, whereas in gymnasts it would not. For the controls' dieting, significant negative moderate correlations were found with perceived body appearance, r = -.43 (p < .01) and perceived opinions of girls, r = -.38 (p < .01), and a weak negative correlation was found with perceived opinion of boys, r = -.23 (p < .05). The more negative controls perceived their own body appearance or the opinions of others, in particular that of other girls, the more frequently they dieted. On the other hand, the gymnasts' dieting was not significantly related to perceived body appearance, neither to the perceived opinions of girls and boys (Tables 3.4a and 3.4b). All negative correlations here were smaller than r = -.28, indicating weak strength, except for a moderate correlation between the elites' dieting and perceived appearance r = -.407. Furthermore, among the controls we expected the body weight characteristics (BMI and relative weight discrepancy) and perceived body shape to be significantly correlated to perceived body appearance, in contrast to the gymnasts. Results showed that the perceived body appearance of the controls was moderate negatively related to BMI, r = -.44 (p < .01), as well as strong to perceived body shape, r = -.57 (p < .01): The lower their actual body weight, or the thinner their perceived shape, the more beautiful controls perceived their body appearance. The moderate positive relationship between perceived appearance and relative weight discrepancy, r = .46 (p < .01) indicated that controls who wanted to gain weight, perceived their body as more beautiful, while the girls who desired weight loss perceived their body as less beautiful. For elites and non-elites, correlations between perceived body appearance and BMI, perceived shape, or weight discrepancy were not significant and weak, except for a non-significant moderate relationship between perceived shape and appearance in elites, r = .36.

A strong positive correlation was found between the gymnasts' dieting and perceived weight-related coach pressure for elites, r = .81 (p < .01) (Table 3.4a), and a moderate positive correlation was found for non-elites, r = .33 (p < .05) (Table 3.4b). The gymnasts' dieting frequency is higher when the perceived weight-related pressure of their coach is higher. For non-elites, a moderate positive correlation was also found between dieting and weight-related causal attributions of failure, r = .49 (p < .01), as well as a moderate positive relationship with weight-related causal attributions of success, r = .36 (p < .01). The stronger their own belief is that failure is caused by (alleged) overweight or that success is related to weight, shape and appearance, the more frequently non-elites dieted.

Table 3.4.a. Pearson's Correlations dieting and body image – Elite gymnasts

	BMI	Perceived Shape	Weight Discrepancy	Perceived Appearance	Opinions Boys	Opinions Girls	Success attributions	Failure attributions	Coach Pressure
Dieting	.583*	.583*	-.052	-.407	.279	.151	.214	.145	.806 **
BMI		.677**	-.438	-.282	-.103	-.175	.293	-.014	.487
Perceived Shape			-.217	-.360	.187	.079	.224	-.205	.616*
Weight Discrepancy				.251	.296	.037	-.431	-.085	-.127
Perceived Appearance					.394	.451	.315	.318	-.081
Opinion boys						.825**	.415	.049	.465
Opinion girls							.437	-.129	.473
Success attributions								.379	.517*
Failure attributions									.126

** p < .05; ** p < .01*

Table 3.4.b. Pearson's Correlations dieting and body image – Non-elite gymnasts

	BMI	Perceived Shape	Weight Discrepancy	Perceived Appearance	Opinions Boys	Opinions Girls	Success attributions	Failure attributions	Coach Pressure
Dieting	.441**	.474**	-.386**	-.251	.093	.049	.361*	.486**	.313*
BMI		.405**	-.499**	-.256	.164	.053	.027	.375**	.248
Perceived Shape			-.542**	-.272	-.007	.082	.105	.392**	-.036
Weight Discrepancy				.148	-.059	-.065	.036	-.317*	-.022
Perceived Appearance					.578**	.644**	-.005	-.406**	-.108
Opinion boys						.865**	-.039	-.027	-.304*
Opinion girls							-.044	-.052	-.407**
Success attributions								.291*	.392**
Failure attributions									.288*

** p < .05; ** p < .01*

Table 3.4.c. Pearson's correlations dieting and body image – Controls

	BMI	Perceived Shape	Weight Discrepancy	Perceived Appearance	Opinions Boys	Opinions Girls
Dieting	.536**	.560**	-.580**	-.430**	-.232*	-.384**
BMI		.623**	-.685**	-.438**	-.249*	-.358**
Perceived Shape			-.666**	-.567**	-.342**	-.419**
Weight Discrepancy				.460**	.235*	.444**
Perceived Appearance					.699**	.745**
Opinion boys						.794**

** p < .05; ** p < .01*

Discussion

The main purpose of the present study was to investigate the relationships among dieting behaviors and the multidimensional body image in gymnasts and "average" schoolgirls. We hypothesized that gymnasts, particularly elites, would show more symptoms related to disordered eating. Even though gymnasts showed a significantly lower BMI than the controls, they seemed to desire weight loss at least as much as the controls did. After controlling for BMI, both elites and non-elites expressed a significantly larger relative weight discrepancy. Bearing in mind that due to their greater lean-muscle mass athletes are in fact thinner than their BMI indicates (Davis, 1992), the gymnasts' desire for weight loss should be considered as extra unhealthy. Moreover, elites dieted more frequently than controls, and seemed to have used pathogenic dieting such as self-induced vomiting more often, especially when "weight-related exercise" which is probably a healthier method to lose weight in controls, was put aside. The differences here were not always significant at the traditional $p < .05$ level, yet this can be expected in such small samples. Some authors who find it more probable that not finding significant differences is due to insufficient power of the statistical tests rather than the reflection of a real absence of differences, therefore advise to adjust the significance level to .10 or even .15 when working with samples less than 20 participants (Pallant, 2005). In addition, chi-square analyses do not allow controlling for variables such as BMI. As the gymnasts' BMI is smaller, less weight control should be the result. If the influence of BMI could have been taken into account, we would have likely found larger differences, as was seen before with relative weight discrepancy. Most important, as the overall pattern of results was consistent, our findings seem to be in agreement with those of other studies showing that aesthetic athletes, especially at the elite level, are more at risk for disordered eating and pathogenic dieting behaviors (see Smolak et al., 2000; Sundgot-Borgen, 1993; 1994a; 2004).

Regarding body image, we assumed that gymnasts would have an equal or slightly more positive body image. Elites had higher scores than controls on all body image dimensions but none of the differences reached the significance level; therefore the conclusion seems justified that their body image is at the least equal to that of the controls. Non-elites appeared to be significantly more positive about their perceived appearance as well as about the perceived opinions of other girls and boys. Overall, these findings are in accordance with the meta-analysis of Hausenblas and Symons Downs (2001), revealing a more positive body image in athletes, narrowing it down to the dimension 'body appearance'.

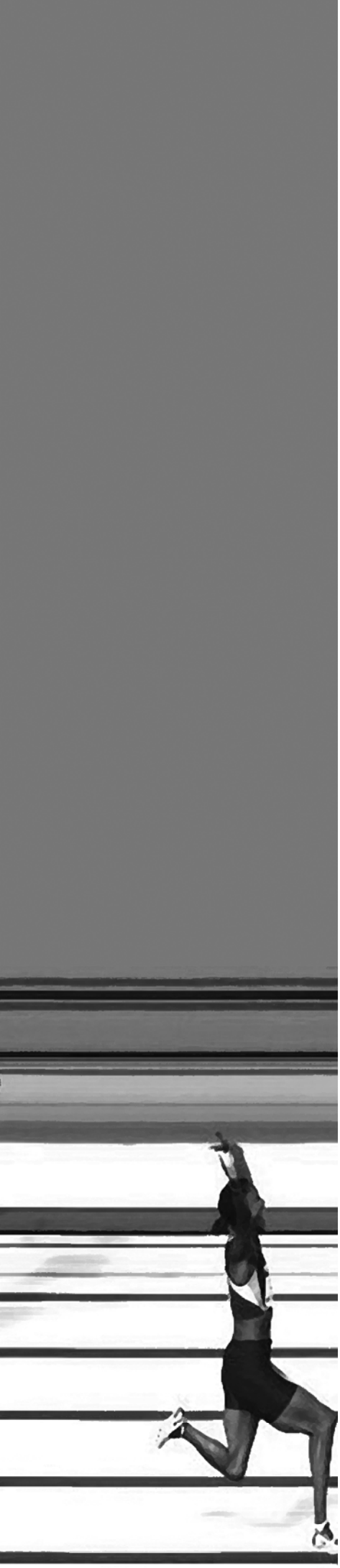
Putting these results together, elites reported more actual dieting and weight control, in spite of the fact that they were not more dissatisfied with their body. These results are consistent with the findings of Smolak et al. (2000) and Ziegler et al. (1998), who disputed that disordered eating and frequent dieting in athletes are linked to body image dissatisfaction. The finding that both elite and non-elite gymnasts reported a larger relative weight discrepancy than controls without being more dissatisfied with their body could also be taken as support for Sands' (2000) conclusion that a drive for thinness is perhaps not as closely related to the concept of body image as is often assumed.

In the present study we distinguished multiple body image components and found that dieting behavior of gymnasts was related differently to their body image than the dieting of the controls. Among gymnasts dieting was notably related to actual (BMI) and perceived body shape. Among controls, additional significant relationships of medium strength were found between dieting and perceived body appearance as well as with the perceived opinion of other girls. Moreover, among controls the dimensions weight and shape were strongly correlated with appearance: The lower their BMI and thinner their perceived shape, the more positive and beautiful controls perceived their body, leading to the conclusion that the average schoolgirl seems to believe that "thin is beautiful". Similar correlations were not significant and weaker for the gymnasts, suggesting that this "thin is beautiful" explanation may be less applicable to them.

Yet, it should be noted here that Pearson's correlations in small samples are generally less reliable, and that the absence of significant results again could be due to insufficient power of the statistical tests. When the focus is directed at the amount of shared variance (Pallant, 2005), it becomes apparent that 16.6% of the elites' dieting seems to be explained by perceived appearance compared to 18.5% of the controls' dieting. However, no less than 64% of the variance of the elites' dieting was explained by weight-related coach-pressure. Also in non-elites, sport-specific variables such as causal attributions for failure (24%) and success (13%), as well as coach-pressure (10%) seemed to explain more variance of their dieting behavior than perceived appearance (6%). It would be good to confirm these relationships in future studies with larger samples and for instance with other athletes such as males or sport participants in other sports. In addition, the influence

should be investigated of other sport-specific factors on these relations, such as motivational climate, goal perspective, perceived competence and body image in and outside the sport arena.

With respect to the current study, perhaps gymnasts realize they look good and thin enough in daily life, but believe they need a thinner body for their sport to enhance their physical ability. This idea would fit the multidimensional approach that considers physical appearance and physical ability as separate constructs (Marsh, 2001), and refers to the notion of transient body satisfaction "on and off the pitch" (Russell, 2004). Indeed, significant correlations were found between the gymnasts' dieting and weight-related causal attributions of success and failure and perceived weight-related coach pressure. The stronger their own belief or that of their coach that failure is caused by their (alleged) overweight, the more frequently gymnasts diet. It seems that gymnasts are rather convinced or persuaded that "thin is going to win".



Chapter 4

Contextual body image and athletes' disordered eating: The contribution of athletic body image to disordered eating in high performance women athletes

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Abstract

The present study investigated the contribution of a contextual body image perspective to understanding disordered eating in athletes. Because existing questionnaires were not suitable for measuring body image in the contexts of sport and daily life, we developed the "Contextual Body Image Questionnaire for Athletes" (CBIQA) in which body image is divided into "appearance", "muscularity", "thin-fat self-evaluations" and "thin-fat perceived opinions of others", in both contexts. In Study 1, the internal validity and reliability of this questionnaire was established in a general, heterogeneous sample of female sport participants and exercisers. In Study 2, the external validity was determined in a sample of 52 high performance women athletes who mainly participated in aesthetic or endurance sports, 19 of which were classified with and 33 without disordered eating. Furthermore, the results of Study 2 showed that both "thin-fat self" and "thin-fat opinions of others" in sport made significant unique contributions to explaining eating disorder variance, indicating the important role of athletic body image. In conclusion, the contextual body image approach seems to be a promising framework for a better understanding of athletes' disordered eating.

Introduction

Eating disorders are generally characterized by severe disturbances in eating behavior as well as in body image (American Psychiatric Association [APA], 1994). The two components of body image that are generally found to be disturbed when eating disorders occur are the perceptual and evaluative component (Gardner, 2001). Whereas perceptual distortions consist of inaccurate judgments of one's body size, a negatively evaluated body image refers to a negative body attitude or more specifically "dissatisfaction with one's body size, shape or some other aspect of body appearance" (Gardner, 2001, p. 193). Both types of body image disturbance are part of the diagnostic criteria for the clinical eating disorders anorexia and bulimia nervosa, as well as for eating disorders not otherwise specified (APA, 1994). Moreover, in a general population body image disturbances may also be classified as a variable risk factor that precedes eating disorders (Jacobi et al., 2004).

In athletes the relationship between body image and eating disorders seems to be more complex. First, even if athletes do not always meet the criteria for clinical or sub-clinical eating disorders, it is still possible that they show very disturbed eating patterns, referred to as disordered eating and reflecting: "A wide spectrum of harmful and often ineffective eating behaviors used in attempts to lose weight or achieve a lean appearance. The spectrum of behaviors ranges in severity from restricting food intake to bingeing and purging…" (Otis, Drinkwater, Johnson, Loucks, & Wilmore, 1997, p. i). Disordered eating includes a category of symptomatic individuals who show fewer symptoms or less severe symptoms than individuals with anorexia nervosa, bulimia nervosa, or eating disorders not otherwise specified (Mintz & O'Halloran, 2000; Nagel, Black, Leverenz, & Coster, 2000).

Second, in athletes the relationship between disordered eating and body image appears to be less straightforward than in the general population. On the one hand, and in line with the general findings, body image disturbances seem to contribute to patterns of disordered eating in athletes (Berry & Howe, 2000; Byrne & McLean, 2002; Williamson et al., 1995), leading to the claim that a disturbed body image is an absolute criterion of subclinical eating disorders in athletes just as it is in non-athletes (Beals & Manore, 1994). On the other hand, according to Sundgot-Borgen (1993), a disturbed body image is merely a relative criterion as it may or may not be part of eating disorder symptomatology in athletes. Several studies reported that certain elite women athletes dieted frequently and used pathogenic weight control methods despite being relatively satisfied with their body (De Bruin, Oudejans, & Bakker, 2007; Torstveit, Rosenvinge, & Sundgot-Borgen, 2008; Ziegler et al., 1998). Torstveit et al. reported that although competing in leanness sports was associated with more clinical eating disorders, fewer athletes in leanness sports were dissatisfied with their bodies than in non-leanness sports. A meta-analysis of 34 studies on eating problems in female athletes confirmed that, in athletes, a high drive for thinness

was not accompanied by high body dissatisfaction. Moreover, it was suggested that eating problems in athletes may differ from those in non-athletes (Smolak, Murnen, & Ruble, 2000). Ziegler et al. concluded that the dieting behaviors of figure skaters did not appear to be associated with perceptions of being overweight nor with a negative body image, contrary to the general belief that a negative body image and dieting are causally linked. De Bruin et al. found that female gymnasts' dieting behaviors were only moderately related to some but not all aspects of body image, while stronger relationships were found with sport-specific variables such as weight-related coach pressure. Rather than believing that "thin is beautiful", gymnasts seemed convinced or persuaded that "thin is going to win" (De Bruin et al., 2007). Other authors also concluded that it is not necessarily body dissatisfaction that drives these athletes towards dieting and pathogenic weight control, but rather the demands of their specific sport (McNulty et al., 2001; Sundot-Borgen, 1994; Torstveit et al., 2008).

Apparently, body image is a multifaceted, dynamic and reactive concept rather than a stable and consistent trait (Tiggemann, 2001). Individuals have different opinions and feelings about their bodies in different situations. Several studies showed changing perceptions of a person's body in relation to the context in which he or she was situated (e.g., Haimovitz, Lansky, & O'Reilly, 1992; Krane, Waldron, Michalenok, & Stiles-Shipley, 2001; Loland, 1999; Russell, 2004). Athletes also seem to measure themselves in relation to the predominant body ideal of their sport, as well as to hegemonic ideals in society at large (Loland, 1999). Four qualitative studies illustrated that elite male and female athletes reported to have multiple body images, namely, an athletic and a social body image (Follo, 2007; Krane et al., 2001; Loland, 1999; Russell, 2004). Athletic body image can be defined as the "internal image one has of his or her body and the evaluation of that image within an athletic context" (Greenleaf, 2002, p. 64), while the social body image refers to body evaluation in the context of daily life. Moreover, it was shown that athletes often experienced different levels of body satisfaction in these two contexts (Krane et al., 2001; Loland, 1999; Russell, 2004). Female rugby players, for example, perceived their body as functional and positive for their sport, while their body satisfaction decreased off the pitch, as their strong, muscular and athletic bodies did not meet the feminine beauty demands of western society (Russell, 2004).

Among certain athletes whose bodies generally fit within our socially constructed definitions of femininity and our cultural body ideals, for example, in aesthetic and endurance sports, a "body satisfaction transiency" in opposite direction is conceivable. These athletes might experience body satisfaction in daily life due to their lean and thin bodies that generally meet western cultural standards (Torstveit et al., 2008), while they might be more negative about their athletic body image due to stricter bodily demands in their sport (De Bruin et al., 2007). If these athletes exhibit some kind of dieting behavior, then this could be primarily related to body dissatisfaction in the sport context (De Bruin et al., 2007). In a qualitative study on the body attitudes of elite sportsmen, a first

indication was found that the desire for weight loss of certain participants indeed seemed to be linked to their identity as elite athletes, not as men (Loland, 1999). The interviewed male ski jumpers were concerned with their weight and with dieting, "not because they wanted to look good, but to be able to make longer jumps" (p. 295), while they were satisfied with how they looked (Loland, 1999). These studies suggest that for athletes body image can and should be divided into an athletic and a daily life body image especially in relation to eating-related problems. So far this has not been done in quantitative studies.

In the present study we took a first step in investigating the differential influences of the athletic and daily life body images on disordered eating of athletes. The first and main aim was to confirm that it is sensible and useful to take such a more dynamic and contextual perspective on body image in relation to disordered eating. In this respect, we explored differences between and within athletes with and without disordered eating on all dimensions of the daily life and athletic body image. First, we expected that athletes with disordered eating would be more negative on multiple body image aspects than those without disordered eating. Furthermore, we hypothesized that, overall, athletes would have a more positive body image in the context of daily life than in sport, as their lean and thin athletic bodies meet the cultural body ideals. A secondary aim was to gain insight into the degree to which each of the body images would contribute to disordered eating in athletes. In this respect, we hypothesized that the athletic body image would be the main factor in explaining disordered eating variance. After all, previous studies suggested that the desire for weight loss and subsequent dieting behaviors of men and women athletes seemed to be linked to their identity as elite athletes (De Bruin et al., 2007; Loland, 1999; Follo, 2007). As this was the first quantitative investigation on the influence of body image in different contexts on disordered eating in athletes, we were careful not to formulate more specific hypotheses.

Before we could address our just mentioned main and secondary aims we needed an instrument to discriminate the athletic and daily life body images. Existing questionnaires were not suitable, because they are developed for the general population, and, more importantly, do not differentiate between body images in daily life and sport. Therefore, in Study 1 we first developed and internally validated a questionnaire to measure multidimensional body image in daily life and sport. We validated the questionnaire in a general, heterogeneous sample of female sport participants and exercisers. In Study 2 we determined external validity of the questionnaire and answered our research questions by examining female high performance athletes from sports in which leanness, low weight or appearance are considered to be of great importance (e.g., aesthetic and endurance sports), who also seem to be at the highest risk for disordered eating (Otis et al., 1997; Sundgot-Borgen & Torstveit, 2004). This sample contained both a group of high performance female athletes with disordered eating (or more severe eating disorders) and a control group without disordered eating.

Study 1

Method

Procedure

Since our aim was to include a general heterogeneous sample, various sport organizations were approached of both high-risk lean/weight-related sports concerning disordered eating (e.g., aesthetic, weight class, endurance sports) and low-risk non-lean sports (e.g., ball sports) (Sherman, Thompson, Dehass, & Wilfert, 2005). In addition, several non-sport fitness centers and dance schools were approached, as well as students of a bachelor program for physical education and post-master program in sport psychology. The participants were approached through their teachers or trainer/coaches who asked the athletes to participate as a control group in a larger study on the effect of sport participation on body image and dieting. They were told that participation was voluntary and strictly anonymous. Data collection occurred before or after class or training in the presence of a researcher in order to give instructions, answer any questions, and to collect written informed consent of all participants, and their parents if they were under the age of 18. The research design was reviewed and approved by the Ethics Committee of our research institute.

Participants

The general sample of women athletes and exercisers consisted of 152 women participating in various leanness and non-leanness sports, and non sport fitness activities at (inter)national, regional and recreational level. The sample also included 45 female bachelor students in physical education who participated in leisure-time sports besides their educational sport activities. More specifically, the women participated in aesthetic sports such as gymnastics (n = 9), classical or modern dance (n = 23), and aerobics (n = 14), and in endurance sports such as athletics or skating (n = 5). In addition, they participated in weight class sports such as judo, jiu-jitsu, boxing (n = 8) and rowing (n = 23) as well as in ball sports such as hockey (n = 7), baseball, basketball, volleyball (n = 14), football (n = 45), and racket sports (n = 4). Their average age was 23.6 years old (SD = 9.04), varying from 13 to 58 years and they spent on average 5.9 hours a week (SD = 3.95) on their sport activities.

Materials

The Contextual Body Image Questionnaire for Athletes (CBIQA) (see Appendices)[1] included 30 questions about the athletes' evaluation of different body image aspects, i.e., appearance, body shape, weight, fat percentage and muscularity, parallel to the body image dimensions distinguished by De Bruin et al. (2007), Ricciardelli and McCabe (2000), and Richards and Marsh (2006). Participants were asked to evaluate these body

[1] The instrument was developed in Dutch and translated in English by the first author for the purpose of this manuscript only. The original Dutch version of the questionnaire is available upon request.

image aspects in two different contexts; one time for daily life and, subsequently, for sport. Based on the social-comparison theory (Festinger, 1954), the looking-glass self framework (Cooley, 1902) as well as on statements and results of others (Cash, 2000; Loland, 1999), it was argued that body evaluations should be divided into self-evaluations, interpersonal comparisons, and social evaluations. Whereas social-comparison theory claims that individuals evaluate or enhance some aspects of the self by taking an external frame of reference through comparing oneself with others, the "looking glass self" or "reflected self" refers to our self-feelings about the representation of others' evaluations of certain characteristics they have ascribed to us (Cooley, 1902). Thus, in the questionnaire every body image aspect was measured with three items: [In daily life / Concerning my sport], a. "I think my [body image aspect] is …"; b. "I think my […] compared to others is …"; and c. "Others think my […] is …". All items were scored on a 7-point Likert-scale with anchored answering categories. Scale scores were obtained by dividing the sum of the item-scores by the total number of items on the scale.

Data analysis

To establish internal validity of the CBIQA, two separate factor analyses were conducted on the 15 daily life body image items and 15 athletic body image items, respectively. The factor analyses were performed by means of principal component method of extraction. The data were considered to be suitable for factor analyses as the correlation matrices showed multiple correlations of $r = .3$ or higher, the Bartlett's tests of sphericity were significant at $p < .05$, and the Kaiser-Meyer-Olkin values exceeded the recommended value of .6 (Kaiser, 1970; 1974 in Pallant, 2005). As the minimal sample size for conducting factor analyses is 6 times the number of items included (Tabachnick & Fidell, 2007), the minimum amount of 90 participants was exceeded.

Results

The factor analysis of the 15 daily life body image items revealed the presence of four components with eigenvalues exceeding 1, explaining 79.4 of the total variance (see Table 4.1a), while the analysis of athletic body image revealed the presence of three components, explaining 76.7 of the total variance (see Table 4.1b). With the subsequent oblimin analyses, four factors were distinguished which were identical in both contexts allowing a good comparison between body evaluation in daily life and sport: 1) "appearance"; 2) "muscularity"; 3) "self-evaluations of shape/weight/fat" (items a, b), from now on abbreviated as "thin-fat self"; and 4) "perceived opinions of others on shape/weight/fat" (items c), from now on referred to as "thin-fat others". Concerning sport, the interpretation of the four factors tended to be somewhat less clear; the results pointed towards a somewhat stronger correspondence between the athlete's own opinion and the perceived opinions of others regarding the thin-fat dimension. Cronbach's alphas of the scales ranged from .83 to .95.

Table 4.1.a Oblimin pattern matrix for the 15 daily life body image items (n = 152)

Factors	Thin-fat dimension		Appearance	Muscularity
	Self-evaluations	Others' opinions		
$Appearance_a$			.889	
$Appearance_b$			.854	
$Appearance_c$			.916	
$Shape_a$	.760			
$Shape_b$	.782			
$Shape_c$		-.664		
$Muscle_a$				.901
$Muscle_b$				.901
$Muscle_c$				.861
$Weight_a$	.850			
$Weight_b$	.869			
$Weight_c$		-.936		
Fat_a	.873			
Fat_b	.820			
Fat_c		-.819		
Reliability (α)	.93	.83	.89	.86
Mean (SD)	4.43 (.59)	4.05 (.45)	5.01 (.93)	3.97 (.67)

Note. $Shape_c$ has the lowest loading. As weight and fat percentage can be measured objectively, the perceived opinion of others on weight and fat will be clearer than on shape

$_a$ own perception; $_b$ own perception compared to others; $_c$ perceived opinion of others

Conclusion

All in all, the results showed that the internal validity and reliability of the Contextual Body Image Questionnaire for Athletes seem to be quite satisfactory. Further investigation should establish the internal validity and consistency of this questionnaire in other samples. Furthermore, the external validity of the questionnaire should be determined. Study 2 starts with executing these additional validation procedures in a more specific sample of women athletes with and without disordered eating. Additionally, the contribution of a contextual body image perspective to understanding disordered eating in athletes was investigated.

Table 4.1.b Oblimin pattern matrix for the 15 athletic body image items (n = 152)

Factors	Thin-fat dimension		Appearance	Muscularity
	Self-evaluations	Others' opinions		
$Appearance_a$			.955	
$Appearance_b$			.943	
$Appearance_c$			.937	
$Shape_a$	.934			
$Shape_b$	.885			
$Shape_c$		-.534		
$Muscle_a$				.901
$Muscle_b$				.949
$Muscle_c$				.846
$Weight_a$	.915			
$Weight_b$	.821			
$Weight_c$		-.925		
Fat_a	.902			
Fat_b	.850			
Fat_c		-.975		
Reliability (α)	.95	.87	.94	.88
Mean (SD)	4.39(.67)	4.10 (.49)	4.66 (.96)	3.76 (.62)

Study 2

Method

Procedure

Since our aim was to include high performance women athletes with disordered eating, first, qualified sport psychologists and clinical psychologists were requested to ask for the participation of women athletes competing on national or international levels with disordered eating with whom they were currently working. In addition, the professionals were also asked to provide suitable controls without disordered eating who were individually matched by sport type, level of participation and age group. In this way, 12 participants with disordered eating and 12 matched participants without disordered eating were found who were willing to participate. Second, to increase the number of participants, we got access to 28 aesthetic athletes from synchronized swimming and several disciplines of gymnastics through their coach and team physician. All athletes were asked by their coach, physician, dietician or psychologist to participate in a study on eating habits and body image in sport. They were told that participation was voluntary and strictly anonymous; all women athletes, except one, were willing to participate in the study. Next, the women who agreed to participate were contacted in person by the

researcher(s) who gave the participants an oral and written explanation of the purpose of the study. It was explained that they could resign from the study at any time without any consequences. Additionally, the possibility of consulting a psychologist after participation was explicitly mentioned, in case the women had any questions or needed professional support. Participants were asked to complete the questionnaires (see section Materials) and to answer candidly and privately. They completed the questionnaires either in the presence of the researcher(s) (n = 24) or at home (n = 28). We checked if these different ways of completing the questionnaire was in any way associated with differences in relevant background characteristics (e.g., BMI, age, eating disorder symptomatology), and no such differences were found. All participants handed in a signed informed consent, as well as the requested written parental permission if they were under the age of 18. To guarantee the participants' anonymity, the questionnaire was separated from the informed consent(s). The research design was reviewed and approved by the Ethics Committee of our research institute.

Participants

The participants of Study 2 were 52 highly competitive women athletes between 11 and 27 years of age, participating on (inter)national level in various sports in which leanness, low weight and/or appearance are considered to be important. Their average age was 19.1 years old (SD = 3.54) and they spent on average 14.9 hours a week (SD = 7.24) on their sport. More specifically, the sample included 28 aesthetic athletes from (rhythmic/acrobatic) gymnastics and synchronized swimming, in which the subjective evaluation by judges of competitive or artistic performance is the most important aspect (Sundgot-Borgen & Torstveit, 2004). In addition, 18 women participated in endurance sports in which the main focus is on aerobic endurance training, such as middle and long distance running, swimming or long distance speed skating. Six women competed in other sports (e.g., tennis) that are typically characterized as non-lean sports but increasingly regarded as sports in which athletes are also expected to resemble a lean, athletic body ideal due to the increase of revealing sport attire and media exposure (Sherman et al., 2005).

All 52 participants took part in a diagnostic screening. The categorization of the participants was based on the criteria for disordered eating proposed by Nagel, Black, Leverenz and Coster (2000). Nagel et al. presented an overview in which the official criteria to diagnose anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified (APA, 1994) were linked to certain scores on several questions of the Eating Disorder Examination Questionnaire (EDE-Q) and questions about amenorrhea, BMI and current fat percentage that were included in this study (see section Materials). In addition, they proposed that subjects with disordered eating meet two of the major criteria: amenorrhea, low BMI or low body fat, purging methods, and (objective or subjective) bulimic episodes, in addition to two of the following minor criteria: fear of weight gain, feelings of fatness, maintained low weight, and increased importance of weight/shape

(Nagel et al., 2000). If participants did not meet these criteria, they were placed in the control group without disordered eating. For the first group of 24 matched participants, a 100 percent correspondence existed between our diagnostic screening and the clinical classifications of the professionals. In the second group of 28 aesthetic athletes, seven athletes were diagnosed as suffering from disordered eating; one of whom reported having been professionally diagnosed with an eating disorder as well and currently in treatment. The remaining 21 aesthetic athletes were classified without disordered eating. In total, the sample of Study 2 consisted of 19 athletes with disordered eating and 33 participants without disordered eating.

Materials

In addition to the *CBIQA*, participants were also asked to complete various related body image measures for establishing external validity. First, participants marked their appearance, body shape, weight, fat percentage, and muscularity evaluations on corresponding *Visual Analogue Scales* (*VAS*) of ten centimeter each (see Brown, 2006). Second, participants completed relevant items about body (dis)satisfaction with appearance, body shape (defined as leanness and not as proportionality), weight, fat percentage and muscularity derived from the *Body Image and Body Change Inventory* (Ricciardelli & McCabe, 2002), and the *Body Areas Subscale* of the *Multidimensional Body-Self Relations Questionnaire* (MBSRQ; Cash, 2000) which were measured on a 7-point scale in the present study. In addition, the *Somatomorphic Matrix* (Gruber, Pope, Borowiecki, & Cohane, 1998) was delivered to the participants in paper and pencil format (see Cafri, Roehrig, & Thompson, 2005). This contour drawing scale test acknowledges the importance of measuring body image perception with separate axes for fat and muscularity. Besides choosing a female figure that best represented their actual body, participants were also asked to choose the image they themselves perceived as ideal, in the present study divided into daily life and sport, as well as the perceived ideal of others in both contexts: a discrepancy between actual and ideal images reflects body dissatisfaction with muscularity and/or fat (Gruber et al. 1998). Moreover, the following materials were included:

Background characteristics. The questionnaire contained questions about demographic characteristics, sport participation and several eating disorder-related variables. First, participants reported their age, height, current and ideal weight for sport and daily life, as well as their current and desired fat percentage. Because measuring body composition by the researcher(s) was too confronting for some athletes, especially those with disordered eating, we asked the participants to provide recent objective measures of height, weight and fat percentage that were collected by their physician, dietician or any other medical staff member. With these figures, BMI was calculated, as well as the relative discrepancy scores for weight and fat percentage. Relative weight discrepancy was computed by subtracting the current weight from the desired weight divided by the current weight, multiplied by 100 (De Bruin et al., 2007). Relative fat percentage discrepancy was calculated by simply subtracting the current fat percentage from the desired fat percentage.

Second, several questions about sport participation were asked, such as sport type, level of participation (i.e., international, national), starting age of sport participation, and number of hours weekly spent on training and competition. Finally, the questionnaire consisted of various eating disorder-related questions about amenorrhea (the number of months without menstrual periods) and eating disorder history. In addition, the attitude towards food was measured on a 7-point Likert-scale running from 1 (extremely tense) to 7 (extremely relaxed), with the following item: "How do you feel towards food?" that is recommended as a screening question for disordered eating (Torstveit, 2004, p. 89).

Eating Disorder Examination Questionnaire (EDE-Q). The EDE-Q (Fairburn & Beglin, 1994; Dutch version: van Furth, 2000) is derived from the Eating Disorder Examination (EDE) which is an investigator-based interview to diagnose eating disorders (Cooper, Cooper, & Fairburn, 1994). The EDE and EDE-Q are highly correlated for many of the behavioral and attitudinal eating disorder features (Fairburn & Beglin, 1994; Wilfley, Schwartz, Spurrell, & Fairburn, 1997). Strong correlations between EDE and EDE-Q scores were found in a community sample (Mond, Hay, Rogers, Owen, & Beumont, 2004). All in all, EDE-Q has good concurrent and acceptable criterion validity (Mond et al., 2004) as well as good internal consistency with Cronbach's alphas varying from .78 to .93, and good 2-week test-retest reliability with correlations of .81 or higher (Luce & Crowther, 1999). In the present study, the EDE-Q was used to classify the participants' disordered eating according to the subject classification system of Nagel et al. (2000). In addition, the average EDE-Q total score was computed, following the general scoring instructions. EDE-Q total score varies from 0 (*never* or *not al all*) to 6 (*everyday* or *clearly*), respectively, indicating to what degree an individual is suffering from eating disorder symptomatology (Jansen, 2000).

Data analysis

Similar factor analyses and reliability analyses were conducted as in Study 1. In factor analysis smaller samples are permitted when critical values for factor loadings are taken into account depending on the actual sample size (Tabachnick & Fidell, 2007). Subsequently, in Study 2 only items with loadings of .722 or higher should be considered (Stevens, 1996). Moreover, for establishing external validity, Pearson's correlation analysis was used to establish the relationships between the items and scales of the CBIQA with corresponding VAS-scores, existing body (dis)satisfaction items and discrepancy scores of the Somatomorphic Matrix. Whereas higher correlations with the VAS-scores and the related body image items were expected, lower correlations were expected with the Matrix which measures body size appraisals rather than body evaluations.

To compare the subgroups of athletes with and without disordered eating on several background characteristics (Table 4.2) and body image components (Table 4.3), several chi-square analyses and non-parametric Mann-Whitney U Tests were computed. As scores in non-parametric statistics are converted to ranks, the actual distribution of scores and

violation of normality does not matter (Pallant, 2005). The assumption of normality appeared to be violated for several body image components and EDE symptomatology, reflecting the underlying nature of the constructs being measured (Tabachnick & Fidell; 2007). Most variables were negatively skewed, suggesting more scores on the higher end of the scale (i.e., perceived towards beautiful, too muscular and too fat, respectively), except for "thin-fat others" in daily life which was positively skewed (i.e., perceived towards too thin). In addition, Wilcoxon Signed Rank Tests were used to investigate if athletic and daily life body images significantly differ from each other by testing within-group differences between daily life and sport for the four pairs of body image components. The Wilcoxon Signed Rank Tests were performed for the whole sample and for the subgroups of athletes with and without disordered eating, separately (Table 4.3).

Finally, Spearman Rank Order Correlations were used to determine the most relevant relationships of the EDE total score with the body image subscales of the CBIQA (Table 4.4). In addition, regression analyses were conducted to explore which body image aspect would best explain disordered eating (Table 4.5). Before conducting these analyses, the test assumptions were examined such as the presence of multicollinearity (present if correlations between independent variables > .9; Tolerance values < .10, or VIF values > 10) (Tabachnick & Fidell, 2007); no such problems with the data were found though some correlations between the corresponding body image components of daily life and those in sport were very strong between .7 and .8 (see also Table 4.4). Therefore, two separate regression analyses for daily life and for sport were conducted to select the most relevant body image components and limit the number of independent variables in advance. As disordered eating also seems to be related to the athletes' actual body composition (Berry & Howe, 2000), we included BMI and fat percentage into the subsequent hierarchical multiple regression analysis in step 1, whereas the most relevant body image subscales were included in step 2. As BMI and fat percentage did not make a statistically significant unique contribution to the equation, the final standard multiple regression analysis was conducted without controlling for actual body composition (see Table 4.5). All regression analyses were computed with transformed data, using the manipulations "reflect and square root" for negatively skewed variables and "square root" for positively skewed variables (Tabachnick & Fidell, 2007).

Results

The results of the factor analysis for daily body image were rather similar to the results in Study 1. Both factor analyses revealed the presence of four components with eigenvalues exceeding 1, but in sport the results showed stronger correspondence between thin-fat self-evaluations and perceived opinions of others. Subsequently, four identical scales for daily life and sport were constructed in order to be able to compare the athletes' body evaluations in these contexts. In the sample of 52 women athletes, the internal consistency of the scales ranged from .79 to .93, inspiring our confidence in using these scales in Study 2.

For establishing external validity, correlations between the items and scales of the CBIQA with several external body image measures were conducted. Pearson's correlations between the body image items and corresponding VAS-scores ranged from r = .44 to r = .83, ps < .001. Pearson's correlations between the constructed body image scales with the existing body (dis)satisfaction items and the discrepancy scores of the Somatomorphic Matrix were all significant and ranged from r = .28 to r = .81, ps < .05, except for the correlation between muscularity in sport and the Matrix muscle discrepancy score, r = .112, p > .05, as expected. We concluded that adequate external validity was demonstrated. All in all, the validation results provided us with sufficient indications for effectively using the CBIQA for answering our research questions.

Table 4.2 Differences between athletes with (DE+) and without disordered eating (DE-) on average background variables, mean scores (Standard Deviation)

	DE+ (n = 19)	DE- (n = 33)
Current age (in years)	18.89 (3.40)	19.21 (3.67)
Starting age sport (in years)	9.00 (4.27)	8.36 (4.09)
Training hours	12.91 (6.15)	16.09 (7.64)
Height (in meters)	1.68 (.09)	1.68 (.09)
Weight (in kilograms)	58.64 (11.67)	57.49 (9.98)
BMI (kg / m2)	20.69 (2.89)	20.23 (2.23)
Fat (in percentages) [a]	20.29 (5.97)	20.96 (4.09)
Weight discrepancy sport [a]	-6.97 (4.54)	-3.74 (3.75)
Weight discrepancy daily life [a]	-2.88 (4.38)	-2.45 (3.18)
Fat discrepancy [a]	-3.51 (1.36)	- 2.97 (1.12)
Age first menstrual period	12.22 (2.88)	12.42 (3.56)
Amenorrhea (in months)	5.15 (5.72)	1.73 (.94) *
Attitude towards food [b]	2.84 (1.26)	4.41(1.43) *
EDE-Q total score [c]	3.12 (1.20)	.98 (.94) *

[a] *in percentages*

[b] *Scale (1 - 7) running from 1 (extremely tense) to 7 (extremely relaxed)*

[c] *Scale (0 - 6) running from 0 (never or not al all) to 6 (everyday or clearly)*

* $p < .05$

As previously mentioned, the purpose of this study was to investigate whether it is useful to apply a contextual body image perspective by exploring differences between daily life and sport body images in relation to disordered eating, and, subsequently, to gain insight into the degree to which each of the body images contributes to disordered eating in athletes. First, the two subgroups of athletes with disordered eating (n = 19) and without disordered eating (n = 33) were compared on several background variables. In this respect, no significant differences were found on sport type, χ^2 (2, N = 52) = 4.365, p > .05, and level of participation, χ^2 (2, N = 52) = 3.597, p > .05. As can be seen from Table 4.2, no significant differences were found on age, starting age of sport participation, average age

of the first menstrual period, total training hours, height, weight, BMI, current fat percentage, and relative discrepancy scores for weight and fat percentage either, with *Z*-values ranging from -1.80 to -.05, *p*s > .05. The discrepancy between current and desired weight for sport tended to be somewhat higher for the athletes with disordered eating but this did not reach the significance level of .05 ($Z = -1.80$, $p = .072$). Significant differences were found for amenorrhea, $Z = -2.98$, $p < .01$, the attitude towards food, $Z = -5.07$, $p < .001$, as well as the total score of the EDE-Q, $Z = -3.44$, $p < .01$. Athletes with disordered eating reported more amenorrhea, were significantly tenser towards food and scored significantly higher on eating disorder symptomatology than the control group of athletes without disordered eating, inspiring confidence in our disordered eating classification.

Subsequently, differences between and within athletes with and without disordered eating on all dimensions of the daily life and athletic body image were explored. Table 4.3 shows the average scores of the two subgroups on the body image scales and the results of the group comparisons. As expected, athletes with disordered eating were generally more negative on multiple body image aspects than athletes without disordered eating in both contexts. More specifically, in daily life, athletes with disordered eating were more negative about their appearance, $Z = -3.42$, $p < .01$, and had more negative thin-fat self-evaluations, $Z = -2.76$, $p < .01$, but no differences were found on thin-fat others ($p = .67$). Regarding athletic body image, significant differences were found on appearance, muscularity, and thin-fat self, $Z = -3.00$, $p < .01$, $Z = -2.54$, $p < .05$, $Z = -2.52$, $p < .05$, respectively, suggesting that athletes with disordered eating were also more negative about their appearance, muscularity, and thin/fatness in sport than athletes without disordered eating. No significant differences were found on thin-fat others ($p = .43$). In addition to between-group differences, within-group differences were explored by comparing the athletic body image components with those in daily life. We hypothesized that the high performance women athletes would have a more negative athletic body image. The results of the Wilcoxon rank tests for all 52 participants revealed significant differences for all four pairs of body image components, *Z*s > -2.24, *p*s < .05. In line with our hypothesis, more positive ranks were found for the appearance pair, indicating lower scores for perceived appearance in sport than in daily life, while more negative ranks were found for the other pairs, pointing towards higher (read: more negative) scores on the other body components in sport. Within the subgroup of athletes without disordered eating, Wilcoxon rank tests showed significant differences suggesting a more negative athletic body image, *Z*s > -2.36, *p*s < .05, except for muscularity, $Z = -.61$, $p = .54$. For athletes with disordered eating, significant results were found for muscularity, $Z = -2.65$, $p < .01$, in addition to a non-significant trend for appearance, $Z = -1.95$, $p = .052$, indicating that they were more negative about their muscularity in sport and tended to be more negative about their appearance in sport. Moreover, for thin-fat others, significantly higher (read: more negative) scores in sport than in daily life were found, $Z = -2.44$, $p < .05$, but not for thin-fat self, $Z = -1.40$, $p = .16$.

Table 4.3 Mean scores (Standard Deviation) on body image scales for DE+, DE-, and total sample

	DE+ (n = 19)	DE – (n = 33)	Total Sample (n = 52)
Daily life			
Appearance*	4.03 (.96)	5.07 (.85) **	4.69 (1.02) **
Muscularity	3.96 (.74) **	4.27 (.64)	4.15 (.69) **
Thin-fat self-evaluations ($_{a,b}$) *	4.82 (.97)	4.25 (.50) **	4.46 (.75) **
Thin-fat perceived opinion others ($_{c}$)	3.85 (.84) **	3.83 (.47) **	3.84 (.62) **
Sport			
Appearance*	3.72 (1.16)	4.77 (.85) **	4.38 (1.09) **
Muscularity*	4.85 (.87) **	4.35 (.64)	4.54 (.77) **
Thin-fat self-evaluations ($_{a,b}$) *	5.06 (.93)	4.57 (.67) **	4.74 (.81) **
Thin-fat perceived opinion others ($_{c}$)	4.18 (1.06) **	4.14 (.56) **	4.14 (.79) **

Note. Differences between DE+ and DE- were tested with Mann Whitney U-Tests, and Wilcoxon signed ranks test were used for within-group differences on daily life and sport body image components[2]

$_a$ own perception; $_b$ own perception compared to others; $_c$ perceived opinion of others

** $p < .05$ in Mann Whitney U-Tests testing differences between DE+ and DE-*

*** $p < .05$ in Wilcoxon signed ranks test, testing contextual differences between pairs of body image components in DE+, DE- and the whole sample, respectively*

Finally, analyses were conducted to gain insight into the degree to which each of the body images contributed to disordered eating in the athletes. Table 4.4 (see final row) shows the correlations between EDE-Q total score and the body image subscales of the CBIQA. Significant correlations were found with daily life appearance, $r = -.47$, $p < .01$ and daily life thin-fat self, $r = .52$, $p < .01$, indicating relationships between more eating disorder symptomatology and evaluating oneself as less beautiful and more fat in daily life, respectively. For sport, significant relationships were established with appearance, $r = -.51$, $p < .01$, muscularity, $r = .42$, $p < .01$, and thin-fat self, $r = .61$, $p < .01$. In sum, significant and strong relationships were found between the total EDE-Q score with appearance in sport, and with thin-fat self-evaluations in both daily life and sport, while significant moderate relationships were found for the remaining above mentioned variables.

[2] When the Wilcoxon tests were computed for the sample without the athletes who participated in other than aesthetic and endurance sports, the tests results were similar to the results that were reported in this manuscript.

Table 4.4 Spearman rank order correlations between EDE-Q total score and contextual body image

		Daily life				Sport			
		Appearance	Muscularity	Thin-fat self	Thin-fat others	Appearance	Muscularity	Thin-fat self	Thin-fat others
Daily life	Appearance		.27	-.40**	-.11	.77**	-.32*	-.42**	-.21
	Muscularity			-.13	.11	.28*	-.06	-.09	.05
	Thin-fat self				.60**	-.40**	.67**	.79**	.58**
	Thin-fat others					-.05	.43*	.54**	.76**
Sport	Appearance						-.30*	-.47**	-.23
	Muscularity							.72**	.58**
	Thin-fat self								.74**
	Thin-fat others								
EDE-Q		-.47**	-.04	.52**	.12	-.51**	.42**	.61**	.18

*Note. * p < .05; ** p < .01*

Table 4.5 Summary of standard multiple regression for predicting disordered eating

	B	*SE B*	β	*Sig.*	Part	SP^2 [a]
Daily life appearance	.42	.78	.08	.591	.047	.00
Daily life thin-fat self	-2.08	1.12	-.30	.070	-.162	.03
Daily life thin-fat others	-1.48	1.25	-.17	.245	-.103	.01
Sport appearance	-.23	.21	-.17	.278	-.096	.01
Sport thin-fat self	-4.85	1.15	-.75	.000*	-.366	.13
Sport thin-fat others	4.09	1.18	.57	.001*	.302	.09

Note. This regression analysis was conducted with transformed variables. When negatively skewed variables (e.g., daily life thin-fat self) are manipulated, the interpretation reverses the original scale, with lower scores now implying perceiving oneself as too fat and higher scores as too thin. Subsequently, the minus sign for daily life thin-fat self indicates a relationship with EDE-Q in the opposite direction of that with positively skewed variable daily life thin-fat others

[a] SP^2 = squared semi-partial or Part correlation coefficients

** p < .05*

In Table 4.5 the results of the standard multiple regression analysis are presented with contextual body image as a predictor of eating disorder symptomatology, measured by the EDE-Q total score. Separate regression analyses showed that daily life body image components explained 43.6%, while athletic body image components explained 63%. In both contexts, significant unique contributions were found for appearance, thin-fat self, and thin-fat others. When combining these results into one regression analysis, the included body image variables together explained 68.1% of EDE-Q variance and reached statistical significance, $F(6,42) = 14.975$, $p < .0005$. The adjusted R square value was .64. No significant effect was found for BMI and fat percentage, $F(2,37) = .565$, $p = .57$. From Table 4.5, it can be seen that the largest beta value was -.75 for thin-fat self in sport, which was one of two variables making a statistically significant unique contribution to the equation. Besides thin-fat self in sport, thin-fat others in sport also significantly contributed to disordered eating variance. Part correlation coefficients were -.37 and -.30, respectively, indicating unique contributions of 14% and 9% to the explanation of EDE-Q variance. Thin-fat self in daily life contributed 3% to the equation, but did not reach the significance level of $p < .05$.

General discussion

The purpose of the present study was to gain insight into the role of body image in athletes' disordered eating by taking into account the body image sensitivity to different contexts. Because existing questionnaires were not suitable for measuring the body image of athletes in different contexts, the CBIQA was developed. The validation results showed that its validity and reliability appeared to be quite satisfactory[3]. The outcomes of the factor analyses in Study 2 were quite similar to those in the general sample in Study 1, implicating that it seems quite common to divide athletes' body image into the dimensions appearance, muscularity, and thin/fatness. Although athletes' self-evaluations often equal the perceived opinions of others on thin/fatness, particularly in sport, the results also seemed to illustrate that these could also be treated as two different components which was already suggested by others (Cash, 2000; Loland, 1999). Future research should include larger samples to investigate whether these findings could be replicated and generalized to other samples (e.g., male athletes, non-athletes, in other countries of origin).

[3] Even so, we do not want to leave unmentioned the weaker correlations with external measures of body image component 'muscularity'. Although lower correlations with the Somatomorphic Matrix were expected as the Matrix measures body size appraisals rather than body evaluation, future research into external validity should also consider including a more similar instrument such as the Drive for Muscularity Scale (McCreare & Sasse, 2000) or using the computer version of the Somatomorphic Matrix that is known to be more reliable than the paper-and-pencil version we used in the present study (Cafri et al., 2004). More importantly, since muscularity is a rather broad concept referring to muscular tone, muscular strength as well as muscle mass which could be valued and evaluated differently, particularly in the contexts of daily life or sport, future studies should also consider using a more specific conceptualization.

In the present study it was demonstrated that high performance women athletes with disordered eating were significantly more negative about multiple body image components in both contexts than athletes without disordered eating. This is in agreement with the fact that a negative body image is a very potent, well-supported risk factor (Jacobi et al., 2004). Women athletes with disordered eating perceived themselves as fatter than women athletes without disordered eating, yet they did not significantly differ on actual weight characteristics. In addition, although the impact of perceived weight-related opinions of significant others for body image and dieting was clearly evidenced in the present study, as well as in others (e.g., Berry & Howe, 2000; Sundgot-Borgen, 1993), in the present study, athletes with disordered eating did not perceive significantly more negative opinions of others either. Nevertheless, they might somehow be more attentive or sensitive to these opinions and subsequent weight-related pressures, and, as a result, might have internalized prevailing body ideals to a greater extent. These suggestions should be further investigated in future studies, including phenomena such as competitive thinness, and attributing success and failure to issues such as weight, shape or appearance that could be of crucial influence.

Another important framework in this respect is that of social comparison theory (Festinger, 1954) in which social comparison is defined as taking an external frame of reference by comparing oneself with others for self-evaluation or self-enhancement. Recently, research has turned to the concept of body comparisons as a mediator between socio-cultural pressures to be thin and body dissatisfaction (Berg et al., 2007). Two types of body comparisons seemed highly relevant: upward comparisons with better-off individuals, in this case women who meet socio-cultural ideals of attractiveness, which typically leads to negative consequences, and downward comparisons with worse-off persons who do not meet this beauty ideal, which may lead to the opposite (Berg et al., 2007). Following the "Big Fish Little Pond Effect" (Marsh, 1998), when high performance women athletes compare their thin and lean bodies to that of other average usually worse-off women in daily life more positive body perceptions would be the result. Jansen, Smeets, Martijn, and Nederkoorn (2006) showed that there appears to be lack of self-serving bias in patients with eating disorders, as they are typically looking on the positive body aspects of others while focusing at the negative body aspects of themselves. This would implicate that athletes with disordered eating, who are more dissatisfied about their body in both contexts, disregard opportunities for downward comparisons in daily life while using upward comparisons in sport. Future studies should further explore athletes' body comparisons in daily life and sport, and possible differences between athletes with and without disordered eating in this respect.

The present results also showed that women athletes perceive themselves differently in sport than in daily life. As expected, women athletes appeared to have a more negative athletic body image than daily life body image, although it should also be noted that this was more pronounced for athletes without disordered eating. These results seem to be in

agreement with the concept of "body satisfaction transiency", referring to dynamic and contextual views on body image that athletes often experience different levels of body satisfaction in sport and daily life (Krane et al., 2001; Loland, 1999; Russell, 2004). While previous qualitative studies in so called "masculine sport types" such as rugby found that women athletes' body satisfaction decreased off the pitch (Follo, 2007; Russell, 2004), we on the other hand came across women athletes who were more positive about their body in daily life than in sport. These differences are likely driven by sport type possibly in relation to cultural beliefs. From a socio-cultural perspective, the athletes in the present study participated in (aesthetic and endurance) sports in which leanness and low weight are considered to be important. Hence, their bodies are representatives of our cultural body ideals and fit within our socially constructed definitions of beauty and femininity (Krane et al., 2001; Loland, 1999; Russell, 2004). In leanness sports, however, women athletes need to struggle to fulfill the stricter bodily demands of their sports culture. Indeed, the present results indicted that while in daily life the perceived opinions of others were towards too thin, in sport the opinions of others were towards too fat, which parallels the direction of the self-evaluations of the athletes in the successive contexts. Furthermore, it is also known that women are more critical about themselves in situations where their bodies have greater exposure or when they are in body-focused situations (Haimovitz et al., 1992; Tiggemann, 2001), which might be more prevalent in sport, particularly in aesthetic and endurance sports. Not surprisingly, most high performance women athletes in the present study seemed to have a more negative athletic body image than daily life body image.

Moreover, the results showed that the athletic body image strongly contributed to eating disorder symptomatology. More specifically, the athletes' self-evaluations about shape, weight and fat percentage and the perceived opinions of others on these aspects appeared to be only significant factors uniquely explaining 14% and 9% of the EDE-Q variance, respectively. These results support the idea that athletes seem to be specifically driven towards dieting and pathogenic weight control due to the demands of their specific sport and beliefs that "thin is going to win" (De Bruin et al., 2007; McNulty et al., 2001; Sundgot-Borgen, 1994a; Torstveit et al, 2008). It seems as if most athletes have a functional orientation towards their bodies and interpret their bodies, and subsequent dieting behaviors as tools for successful performance (Loland, 1999; Russell, 2004). On the other hand, although these athletic body image components were the only significant factors in the regression model, their contributions turned out to be rather limited. Moreover, thin-fat self-evaluations in daily life also seemed to contribute to the equation although it did not reach significance. When high correlations exist between two independent variables, much shared variance is statistically removed when they are both included in the model. Even though the necessary statistical condition of multicollinearity was met in the present study, the non-significant results of daily life body image components might also have been caused by the overlap between independent variables in the model and subsequent large standard errors (Pallant, 2005; Tabachnick & Fidell,

2007). Subsequently, daily life influences in athletes' disordered eating cannot be excluded with our current research design. Future research should further explore body images in sport and daily life, particularly in athletes with disordered eating.

Limitations of the present study were its sample size and constitution. With larger samples, sample size requirements of statistical analyses would be met more easily (Tabachnick & Fidell, 2007). Unfortunately, the number of Dutch high performance athletes is not that extensive. In addition, high performance sport in the Netherlands is organized privately and decentralized instead of in college universities or high schools, therefore, athletes are less accessible for research, let alone, women athletes suffering from disordered eating who want to come forward with this. Besides 12 high performance women athletes with disordered eating and their 12 matched controls receiving sport psychological treatment or dietitian support, we needed to extend the sample with a group of at-risk athletes who were not professionally diagnosed in advance. Following this procedure could have resulted in the possibility of false negatives in our control group. Yet, the 25% of high performance women aesthetic athletes in the present study who were classified as suffering from disordered eating seem comparable to the numbers found in similar samples (Sundgot-Borgen, 1993; Torstveit & Sundgot-Borgen, 2004). Moreover, the 100% match between the clinical classification of the professionals and our own disordered eating screening results inspires confidence in the appropriateness and reliability of our diagnostic screening procedure.

In conclusion, the present findings of situational effects in body dissatisfaction should not lead to underestimating the role of personal factors in body satisfaction (Tiggemann, 2001). Subjective body evaluation most likely has both stable and dynamic components (Haimovitz et al., 1993; Tiggemann, 2001). High correlations between situations or contexts indicate that there is cross-situational consistency which points towards a more general level of body esteem characteristic of the individual (Tiggemann, 2001). This seems particularly applicable to the athletes with disordered eating as they were more negative about their body in daily life and sport, and showed more congruence between the contexts than athletes without disordered eating. All in all, the contextual body image approach seems to be a promising framework for obtaining a better understanding of eating disorder symptomatology in athletes. At least 64% of the variance was explained by the relevant body image components from daily life and sport. Further investigation needs to take into account dynamic and contextual body image changes. It should also focus more closely on why certain athletes develop a more negative body image and how this could be prevented.

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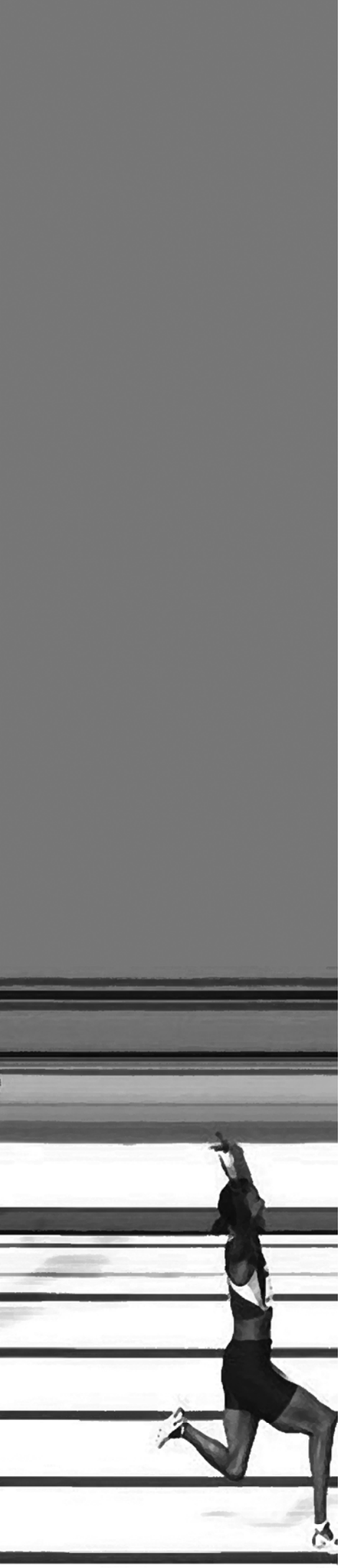

Chapter 5

“Tell me about your eating history”: Elite women athletes’ narratives and the meaning of their eating disorder

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Abstract

In the present ethnographic qualitative study, interviews were held with six elite women athletes who suffered or had suffered from an eating disorder. The (former) athletes were between 18 and 26 years of age, and participated at the (inter)national level in rowing, gymnastics, dance, cycling, and track-and-field. They were asked to share their stories on how they have dealt with food in their life and which factors from the daily life and sport contexts had contributed to their eating disorder history. In the present study various quotes illustrate our main finding that together with daily life influences, sport influences, in particular, appeared to contribute to the development of their eating disorder. The findings support previous quantitative results and offer specific cues for prevention and treatment of eating disorders in sport as seen through the eyes of elite women athletes.

Introduction

Results concerning the influence of body image on eating disorder symptomatology in athletes have been equivocal. In line with general findings in non-athletes, some studies found that body image disturbances seem to contribute to patterns of disordered eating in athletes (Berry & Howe, 2000; Byrne & McLean, 2002; Williamson et al., 1995). Other research has shown that the relationships between eating disorders and body image in athletes differ from those in non-athletes, leading to the conclusion that eating disorders in athletes might have their own characteristics (De Bruin, Oudejans, & Bakker, 2007; Smolak, Murnen, & Ruble, 2000). It was found, for example, that female gymnasts' dieting was not so much related to a negative body image, as was the case in controls, but rather to sport-specific variables such as perceived weight-related coach pressure and the attribution of success and failure to appearance, weight, and body shape. Whereas non-gymnasts believed that "thin is beautiful", gymnasts seemed more convinced that "thin is going to win" (De Bruin et al., 2007). Furthermore, it was suggested that body satisfaction of athletes "on and off the pitch" is transient (Russell, 2004); that is, in daily life athletes might realize that they look good and thin enough, yet in sport they might believe that a thinner body is needed for performance enhancement (Loland, 1999). These suggestions were largely confirmed in a quantitative study into the influence of contextual body image in daily life versus sport on high performance women athletes' disordered eating, showing that particularly athletic body image contributed significantly to eating disorder symptomatology (De Bruin, Oudejans, Bakker, & Woertman, 2009). However, as quantitive research did not provide insight into development processes, qualitative research concerning the views of women athletes could clear up the contributions of both contexts to the development of eating disorders and the processes through which this occurs. The present study provides a first attempt to do this, and addresses the uniqueness in the development of eating disorders in athletes.

For understanding the phenomenon of eating disorders in athletes, distinguishing between the contexts of daily life and sport seems useful (De Bruin, Oudejans et al., 2009; Follo, 2007; Loland, 1999). This distinction between daily life and sport can also be found in the four major explanations that have been postulated in the literature to account for the development of eating disorders in women athletes (Hausenblas & Carron, 1999). According to the first explanation, athletes experience societal pressures to be thin and to possess a fit physique. Moreover, women athletes appear to be more vulnerable to eating disorders than their non-athletic counterparts due to additional stress associated with the sport environment (Byrne & McLean, 2002; Sundgot-Borgen, Skarderud, & Rodgers, 2003). The second explanation explicitly focuses on task and socially related pressures within the sport arena which are associated with competitive demands and beliefs that low body weight improves performance, encouraging athletes to turn to unhealthy eating and weight control (Hausenblas & Carron, 1999). Several sport-environmental influences have been put forward, such as weight-related coach pressure (De Bruin et al., 2007; Kerr,

Berman, & De Souza, 2006; Sundgot-Borgen, 1994a; Williamson et al., 1995), social influences by peers or team-mates (De Bruin, Bakker, & Oudejans, 2009; Berry & Howe, 2000), and the motivational climate the coach and/or parents have created (De Bruin, Bakker et al., 2009; Duda & Kim, 1997). According to the third explanation, it is excessive exercise in itself that plays a causal role in the development of eating disorders (Madison & Ruma, 2003; Sundgot-Borgen, 1994a). The fourth explanation focuses on non-symptom psychological risk characteristics, such as perfectionism and achievement motivation (De Bruin, Bakker et al., 2009; Haase, Prapavessis, & Glynn Owens, 2002; Kerr et al., 2006), which may have enabled the athletes to succeed in their sport but also placed them more at risk for eating disorders (Byrne & MacLean, 2002; Sundgot-Borgen, 1994a).

Not all athletes develop eating disorders and the question arises why some athletes do while others do not (Sherman & Thompson, 1999), subsequently another dimension was added as theoretical framework of the present study. It has been suggested that eating disorders only occur in athletes who are predisposed to such disorders and that predisposing factors may contribute to an athlete's vulnerability. Whereas certain predispositions will lead in some athletes to the development of eating disorders, others will be discontent with their bodies and just diet, while yet another group may develop other psychopathologies that do not include eating disorders (Sundgot-Borgen et al., 2003). Whether a disposition will manifest itself as an eating disorder will depend on the precipitating factors, that is, the eliciting or situational factors that may be considered as the origin of their disturbed eating behavior (De Cuyper, 2006). In this respect, Norwegian elite athletes with an eating disorder have brought forward the following trigger factors: prolonged periods of dieting or frequent weight fluctuations, a sudden increase in training volume, and stressful events in or outside sport (Sundgot-Borgen, 1994a). In addition, there are maintaining or reinforcing factors that somehow perpetuate the disorder, such as initial rewards and improved performance (De Cuyper, 2006; Sundgot-Borgen et al., 2003).

Another more underlying question here is whether athletes with eating disorders would also have gotten their eating problems when they would not have had their sporting career or whether it is the sport participation that somehow caused their problems (Sundgot-Borgen et al., 2003). In other words, does athletes' eating disorder symptomatology mainly originate from the context of sport, the context of daily life, or both (De Bruin, Oudejans et al., 2009)? It is not unlikely that both contexts contribute to the development of eating disorders in athletes and that all four theoretical explanations have some validity. Therefore, these elements were all included in the theoretical framework of the present study. For the purpose of eating disorder prevention, more insight is still needed in the specific roles of both domains and in which way the domains interactively contribute to disordered eating.

So far, studies into risk factors for the development of eating disorders (e.g., Sundgot-Borgen, 1994a; Williamson et al., 1995) have been primarily conducted with cross-correlational quantitative research designs which only permit determination of statistically significant associations and assessment of so called risk correlates (Jacobi et al., 2004). Because it is unclear for many of these risk factors whether they preceded the onset of the eating disorder, it is impossible to determine whether they are triggers, symptoms, maintaining factors, or merely eating disorder consequences (Jacobi et al., 2004). To help build our understanding of the development of eating disorders in athletes, qualitative studies could provide rich detail at an individual case level (Byrne & McLean, 2002). Whereas quantitative approaches do not incorporate the personal meaning of the experience, the narrative approach "is concerned with subjectivity and experience, that is, with coming to grips with how a person thinks or feels about what is happening to him or her" (Crossley, 2000, p. 531).

The aim of the present study was to deepen our understanding of the processes through which athletes have developed their eating disorder patterns and to identify how the contexts of daily life and sport contributed to their eating disorders as seen through the eyes of elite women athletes. Based on the relevant daily life-sport distinction as well as the four postulated explanations for eating disorders that were found in the literature, we distinguished between individuals (who) and circumstances (what) in daily life and sport, and included a variety of cultural, sport-environmental, biological, and individual factors in the theoretical framework for this study. Moreover, the distinction between predisposing, precipitating, and perpetuating factors was incorporated in the theoretical framework, taking into account differences between triggers, symptoms, maintaining factors and consequences of eating disorders.

A major methodological issue in studying eating disorders is the fact that people can be dishonest about themselves because they experience feelings of shame, self-blame, or fear and, therefore, try to hide their inappropriate eating and dieting patterns. Athletes could be even more afraid to tell their story because they have great fear of jeopardizing their sports career once the truth has been told (Sundgot-Borgen, 1994b). In this respect, it has been concluded that qualitative research shows more reliable and valid information on eating disorders after displaying a significant underreporting of eating disorders among athletes in comparing survey data with clinical interviews (Sundgot-Borgen, 1993). To gain open and honest responses, it also seems essential that researchers develop trusting relationships and that they build rapport (Krane & Baird, 2005). According to Krane and Baird, researchers who are interested in sensitive issues in sport such as unhealthy eating behaviors would therefore benefit greatly from doing research within an ethnographical framework. By entering into close interaction with people in their everyday lives, ethnographers can better understand the beliefs, motivations and behaviors of their subjects. Therefore, in the present study, using interviews, an ethnographic approach was used to conjure the personal meaning of the experiences of six women athletes who (had)

suffered from an eating disorder. The first author has met or worked with these athletes during sport psychological activities over the past seven years. Following Sundgot-Borgen et al. (2003), only athletes who had received eating disorder treatment were included. The present study further investigated the contributions of sport and daily life to eating disorders in elite women athletes, and particularly focused on precipitating, triggering and maintaining factors according to the views of the athletes.

Method

Participants

Participants were six (former) elite women athletes between 18 and 26 years of age, who participated at the (inter)national level in aesthetic, weight class, or endurance sports which are known for their elevated risk of eating disorders (De Cuyper, 2006). More specifically, they participated in gymnastics, dance, track-and-field athletics, cycling, and rowing. Of the two athletes who participated in rowing, one is referred to as "former rower" because she had terminated her rowing career. In fact, the gymnast, track-and-field athlete, and former rower terminated their elite athletic career one to two years before the interview was held. Most athletes were recognized as talents at a relatively young age and specialized in their sport when they were between 10 and 14 years old. All athletes developed their eating disorder between the ages 11 and 21 years. At the time of the interviews, the dancer, track-and-field athlete, and rower were no longer in treatment and reported to be currently free of eating disorder symptomatology. They were previously diagnosed with an eating disorder not otherwise specified (EDNOS) (anorectic, not meeting the underweight criterion), bulimia nervosa (BN), and EDNOS (bulimic, only compensating with dieting or exercise), respectively. The gymnast, former rower, and cyclist were still in treatment and suffered from BN (purging type), BN (non-purging type), and EDNOS (bulimic, not meeting the frequency criterion), respectively.

As already mentioned, the first author worked with the participants during sport psychological activities over the past seven years in which it became apparent that the athletes were suffering from an eating disorder to some extent. Five of them initiated contact because they were interested in following a general mental training program or treatment for their eating disorder. With three of them a program started, while two were referred to specialized treatment. The number of sessions with the athletes varied from one to 22.

Procedure

All women athletes were asked by email to participate in an interview about their eating and dieting habits during their life and the factors that had influenced these habits. They were told that they were approached because these themes had emerged during our meetings. They were told that participation was strictly confidential and voluntary. All women agreed and subsequently a date and place was set for each interview. Three

women were interviewed at their own home, while the other three interviews were held in the first authors' working office. Before the interview started, the women received an oral explanation of the purpose of the study. The voluntary and confidential character of the study was repeated and it was explained that they could resign from the study at any time without any consequences. They were asked permission for recording the interview and they were told that all details that would possibly lead to exposure of their identity would be excluded from the results. In addition, the possibility of consulting the first author or another psychologist after participation was explicitly mentioned in case the participants had any questions or needed professional support. All the above mentioned information was written down in the informed consent form that all participants signed. The interviews lasted between 60 and 90 minutes. The research design was approved by the Ethics Committee of the research institute.

Materials

Interview guide (see Appendices)

A general interview guide approach was used for which the interviewer (first author) planned to discuss several topics but did not have an a priori format for doing so. The interview guide contained a predetermined list of topics and questions based on previous research concerning disordered eating in high performance women athletes and several eating disorder treatment files. The themes in this interview guide reflected the theoretical framework of the present study. The themes were not necessarily discussed in the prespecified order and the questions asked were based on the respondent's discussion, following a phenomenological interview method (Dale, 1996). Phenomenological inquiry "uses qualitative and naturalistic approaches to inductively and holistically understand human experience in context-specific settings" (Patton, 1990, p. 37). In this study this concerned the development of athletes' eating disorders in daily life and sport contexts. Whenever participants seemed to hold back or gave noncommittal answers, probing and detail oriented questions (Patton, 1990) were asked that would help in identifying the influences on their eating. To assess impact and to stimulate closure, the respondents were asked how they looked back on the interviews.

Data Analysis

The interviews were recorded with a digital audio recording device (Sony, ICD-BP150). These recordings were transcribed verbatim and the transcriptions were read by all authors to reflect on the daily life and athletic influences in the athletes' narratives. After reading the transcripts several times, significant statements that directly pertained to the topics being studied were extracted and the so called "meaning units" that emerged from these statements were then manually put into clusters of themes (Dale, 1996). Both case analysis and cross-case analysis were conducted to illuminate key issues and influences on eating disorders in sport. These analyses were inductive as patterns, themes, and categories of analyses came from the data, while the daily life-athletic dinstinction was deductively

imposed on the data prior to data analysis. To enhance the quality of analysis, we also looked for negative cases. In addition to this content analysis (the whats), we also concentrated on how the stories were told following a narrative practice approach (Sparkes & Partington, 2003). To increase the credibility of the data, investigator triangulation was used (Patton, 1990): three researchers discussed the identification and structuring of emerging themes, subthemes, and quotes, along with the use of a "critical friend", until consensus was reached (Sparkes & Partington, 2003). The coding accuracy in terms of level of agreement between the coders was established at 90 to 95%.

Results

The results are presented in three different sections. First, factors in the context of daily life factors are presented, followed by several sport-specific factors. In the final section, several factors that affected the athletes in both contexts are discussed.

Daily life factors

1. Family. For some athletes, such as the gymnast and the dancer, family influences appeared to be entirely absent. For others, family members acted as a key factor in the development of their eating disorder. The rower and former rower mentioned having an older sister suffering from an eating disorder and acknowledged the negative influence that their sisters' presence has had on their lives. The rower mentioned that there was a lot of rivalry between her and her sister: "We were sisters but rivals too. When she lost weight, I really liked her looks and the attention she received. At a certain point, I joined her. […] I could really annoy her by eating even less than she did". The former rower stated: "It is not that there was some kind of competition, me consciously imitating her or so, it was just that because of her everything in our home was always revolving around food". The track-and-field athlete, former rower, and cyclist recognized their mother as unhealthy role model:

> My mother has an outstanding eating pattern, she eats almost the same everyday and she doesn't think about it, or at least I think she doesn't. We never have sweets or candy, my mother never wants that because "that is not necessary". If she would just take a biscuit or something, then it wouldn't be so terrible for me to eat that. Perhaps I wouldn't have thought about what I ate all the time then. (Cyclist).

For the track-and-field athlete, her mothers' weight-related pressure also extended to the sport context, as was illustrated by the following:

> My mother is very competitive, she invested a lot in my athletic career and she expected something in return. She expected me to perform, to train hard, which also included having a certain body type. She made the connection between my body, eating, and sport. I couldn't live up to her expectations, and my performances deteriorated when I was about 17 years old. In everything she said, I felt rejection. "Is it sensible to eat that?" for me meant: "See, I am too fat, I am not doing the things how I ought to".

2. Peers. The peer influence from school friends in daily life was perceived as rather limited. The respondents expressed to be quite amazed by the fact that dieting, food preoccupation, and body image issues did not play a very significant role among their peers at high school. "Interviewer: 'How did dieting etc play a role among your friends?' Gymnast: "Not, that was also so strange for me to notice. It did not play a role in their lives, not at all, no. They were just kids". Some examples of school friends or acquaintances suffering from anorexia or bulimia were given, but these influences did not affect the athletes. Another reply was that there were no friends in daily life, just friends (and influence) in the context of sport: "I did not have many friends, because I spent all my time in sports. I did not really take part in college life too. Of course we were together with a group of girls at the track, and there was rivalry everywhere".

3. Identity formation (body image). The athletes' body evaluations and body comparisons headed into three different directions. The track-and-field athlete indicated that in daily life she felt positive and secure about herself and her body in contrast to how negative she felt about herself in sport: "This was so much more important in the sport arena. In daily life, I was not so insecure, I was very sure about myself even, presumably because I wanted to compensate for the lack of confidence in sport". For the gymnast, dancer, and rower body comparisons in daily life did not play any role:

> Interviewer: "Did you also compare yourself with others in daily life?" Gymnast: "No, no, that didn't exist for me. My whole world was gymnastics. I still have the idea that I simply have to be below average. I cannot compare myself with average people so I keep on comparing myself with athletes. And then it is very hard to feel good about the way you are. I am working hard now to get that right".

The former rower and cyclist, in contrast, mentioned that they did compare themselves with friends in daily life. They wanted to be as thin as they were and always felt fatter. They reported to make "upward body comparisons" with better-off (read: thinner) individuals in both daily life and sport.

Table 1. Structure of themes concerning reported daily life influences on eating disorders (respondents in parentheses)

High order theme	First order theme	Raw data theme / influence
family	sister with eating disorder (r; fr)	competition (r)
		imitation (fr; r)
		becoming over aware of body and food-related issues (fr)
	restrictive mother (fr; c; a)	wrong example (c)
		body-related remarks (a; fr)
peers	friends (c; fr)	limited or no peer influence (a; r; g; d; c; fr)
	no friends in daily life, just in sport (a; r; g; d)	
identity formation	body image	negative body evaluation, fear of fat (c; fr)
		body comparisons: downwards (a), upwards (c; fr), or none (g; d; r)
		thin is beautiful ideal (r; fr)
		awareness of pubertal bodily changes (c)
transitions	from primary to secondary school (c)	experiencing a loss of control and dieting structure (c; fr)
	to another country (fr)	
	pubertal bodily changes (c)	personal response of upward body comparisons

Note. (a) = track-and-field athlete; (c) = cyclist; (d) = dancer; (g) = gymnast; (r) = rower; (fr) = former rower

Table 2a. Structure of themes concerning reported sport influences on eating disorders (respondents in parentheses)

High order theme	First order theme	Raw data theme / influence	
identity formation			
	athletic body image (g; r; fr; a; c)	negative self-evaluations / perceived opinions of others (g; r; fr; a; c)	
		wrong body image (a; r; g)	
		body comparisons: upward (g; r; fr; a; c)	
		awareness of pubertal bodily changes (personal response) (r)	
		revealing sports clothing (fr; r; c; a; g)	
	athletic body ideal (g; r; a; c)	aesthetic (g)	
		performance-related (a; c; r; fr);	thin is going to win (c; a; r)
	athletic identity (g; d; r; a; fr)	exclusive athletic identity (g; d; r; a; fr)	that is somehow related to my eating disorder (g; a; fr)

Note. (a) = track-and-field athlete; (c) = cyclist; (d) = dancer; (g) = gymnast; (r) = rower; (fr) = former rower

Sport factors

1. Identity. The first sport-related category that was distinguished in the athletes' stories was identity, containing the sub categories athletic body image and athletic identity.

a. Athletic body image. The respondents recognized increased body awareness in the sport arena that led to a very negative body evaluation and disturbed body image in sport:

> I always felt fatter than I really was. I was also extremely focused on that. When I looked back at our competition videos, I just saw my legs; I was only occupied with that, not with what I did but with my appearance, or being thin or fat, and comparing myself with other gymnasts. (Gymnast).

b. Athletic body ideal.
For most athletes, however, body evaluations and ideal were not only related to aesthetics and appearance, but also or particularly to performance:

> Due to the body comparisons with other athletes, I did not feel good enough. Because in my experience I could not live up to that, as everyone was thinner, stronger and more beautiful than me. I was always occupied with the others, watching how thin they were. Before the start, I was thinking things like: "If she is competing against me, I definitely cannot win. I don't have such a thin body."[…] I did have a certain ideal weight, but never reached it. I was, and still am actually, convinced that if I would weigh 56 kilos, everything on the track would turn out for the better. In my mind, training was merely for compensating my eating or a way to lose weight but not to enhance my performances. My weight determined my performance; that was the driving force. Interviewer: "What happened if you failed?" Athlete: "Then I attributed that to being too heavy". Interviewer: "What happened if you succeeded?" Athlete: "That acted as a kind of confirmation for myself, who I was and how I looked, more than the amount of training I had put into it". (Track-and-field athlete).

According to the athletes, their negative body evaluations were related to the general weight-related sports culture and the inherent lean body ideal that is common in sport: "The image was just always that gymnasts had to be small, thin and not too heavy, and that image got a hold of me too... Just how it was told, but also among each other...It's simply the culture" (Gymnast). In the athletes' stories, it became apparent that their attitudes towards weight and performance were strongly related to the behaviors and remarks of others, as described below in the section "environmental pressures".

In addition, all athletes brought up the issue of tight and revealing sports clothing which heightened the athletes' body awareness, deepened their negative self-evaluations, and affected their eating behaviors. The athletes were highly aware of their body and of the (perceived) opinions of others in particular:

> I really do not want to be too fat when I am sitting on my bike, because it looks disgusting when the clothes I wear are too tight. When I feel too fat, I try to eat less that day. In particular at the cycling track, it is not relaxed…because there the audience can take a close look at you. (Cyclist).

c. Athletic identity. When the (former) athletes looked back at their active sports career, several athletes noticed that they possessed an exclusive athletic identity, which was somehow related to their eating problems:

> When I had quit, I was thinking: "jee, who am I?", because I had always thought of myself as the athlete, and besides that hardly anything else existed. My identity resembled how well I performed at the track. So the drive to perform was very extreme because I wanted to feel good about myself and I also wanted my environment to see me as good. For a while, I was afraid to tell people that I had quit, because then I would have dissolved or so.
> (Track-and-field athlete).

> Well, you are very much seen as a gymnast, you do not have your own identity. I truly felt that,"who am I, how do I truly think about things?" It was all very confusing to me. Food provided a solution for this opacity. (Gymnast).

2. Environmental Pressures

Two types of environmental pressures that affected their eating disorder were found in the athletes' stories, namely performance pressure and weight-related pressure.

a. Performance pressure. Performance pressure was identified as a very strong influence by all athletes, except for the former rower. Performance pressure was a common characteristic within them as well as within their (sports) environment:

> Well, the dance environment, … of course it comes down to how difficult you make it for yourself, because I was very difficult to myself, and not everyone at the academy was having an eating problem, yet it pressures you. They do want to see you perform well. That is just how it is. Naturally, you want to see yourself perform too, but that [performance pressure at school] made it worse. (Dancer).

Table 2b Structure of themes concerning reported sport influences on eating disorders (respondents in parentheses)

High order theme	First order theme		Raw data theme / influence
environmental pressures	performance pressure (r ; d ; g ; c ; a)		
	weight-related influence and pressure by (r; fr; d; g; a; c)		inappropriate environmental response to pubertal changes (r; g; a)
		coaches (g; d; r; fr; c)	positive support, awareness (c; r; g) positive comments on weight loss (c; r) negative influence of coach' remarks (g; d; r; fr; c; a) weigh-ins and body measurements (c; r; fr; a; g) inappropriate coaching (a; d; g; c)
		other staff members (c; a)	dieting requests by sports physician (c; a)
		peers (r; c):	silent identification of others with problems (a; g; c) limited explicit influence (g; a; d; fr) influence due to talking, comparing and/or competing (a; r; c; fr)
	sport-task related influence and pressure (r; fr; d; g; a; c)	sport circumstances and training requirements	transition to elite sport (a; r; c; g) weight classes (r; fr) (loss/presence of) daily routines and healthy eating habits (r; c; fr; r) weight-related compensatory sport motivation (c; a; fr; r) mirrors (d) revealing sports clothing (fr; r; c; a; g)

Note. (a) = track-and-field athlete; (c) = cyclist; (d) = dancer; (g) = gymnast; (r) = rower; (fr) = former rower

The track-and-field athlete explained that in her case the performance pressure was imposed by her mother. The pressure was not just present in sport but also in other areas:

> 80% of my mothers' life was my athletic career. I always felt that pressure. First, it started through play, we went to the woods to run with the dog, but at a certain time she started timing me because I had to run faster every round, again and again. That was so typical for my mom, she is so competitive. [...] My older sister is handicapped, so at home my mother always told the others: "you have the opportunity, so go for it". Not only in athletics but also at school we had to perform maximally. I wanted to meet certain expectations but couldn't fullfil them. It took me quite some time before I saw through that and could speak out "I am now going to do what I want".

b. Weight-related influence and pressure. First, the sport context in general was taken as a context in which it was quite easy to lose weight. In this respect, several athletes mentioned that sport participation was often used as a compensatory weight loss method: "And even though you don't feel like cycling, you go because it helps you to lose weight. That is your motivation to cycle then. Or if you have eaten much too much that day and therefore you'll train". Second, weight-related pressure seems to be inherent to certain sports, such as rowing. Both rowers acknowledged the presence of weight-related pressures due to the existence of weight-classes in their sport:

> For indoor competitions, they will add time to your results if you are above 75 kilos and below that you have advantage. After the competition, your time and weight is put on the internet. That was so stressful for me. I had not weighed myself for a half year, because that is better for me, and now I had to weigh myself again. While others were worried about the competition, I just worried about going to be weighed again and my weight being published for the whole country. It just gives you stress but also establishes a certain order in the team. It was an issue for two weeks for all women.

Furthermore, weight-related pressures in sport came from coaches, other staff members, and/or peers.

Coach influence. Although three athletes also mentioned the presence of positive coach influence on their eating disorder during their athletic careers, mainly negative examples of their coaches' influence were given.

i. Negative coach' influences: weight-related pressure and comments. All athletes could recall several negative experiences with coaches who put too much one-sided pressure on the athletes' weight, shape, or appearance. The most extreme example is given below:

> Before I went to this elite gymnastic association, I already heard things like "you cannot eat candy anymore" and so on. When I started, I felt fatter because the other girls were so occupied with that, and, at that point, I was not. From the moment that we were put onto the balance to weigh, it started to become messy. And when the other trainers came, it became even worse. During a three week international practice abroad, we were not allowed to have contact with our parents. We were hardly allowed to eat anything and were really hungry. Since then, I was always focused on it and I got even more messed up. I was 11 years old, weighed 33 kilos and we were still told that we were too heavy. It was so brutal, I got a whole different image of myself and I kept this until now actually. (Gymnast).

Parallel to the athletes' experiences, also among the trainers/coaches the weight-related pressure seemed to originate both from performance expectancies as well as from aesthetic ideals. Frequently, the weight-related coach pressure manifested itself in comments on their weight which had far-reaching consequences for the athletes:

> When I started to concentrate on the wrong things, my appearance and my body, I must say that that was triggered by my ballet teacher. Five lessons in a row, he clamped my waist, touching my fat, saying: "What's this, I am not used to that from you". At first I replied: "That is just skin, look around you, I am really not the one who should be reminded of that". But he kept on doing it, five lessons in a row. Perhaps, because I was already insecure I started focusing on my body. I do not claim that it was his fault as I decided to lose weight all by myself. But it definitely started something. (Dancer).

The track-and-field athlete not only reported weight-related comments by some of her own trainers, but also mentioned intimidating behaviors of other trainers: "When my opponents' trainer asked me before the start: 'Did you gain some weight?' I was immediately lost, swept away entirely. No, I was not mentally tough. Those remarks were not always meant that way but deeply affected me".

ii. Weigh-ins and measurements. Several athletes brought up the negative experiences of group weigh-ins that were introduced by their coaches:

> When they got the feeling that we started to grow, we had to weigh ourselves four times a day: before and after morning training, and before and after the afternoon training. Then many things happened with me. I started to experiment when I weighed the least. I ate very little in the morning, did not drink anything, and of course I didn't drink during the training, because if you gained weight during the training, the trainer got the impression that you didn't train hard enough, so you had to lose weight. Then I went to school; at

> ten o'clock I had finished all my food and didn't eat the whole day anymore. At night I started to drink, because I presumed that the fluids would have left my body the next morning. Very strange thoughts got a hold of me then. […] When someone was too heavy, they had to run or cycle to lose weight and were allowed to train only if they had the appropriate weight again. (Gymnast).

According to the track-and-field athlete, weigh-ins did occur and were a horrible for her, but as it was not a widespread phenomenon, its influence on her eating problems was rather limited: "In athletics, it is mainly the athletes who are focused on their weight".
In addition to the weight-related pressure, body remarks, and weigh-ins, several athletes told that coaches reinforced and normalized their dieting behaviors, which acted as a maintaining factor.

iii. Inappropriate coaching. As already mentioned above, several athletes, among others the gymnast, talked about coaches who overstepped the limits: "So many things have happened to me, concrete things, such as verbal abuse, being ignored, painful things so to speak…". There was also some mentioning of inappropriate coaching behaviors which at that time the athletes did not problemise but retrospectively their opinion had changed:

> Our group of young women athletes was trained by two younger men, and there was a lot of rivalry and competition for their attention, which, if I look back at it now, was very unhealthy, definitely for me. One of them drove us home, and everyone wanted to be the last, as that girl would be alone with him and could talk with him in the car for one hour. (Track-and-field athlete).

Influence by other staff-members. In addition to the coach' influence, the cyclist and track-and-field athlete also mentioned weight-related pressure or comments of other members of the sports staff, in their case of the sports physician, albeit that the influence seemed very limited and in most cases even absent. According to the athletes, a more important influence next to the coach was that of peer athletes.

Influence by peer athletes. Peer influence in sport seemed present in a number of different ways, either explicit or implicit. There were examples of sports environments, for example in cycling and rowing, in which there was a lot of weight-related talk among the athletes. In the present study, a taboo on talking about dieting and the struggles with food became evident, although at the same time athletes felt or knew that they were definitely not the only one: "Sure I heard that there were other gymnasts who vomited to lose weight. It was too difficult to talk about that with them. It is already such a huge problem for me, let alone the problems of others". The track-and-field athlete talked about implicit peer influence as a result of body comparisons and competitions regarding food-intake:

> I was very focused on myself, yet I was always looking for others with similar experiences. I noticed many athletes in my environment, but they did not want to talk about it. The topic was a real no-go, and I was not assertive enough to start talking about it. At international practices, I recognized things, such as that during training if I did not eat then my teammate did not eat either. That was an unspoken rule: "I eat what you eat and preferably less". It was also a kind of rivalry, on birthday parties et cetera; there are so many examples of that. Later on, we discussed it, but not at that time. It was so unhealthy when I look back. But I don't think that we really contaminated each other, we were struggling on separate islands.

Interaction between the contexts

In the final section, factors that affected the athletes in both contexts are discussed.
1. Individual characteristics. Several personality characteristics were brought forward that could be typified as personality variables which manifested themselves mainly in the sport context. Among others, perfectionism, ineffective stress-coping style, a general sense of vulnerability, and the need for structure were brought forward. Most athletes expressed symptoms of different forms of perfectionism (e.g., positive, negative, social), and some explicitly related these to their eating disorder:

> I sometimes wonder what kind of influence sport participation exerts. Whether there is a relationship between sports and my eating disorder. I have always exercised very intense. If I go on a holidays, my eating normalizes and I feel very relaxed. Because of my sport, I have to watch my eating very closely, you have to organize eating during training, you are always afraid that you didn't eat enough. But I think that I might have gotten it anyway. Because I possess the characteristics that I read about are typical risk factors. [Interviewer: Characteristics?]. Yes, perfectionism, wanting to be the best, being focused on others … (Rower).

Moreover, the eating problems seemed to escalate before competitions. Most athletes exhibited high levels of competitive anxiety and coped ineffectively with this by eating:

> If I had an important competition, I ate too much in advance because I was reluctant to compete, afraid of what lay ahead of me; just eating away the stress, stress about the others cycling much faster than me, about falling, or about not meeting other people's expectations about me. In a way you have decreased your chances of performing well, but on the other hand if it doesn't turn out okay you have a definite reason in your head for that. They say "you're so good" and then I think by myself, "you may say that but it is not true at all". And then if it doesn't work out, it is almost as if you deliver some kind of evidence that it is not true indeed. (Cyclist).

The ineffective, self-handicapping stress-coping style of overeating and compensating could also extend to stressful events in daily life. But as much of their lives happened in the sport context, most reported stressors were sport-related.

Furthermore, the athletes mentioned that their own mental vulnerability was also responsible for their eating problem. The track-and-field athlete: "For elite sport, I was a bit too vulnerable; I wasn't assertive enough, couldn't point out what I wanted, and didn't have any clear ideas about what I didn't want". Because of it, they couldn't stand the performance pressure or weight-related remarks of their coach or mother, for example:

> If you are superstrong and can think normally, you would have thought things like, "this is my body, who are you to interfere? I feel good". But I was just so manipulable. I adapted and did not have ideas of my own, did not have a strong personality yet. (Gymnast).

Another characteristic the athletes related to their eating disorder was their need for control and structure:

> It was just the general insecurity, the feeling that I did not have control over the situation, for example in dancing and singing. The food I could control and that's why I focused on that. I kept on doing it, because it felt so good that I was in control. And when I noticed that I started to lose weight, it made me feel successful. "There is at least something that I am good at". And that was the reason to continue, to want more and to keep in control. (Dancer).

Again, an interaction between the contexts of sport and daily life was illustrated. For the cyclist, for example, participation in elite sport took her away from family eating routines that acted as external standards on which she had based her eating because she had difficulties with her introceptive awareness of hunger. In contrast, for the former rower, sport provided the necessary structure to eating and dieting, so that right after terminating her athletic career and letting go of the accompanying eating schedule, her disordered eating worsened:

> Athletic participation is a clear lifestyle that dictated my eating. Since I am not an elite athlete anymore, I don't need to eat like I had to when I was an athlete. Now I need to think for myself what I want […]. It was a true search after I had quit. How often are you allowed to exercise, how much you need to eat…. I still have not reached my goal, eating what you feel like instead of what I think or relating it to the amount of exercise that I did that day. (Former rower).

2. Athletes' narratives on eating disorders. Collectively, a variety of factors from the contexts of daily life and sport were brought up by the respondents that somehow influenced the development of their eating disorder. Some athletes (i.e., the gymnast, dancer, track-and-field athlete) specifically pointed to the sport context as the origin of their eating disorder: "I don't think that I would have gotten an eating problem if I wouldn't have joined gymnastics, because I wasn't like this at all when I was young. Perhaps problems in another area, but I don't think with food" (gymnast). Others (i.e., the former rower, rower, and cyclist) believed that it was daily life from which their eating disorder originated and that "they might have gotten it anyhow". In either case, the athletes believed that the sport context maintained or even increased their eating problems:

> Sport determined my eating problem for 80%; the rest didn't really bother me. Funny, as sport was also what caused the most frustrations, conflicts, stress, and problems. […] Sport really maintained my eating problems. For a long time I didn't enjoy athletics, it was one big frustration. By choosing what I truly enjoyed, I could face my eating problems. When I thought "I simply quit", it was such a relief. When I quit elite sport, my eating problem was over too. Fortunately, after quitting I ran new personal records and I could let go of my ideal weight and eating lists. Then I could release the weight-performance link. (Track-and-field athlete).

In sum, the influence of daily life pertained to family influences and, for some athletes (i.e., the former rower and cyclist), to a negative daily life body image and upward body comparisons with their friends. Furthermore, a variety of individual personality characteristics were put forward that manifested themselves mainly in the sport context, through which the interactions between both contexts became evident. Sport exerted a negative influence on the identity level consisting of an exclusive athletic identity and a negative athletic body image. The negative body evaluations in sport were linked to the demanding performance-related athletic body ideals and subsequent beliefs of athletes and coaches that "thin is going to win" but also to upward body comparisons and the necessity of wearing revealing sports clothing. Moreover, environmental influences such as performance pressure, weight-related coach pressures and weigh-ins were put forward. All athletes ascribed an important role to the sport context in the development of their eating disorder.

Table 3. Structure of themes concerning individual influences on eating disorders (respondents in parentheses)

High order theme	First order theme	Raw data theme / influence
individual characteristics	genetics (r; a)	aunt with eating disorder history (r)
	self-description (r; d; g; a; c)	negative self-image (a; d; c;)
		self-criticism or blaming oneself/one's weakness for ED (r; a; d; c; g)
	personality (r; d; fr; g; a; c)	perfectionism (g; d; r; a)
		over competitive (r; fr; a)
		ineffective coping of competitive anxiety and other stress (a; d; c; g)
		general vulnerability: compliance/sub assertiveness (g; r; d; a; fr)
		need for control / structure *versus experiencing transitions in which control got lost* (r; d; c; fr; a)
	emotions and feelings (r; d; fr; g; a; c)	feelings of loneliness and isolation *versus inability to cope with emotions* (g; a; d)
		being home sick (r; a)
		low weight / dieting makes you feel good and successful (r; c; d; fr)
		doubts, stresses and pressures (c; r; g; d; a)
		inability to determine inner dietary standards and biological feelings of hunger *versus experiencing … transitions in which control got lost* (c; fr)

Note. (a) = track-and-field athlete; (c) = cyclist; (d) = dancer; (g) = gymnast; (r) = rower; (fr) = former rower

Table 4. Structure of themes concerning eating disorder narratives (respondents in parentheses)

High order theme		First order theme	Raw data theme / influence
narratives	story concerning eating disorder and sport	daily life	
		"I would have gotten it anyhow" (r; fr; c)	… yet the sport context worsened my ED (r; c; fr) … yet the sport context made it easy for me to lose weight (r; c) … and the sport context provided a healthy dieting structure (fr)
		sport	
		"I hold the sport context accountable for my eating disorder" (g; d; a)	… but ED is also related to my own personal vulnerability (g; d; a)
	general story	hero, recovery story (d; a)	
		chaos (c; g)	
		quest (a; r; fr)	

Note. (a) = track-and-field athlete; (c) = cyclist; (d) = dancer; (g) = gymnast; (r) = rower; (fr) = former rower

Discussion

The purpose of the present study was to deepen our understanding of the processes through which elite athletes have developed disordered eating patterns and to identify how the contexts of daily life and sport contributed to their eating disorder as seen according to the views of (former) elite women athletes. The results showed that the relationship between eating disorder symptomatology and the sports environment was clearly recognized by the elite women athletes themselves. Whereas some athletes specifically identified the sport context as the origin of their eating disorder, others believed that it was daily life from which their eating disorder originated while the sport context maintained or even increased their problems. In both cases, it also became evident that individual personality characteristics such as perfectionism, stress-coping style, their need for structure and control, or a more general mental vulnerability strongly influenced the athletes. These characteristics made it very difficult for them to deal effectively with certain changes and transitions, stresses and pressures, or disappointing results.

These individual factors, in addition to the identified family influences, could be designated as so called predisposing factors that made certain athletes vulnerable to the eating disorder (see also, Sundgot-Borgen et al., 2003). In addition, the women athletes brought forward the following precipitating factors: loss of daily routines and healthy eating habits, comments on their body by coaches or family, inappropriate coaching, and various environmental pressures regarding performance and weight. These results are in line with the trigger factors reported by Sundgot-Borgen (1994a). Furthermore, the present findings seem to corroborate the anecdotal evidence related to comments, behaviors, and weight-related pressure by significant others (De Cuyper, 2006; Krane, Greenleaf, & Snow, 1997; Jones, Glintmeyer, & McKenzie, 2005; Sundgot-Borgen, 1993; Sundgot-Borgen, 1994a). Relationships of eating disorders with intimidating and abusive coaches were previously reported by other researchers (Sundgot-Borgen, Fasting, Brackenridge, Torstveit, & Berglund, 2003). Finally, maintaining factors that were brought forward in the present study were: the loss of interoceptive awareness of hunger, intense fear of fatness, addiction to self-induced vomiting or training, being motivated for (extra) training out of weight-related motives, and positive feelings about successful dieting and being in control. These factors could be identified as known symptoms of eating disorders or anorexia athletica (APA, 1994; Sundgot-Borgen, 1994b). Among the sport-related maintaining factors that elicited dieting, bingeing, or compensatory behaviors were positive feedback from coaches about weight loss, deteriorating performances or negative (perfectionistic) performance evaluations, and competitive stress and not being able to cope with it effectively. Here, relationships were found with underlying weight-related causal attributions of success and failure (see De Bruin et al., 2007), referring to the beliefs of athletes and coaches that “thin is going to win” and that bad performance should be attributed to (alleged) overweight.

Another important maintaining factor appeared to be body image and, more specifically, negative body-evaluations and upward body comparisons. In this instance, it became clear that athetes described quite negative body evaluations in sport, which were expressed by the aesthetic, endurance as well as the weight-class athletes. These qualitative results seem to confirm the quantitative results from previous studies pointing towards athletic body image as an important factor in athletes' disordered eating (De Bruin et al., 2007; De Bruin et al., 2009; Follo, 2007; Loland, 1999). In the present study, for some athletes, negative body evaluations only existed in the sport context while expressing to be quite satisfied with their body in daily life or not to compare themselves with others in daily life at all. Others also exhibited negative self-evaluations and upward body comparisons in daily life and had developed negative body images in both sport and daily life. From some of the quotes it became clear that the awareness of pubertal body changes that often coincided with the specialization phase in the sport, and the subsequent inadequate personal (by the athlete herself) or inappropriate environmental (by their parents or coaches) responses to these biological transitions, acted as cumulative triggers for developing a negative body image and disordered eating patterns. Particularly in sports such as gymnastics and dance, which are seen as a sport for young girls in which athletes specialize at an early age (Malina, Bouchard, & Bar-Or, 2004), in puberty the goodness-of-fit between an athlete and her sport becomes challenged, subsequently increasing the risk for developing eating disorders (Monsma & Malina, 2003). Although the present study has been executed from a sport psychological viewpoint and did not directly measure biological factors, these results advocate including biological phenomena in future research and theoretical frameworks aimed at explaining eating disorders in athletes (Malina et al., 2004).

The present findings are in line with the results of the only other narrative study concerning eating disorders in athletes, executed by Sundgot-Borgen et al. (2003) who asked Norwegian elite athletes to consider the relationship between their eating disorder and their athletic careers. Some athletes, for example the gymnast and dancer in the present study, pointed towards sport as the context from which their eating disorder originated. To them, elite sport represented a high-risk culture that overemphasized body and nutrition and often included coaches who pressurized athletes to lose weight (see also Sundgot-Borgen et al., 2003). For a second group, eating disorder symptoms were partly related to stressful performing at the elite level and their eating disorder became a way of getting out of sports (Sundgot-Borgen et al., 2003). The relation between sport-related stress and increased eating disorder symptoms was also noticeable in the present study in the stories of the track-and-field athlete, cyclist, gymnast, and both rowers, as well as recurrant doubts about career continuation and actual career termination. Third, the narrative of "I might have gotten it anyhow" was found among athletes who described many general predisposing factors. In these three narratives, once more, interacting contributions of the daily life and sport contexts became apparent.

A second framework within the narrative tradition distinguishes three story types in patients' stories about their medical history, namely the stories of heroic recovery, chaos, and quest (Widdershoven, 2000). The story of heroic recovery is dominant in Western society and is the classical story in which the disorder is a temporary phase in a life that, apart from that, is healthy. The most famous Dutch example regarding eating disorders in athletes is the heroic recovery story of Leontien van Moorsel who suffered from anorexia nervosa during her cycling career, had to quit temporarily, but returned racing being recovered to eventually terminate her career after winning several Olympic gold medals. In the present study, a recovery story was told by the track-and-field athlete who fully recovered and performed even more succesfully. A "chaos story", in contrast, does not consist of a clear story line from bad to good, from diagnosis and treatment to recovery, but the situation could best be characterized as rudderless. In the present study, such a story type was told by the gymnast:

> So much has happened, I cannot understand it all yet. How can I explain, just concrete things, being yelled at, being ignored, painful things so to speak. But also that you have already experienced so much as a child, big competitions, all those impressions, feelings, living separated from others, so much goes through your mind that you cannot handle it. That's why it is all so unclear to me.

The third story is that of a quest, in which life revolves not around recovery but around the patients' search for acceptance of and living with the illness (Widdershoven, 2000), such as the story of the former rower who had to start a true search after she terminated her career and is still "working towards her goal of eating what she feels like". Patients telling recovery or quest stories seemed more certain about possible causes and influences of their disorder. Although our theoretical framework which distinguished between predisposing, precipitating, and perpetuating factors in daily life and sport seemed valid, it turned out quite a challenge for some participants to discriminate between the different influences.

For reasons of reflexivity and self-knowledge, only atletes who had received treatment for their eating disorder were included in the present study. Unintendedly, the therapy could have influenced their narratives because athletes have become more acquainted with theories about disordered eating and will be affected by their therapists' interventions. Perhaps their eating histories, therefore, fit within culturally and scientifically constructed opinions, for example, about the relationship of eating disorders with perfectionism. Another possible interfering factor was the participants' initial reservedness to self-disclosure because they did not want to be remembered of their past, did not have all the answers yet, or because it felt difficult to accuse their coach or mother. Strength of the current study in this respect was the fact that the interviewer was the athletes' former therapist, and it was thought that participants would be more likely to provide open and

accurate answers to someone they have worked with so closely, rather than an "outside" researcher. Moreover, we believe that the possible effect of conducting one single interview, which from an ethnographic perspective might be taken as a limitation, was, therefore, largely neutralized. Yet, this familarity could also bring about certain disadvantages, such as social desirability or the participants' inclination to be consistent with what was told during treatment. Prior knowledge of the interviewer could also lead to insufficient questioning (because you think you know what is meant because it was discussed in therapy) or to raising certain questions as related issues were previously discussed. To minimalise possible interference, these aspects were addressed in the preparation of the actual interview and the participants' instructions.

A limitation of the present study was that the sample consisted of six athletes that did not make up a homogeneous sample but rather included a variety of sport types and eating disorders. Previous research showed that specific risk correlates exist for anorexia and for boulimia as well as more general eating disorder risk factors (Jacobi et al., 2004). Future studies should therefore try to include larger and more homogeneous samples to enhance the transferability of the results.

Concerning practical implications for prevention and treatment, several issues arise from this qualitative study. First, given that in some athletes' eating disorder weight-related coach pressure seems to play a role, it is important to recognize the power coaches have over athletes. They should be aware of their influence and the possible destructive impact of their comments and behaviors. The formation of a healthy and stable identity seems important in disordered eating prevention. Adopting a positive and democratic coach style in which athletes are involved in decision making would support the shaping of conscious and resilient athletes (Warriner & Lavallee, 2008). A more positive body image would also be stimulated by more realistic body evaluations and refraining from upward body comparisons and performance pressure, for which creating a mastery motivational climate could be an appropriate alternative (De Bruin, Bakker et al., 2009; Duda & Nicholls, 1992). Furthermore, coaches should be stimulated to take their responsibility in identifying athletes with an eating disorder and be taught how to discuss and talk to athletes on these topics (Jones et al., 2005; Sherman, Thompson, DeHass, & Wilfert, 2005).

Second, more positive involvement by other staff members beside the coach could empower coaches to work towards a healthier elite sports climate. The present findings showed that the influence of other staff members was mostly absent in the athletes' stories. The athletes also mentioned that they were often too afraid or ashamed to share their problem; they succesfully hid it, or, if they tried to come foward, their signals were not picked up properly. Sport psychologists could be asked to turn to more proactive questioning on possible side effects of elite sport participation. They could step forward as the confident person that so many athletes seem to need.

Third, a few clues were found for the rightness of international sports federations to change competition rules, as was done in wrestling and ski jumping, for example, where weigh-ins are scheduled more closely to the actual wrestling competition and low body mass index scores have to be compensated by shorter skis in order to inhibit extreme weight loss. Other organizations advocated an entire abandonment of public weigh-ins. The athletes' stories made clear that legislation should perhaps also be extended to the issue of revealing sports clothing, which, according to some, is a necessity for women sports to get more viewing ratings and funding, but seems to influence women athletes' disordered eating very negatively.

Fourth, the athletes brought up predisposing personality characteristics and explicitly mentioned that it was their subsequent vulnerability or own choice that made them start dieting. After the interviews, however, they also admitted that they were reluctant to speak ill of their mother, teacher, or coach, which raises the question if their insights were affected by the internalizing of their problems. Self-criticism is after all a key predictor of an eating disorder (Fennig et al., 2008). Anyway, sport psychologists could alleviate negative personality influences through applying mental skills training. Negative perfectionism, self-handicapping, and wrong attributions could be addressed with goal setting, debriefing and cognitive training techniques, among others. In addition, athletes could be taught a more healthy stress-coping style that helps them in dealing with competitive anxiety more effectively. Needless to say that these interventions would be beneficial to all athletes, not just the ones who are vulnerable to eating disorders.

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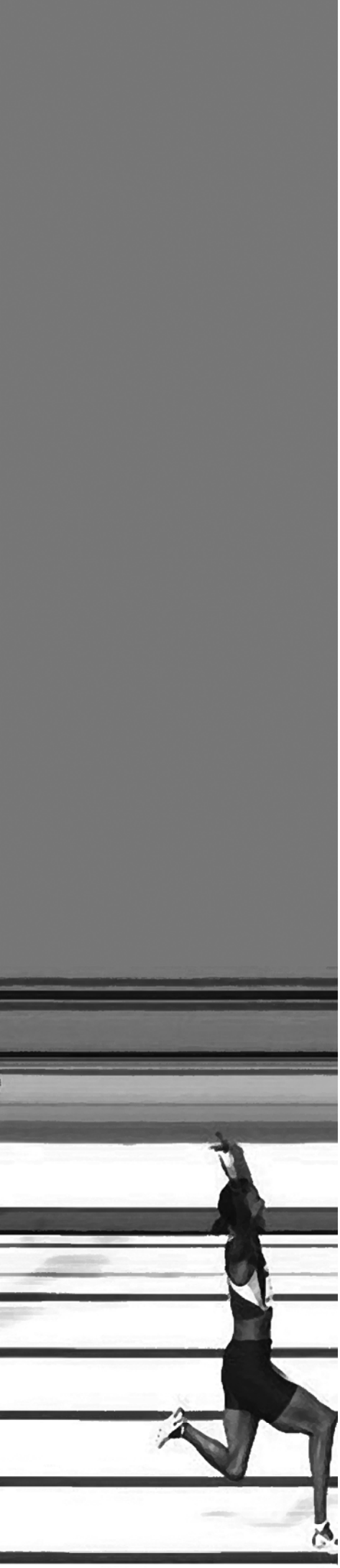

Chapter 6

Achievement goal theory and disordered eating: Relationships of disordered eating with goal orientations and motivational climate in female gymnasts and dancers

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Abstract

Objectives: To examine the relationships between disordered eating in female gymnasts and dancers and their perspective towards achievement in sport and dance, respectively. With an emphasis on outperforming others (ego involvement), more disordered eating was expected than when personal progress (task involvement) was emphasized. 94 aesthetic performers from gymnastics (n=59) and dance (n=35) filled in questionnaires measuring ego and task involvement (individual orientation and motivational climate), dieting, self-esteem, perfectionism and weight-related peer and coach pressure.

Results: Partial correlations indicated that a stronger ego orientation was related to more dieting, greater perfectionism, more weight-related peer pressure, and lower self-esteem. Similar relationships were found for performance climate. Mastery climate on the other hand was negatively related to dieting, and coach and peer pressure, suggesting that when performers perceived the motivational climate as mastery, less frequent dieting was reported and less weight-related coach and peer pressure was perceived. No relationships were found between task orientation and disordered eating. Most importantly, regression analysis showed that after controlling for BMI, both ego orientation and mastery climate made a unique significant contribution to explaining dieting variance.

Conclusions: Achievement goal theory is an important framework for explaining disordered eating in female aesthetic performers. Both ego orientation and mastery climate play a role in dieting of gymnasts and dancers. Aesthetic performers who are strongly ego-oriented tend to display more disordered eating correlates. Furthermore, it seems that to protect against disordered eating, coaches and teachers should create a mastery climate and target self-improvement and self-referenced comparisons over interpersonal competitiveness.

Introduction

Female gymnasts and dancers are known as high-risk groups for the development of disordered eating patterns (Anshel, 2004; Hausenblas & Carron, 1999; Ringham et al., 2006; Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen & Torstveit, 2004). Elevated rates of disordered eating are often found in these "aesthetic performers" who have in common that they participate in a weight-related subculture, where a certain (low) weight and shape is often overemphasised (Jacobi, Hayward, Zwaan, Kraemer, & Agras, 2004). Disordered eating is described by the American College of Sports Medicine as: "A wide spectrum of harmful and often ineffective eating behaviors used in attempts to lose weight or achieve a lean appearance. The spectrum of behaviors ranges in severity from restricting food intake to bingeing and purging…" (Otis, Drinkwater, Johnson, Loucks, & Wilmore, 1997, p. i; Nattiv et al., 2007). Disordered eating typically involves a wilful attempt to create a negative energy balance. In sports and dance, part of this attempt is based on the premise that a thinner/leaner body and appearance can enhance performance or render better judgments and scores (Sherman & Thompson, 2006a). Thus, disordered eating is at least partly related to the drive to perform well (De Bruin, Oudejans, & Bakker, 2007; Sangenis et al., 2005).

Although it may seem obvious what it means to perform well in sports, it turns out that the athletes' definitions of success can be very different (Roberts, 2001; 2006). Some see successful performance mainly in terms of winning and outperforming other competitors while for others success depends on their individual achievement such as setting a personal record (irrespective of the performance of other competitors). These different perspectives on success are identified in achievement goal theory (Nicholls, 1984; 1989), which has been a central framework within sport psychology over the past 20 years (Roberts, 2006). Given the apparent link in sport and dance between disordered eating and the performers' motivation for achievement, it may be fruitful to investigate the possible role of achievement goals in disordered eating, as more insight into this role can make prevention and counselling programs for athletes and dancers more effective.

Achievement goal theory (Nicholls, 1984; 1989), originally formulated for the educational context, was successfully adopted as a major theoretical framework in sport and exercise settings over the past decades (Duda & Nicholls, 1992; Duda & Whitehead, 1998). An assumption of achievement goal theory is that in achievement settings a major motivational drive is to demonstrate competence or ability. However, individuals differ in their perception of when this goal is achieved (Chi, 2004; Roberts, 2001). More specifically, achievement goal theory distinguishes between two different perspectives, also referred to as goal orientations, namely ego orientation and task orientation. With an ego orientation, the goal of action is to demonstrate ability relative to the ability of others. In this case, the definition of subjective success is other-referenced, that is, a highly ego-oriented individual feels competent when he or she has outperformed others. A task-

oriented individual on the other hand sets self-referenced goals emphasizing learning, self-improvement and mastery of a particular skill. In this case, the individual feels competent when he or she has made personal progress (Duda, 1993; Roberts, 2006). Goal orientations are generally considered to be orthogonal, which implies that combinations of ego and task orientations exist at the same time, each being high or low (Roberts, 2001).

In addition to these more dispositional goal orientations towards success, achievement goal theory also distinguishes amongst situational influences on the perception of success. The achievement environment of the individual, within achievement goal theory labelled as motivational climate, can also be more ego-oriented or more task-oriented. When the motivational climate is more ego-oriented, also referred to as a "performance climate"[4], coaches, training staff, parents and/or teammates place their emphasis upon social comparison and outcome, and encourage athletes to exhibit competitive behaviours and beliefs (Ames, 1992; Duda, 1993). A task-oriented climate or "mastery climate" promotes learning and personal development, allows making mistakes as an essential part of learning, and stimulates peer interaction and cooperation (Ames, 1992; Duda, 1993). Whether the climate is performance or mastery affects the degree to which someone exhibits an ego- or task-involved achievement pattern (Duda, 1993).

Ego involvement, whether due to individual orientation, the motivational climate or both, has been linked to several maladaptive behaviours (Duda, 1993; Roberts, 2001; 2006). Ego-involved athletes show, for example, less commitment to practice, they are less likely to maintain self-confidence, experience less enjoyment and satisfaction, and report more competitive anxiety when having low perceived ability (Chi, 2004; Roberts, 2001; Ryska, 2001; Van Yperen & Duda, 1999; Walling, Duda, & Chi, 1993). Moreover, ego involvement has induced both health-related and ethical concerns. For instance, ego-involved athletes seem to exhibit low levels of moral functioning (Kavussanu & Ntoumanis, 2003) as they believe that unfair play and potentially harmful tactics contribute highly to success (Duda, 1993; 2001). Preliminary evidence also showed relationships between ego orientation and unacceptable achievement strategies involving aggression (Roberts, 2001). The above findings suggest that athletes high in ego orientation may adopt the view that "winning at all costs" is justified (Roberts, 2001). If this is true, one would expect that ego involvement is also more closely related to other harmful behaviours such as using drugs, and several weight control and dieting behaviours (Chi, 2004; Duda, 2001). The results of Duda and her colleagues in several not fully published papers provided a first indication that a performance motivational climate could have a negative influence on female gymnasts' body image, weight concerns and other

[4] Different terms are used in the literature. For instance, an ego-oriented motivational climate is also referred to as competitive climate or performance climate. A task-oriented climate is also known as a learning climate or mastery climate (Roberts, 2001).

disordered eating correlates such as low self esteem (Duda, 1999; 2001; Duda & Kim, 1997; Duda & Benardot, 1997 in Hausenblas & Carron, 2001).

Task involvement, on the other hand, establishes the basis for maximal motivation and adaptive behaviours (Duda, 1993; Roberts, 2001; 2006). Positive relationships have been found for task orientation with intrinsic motivation, perseverance and satisfaction, and a negative relationship has been found with certain task-avoidant behaviours (Roberts, 2001). Task orientation was also found to correspond with high levels of moral functioning (Kavussanu & Ntoumanis, 2003; Sage, Kavussanu, & Duda, 2006). As for mastery climate, negative relationships were found with phenomena such as self-handicapping (Kuczka & Treasure, 2005). In addition, some support was found for a task-involving climate positively predicting respect for the sports game (Gano-Overway, Guivernau, Magyar, Waldron, & Ewing, 2005). Moreover, Duda and her colleagues also reported that a mastery climate seemed to have a protective influence on physical and psychological correlates of disordered eating in female gymnasts (Duda, 1999; Duda & Bernadot in Hausenblas & Carron, 2001; Duda & Kim, 1997).

The present study focused on the relationships between goal orientations and perceived motivational climate and several correlates of disordered eating in female gymnasts and dancers. More specifically, dieting frequency, use of weight control methods, self-esteem, perfectionism and weight-related environmental pressures by coaches/teachers and weight-related peer pressure were chosen as disordered eating correlates. The association between dieting and eating disorders is probably one of the most quoted in theories on how eating disorders are developed, indicating that frequent dieting and using weight control methods have often been considered to be important precursors of eating disorders (Jacobi et al., 2004; Thompson & Sherman, 1999). According to the "continuum hypothesis", dieting may lead to disordered eating which, in turn, may lead to a sub clinical or clinical eating disorder (Fries, 1974; Beals & Manore, 1984). Other well-known risk correlates of disordered eating are low self-esteem and high perfectionism, in the general population as well as in athletes and dancers[5] (Anshel, 2004; Engel et al., 2003; Jacobi et al., 2004; Lindeman, 1994; Nordin, Harris, & Cumming, 2003). In addition, weight-related environmental pressures by coaches and peers were also found to be important contributors to disordered eating in both athletes and dancers (Berry & Howe, 2000; De Bruin et al., 2007; Engel et al., 2003; Hausenblas & Carron, 2001; Thomas, Keel, & Heatherton, 2005).

We hypothesized that high ego involvement in female aesthetic performers would be positively related to disordered eating, meaning that the higher their ego involvement (i.e., ego orientation, performance climate) the more disordered eating they would display.

[5] The present study was part of a larger one. Relationships between gymnasts' and non-gymnasts' dieting and risk correlate body image have been reported elsewhere (De Bruin et al., 2007).

More specifically, we expected positive relationships with dieting, weight control, perfectionism, weight-related coach and peer pressure, along with a negative relationship with self-esteem. Secondly, negative relationships between task involvement and disordered eating were expected; that is, high task involvement was expected to correlate with less disordered eating. We hypothesized that there would be negative relationships with dieting, weight control, perfectionism, weight-related coach and peer pressure, and a positive relationship with self-esteem.

Methods

Participants and procedure

In collaboration with the Royal Dutch Gymnastics Union (KNGU), all 15 coaches working with highly competitive female gymnasts at the National Olympic Centres or in national gymnastics associations were approached and 14 coaches agreed to cooperate. In addition, we contacted the coordinator of a high level Dance Academy who provided access to all female dance students. Participants were asked by their coach or teacher to participate in a study on the effect of physical activity on body image to avoid selective response as much as possible. They were told that participation was voluntary and strictly anonymous; all 94 gymnasts and dancers agreed to participate. The girls who were under 18 were requested to hand in a written parental permission allowing participation. In addition, a written informed consent was obtained from the participants. The data collection was scheduled around training or classes and occurred in groups in the presence of the researcher (first author); 76 of the 94 questionnaires (81%) could be collected this way. The remaining 18 participants, for whom the administration could not be arranged in group sessions, received the questionnaire by mail (n = 10), in person from the researcher (n = 1), or from the coach (n = 7) after he/she had agreed to stick to the ethical principals and research instructions of the present study[6]. It took the participants approximately 30 to 40 minutes to fill in the questionnaire. The research design was reviewed and approved by the Ethics Committee of the Faculty of Human Movement Sciences at the VU University Amsterdam.

In this study, only high level aesthetic performers who did not participate in additional competitive sport activities were included to rule out the possible influence of other motivational climates, as well as other coaches and peers. The present sample (n = 94) consisted of 59 female artistic gymnasts and 35 female modern dancers. The mean age of

[6] Just before the actual data collection, the voluntary and anonymous character of the study was repeated, both orally and in writing, and it was explained to the participants that they could quit at any time without any consequences. Participants were asked to complete the entire questionnaire and to answer candidly and privately. They were informed that the added prepaid envelope could be used for returning the test and informed consent form(s), by handing it over to the researcher or by sending it back by mail. In addition, it was explained that the questionnaire would be separated from the consent form(s) on arrival to maintain the participants' anonymity.

these aesthetic performers was 15.1 years (*SD* = 1.4) and their body mass index (BMI) varied between 14.61 and 23.67 with an average of 18.52 (*SD* = 1.86). No significant differences were found between gymnasts and dancers on age or BMI (see Table 6.1). On average, the participants spent 16.7 hours (*SD* = 6.7) on gymnastics or dance per week. More specifically, the gymnasts spent 18.1 hours (*SD* = 7.8) on training and competition, which was significantly more than the 14.4 hours (*SD* = 3.28) that the dancers spent weekly on dance classes and performances, $F(1,92) = 7.196$, $p < .05$.

Measures

The following questionnaires were included in this study:

Task and Ego Orientation in Sport Questionnaire

Individual differences in the emphasis placed on task and ego goal perspectives in sport were measured with the Task and Ego Orientation in Sport Questionnaire (TEOSQ) (Duda & Nicholls, 1992). The TEOSQ is the only questionnaire measuring ego and task orientation that was already translated into Dutch and validated (Van Yperen & Duda, 1999). The questionnaire measures how individuals typically define success in sport with respect to normative (six items on ego orientation) and self-referenced criteria (seven items on task orientation). For 11 out of 13 items the exact same translations as in the original Dutch translation were used. For one item, the word 'teammates' was replaced by 'others', and for another, we chose to translate the original item "I score the most points" by Duda (1992) instead of the reworded item "I contribute most to the victory" of Van Yperen and Duda (1999) to be pertinent to gymnasts and dancers. In the present study, the TEOSQ begins with the words "I feel most successful in gymnastics/dance when." Examples of task-oriented items of the TEOSQ included "I work really hard" and "I do my very best." The ego-oriented scale for example contains such items as "The others can't do as well as me" and "I am the best". Responses on each item were recorded on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Mean scale scores were calculated for each of the two presumed orthogonal subscales and ranged from 1 (*low*) to 5 (*high*). The internal consistency of the TEOSQ is generally strong (Duda & Whitehead, 1998); in this study the ego scale had $\alpha = .91$ and the task scale had $\alpha = .83$.

Perceived Motivational Climate in Sport Questionnaire

To measure athletes' perceptions of the degree to which their coaches created mastery and/or performance climates the Perceived Motivational Climate in Sport Questionnaire (PMCSQ) was used (Seifriz, Duda, & Chi, 1992). Acceptable construct and predictive validity has been reported for the PMCSQ (Walling et al., 1993). In the present study we used the Dutch translation of the 40 PMCSQ items (Vergers, 2001). The original translation from English to Dutch was done by three native Dutch speakers with expertise from the field of sport psychology and goal achievement theory. After this original translation, several unpublished studies were executed in various samples to establish

validity and reliability of the Dutch PCMSQ, and the items were adjusted until a satisfactory version was developed (Vergers, 2001). For the present study, adjustments were made to the wording of the 20 mastery climate items and 20 performance climate items in cooperation with a sport psychologist, gymnastic trainer and dance teacher so that the measures showed face validity for gymnastics and dance. When filling out the PMCSQ gymnasts responded to the stem "in this training gym…" while dancers responded to "in this dance class…" by rating each item on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The mastery climate scale included items such as "gymnasts/dancers try to learn new skills" and "trying hard is rewarded." Examples of performance climate items for dancers were "only the best dancers get noticed" and "dancers are punished for mistakes". Reliability analyses in previous research showed good internal consistency for both scales (Seifriz et al., 1992; Walling et al., 1993). For the Dutch version, Cronbach's alphas were found ranging from .69 to .88 (Vergers, 2001). Internal consistency in the present study was $\alpha = .80$ for the mastery climate scale and $\alpha = .83$ for the performance climate scale. Mean scale scores were calculated for each of the two subscales ranging from 1 (*low*) to 5 (*high*).

Dieting behaviours and weight characteristics

Dieting and weight control frequency, from now on abbreviated with dieting frequency, was measured on a 9-point-scale running from 1 (*never*) to 9 (*always*) (Woertman, 1994) with the following item: "Are you trying to lose weight?" (Wardle, Haase, & Steptoe, 2006; Woertman, 1994). Based on Petrie and Stoever (1993), five items of the Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991) were selected to measure the use of the following weight control practices: exercising in order to burn calories, fasting/strict diets, self-induced vomiting, use of diuretics/diet pills, and use of laxatives/suppositories. Participants were asked if they had ever used the particular weight control method, and if so, how often in the last three months. Good reliability and adequate concurrent validity has been reported for the BULIT-R among adolescent girls (Vincent, McCabe, & Ricciardelli, 1999). Comparable to Engel et al. (2003) who investigated disordered eating in collegiate athletes, we constructed a pathogenic weight control index score. This score was computed by adding up the number of weight control methods used in the last three months, varying from zero to five (De Bruin et al., 2007). The internal consistency of the weight control index in the present study was $\alpha = .65$. Participants were also asked to report their current height (in cm) and weight (in kg). With the self-reported height and weight figures, BMI (weight in kg / height in m^2) was calculated.

Rosenberg Self-Esteem Scale

Self-esteem was measured with the Dutch translation by Van Son (Woertman, 1994) of the Rosenberg Self-Esteem Scale (RSES: Rosenberg, 1989). Ten items measured self-acceptance and self-worth, and are rated on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Studies have demonstrated both a one-dimensional and a

two-factor (self-confidence and self-deprecation) scale structure (Rosenberg, 1989). Scoring procedures are generally executed by adding up all ten items. This was followed in the present study with scores ranging from 10 to 50. A higher score means higher self-esteem. The scale generally has high reliability: test-retest correlations are in the range of .82 to .88, and internal consistency for various samples is ranging from .77 to .88 (Blascovich & Tomaka, 1993). In the present study $\alpha = .89$.

Eating Disorder Inventory-2 (EDI-2) - Subscale Perfectionism

The official Dutch translation by Van Strien of the Perfectionism Subscale of the Eating Disorder Inventory-2 (EDI-2; Garner, 1991) was used to measure perfectionism (Schoemaker, van Strien, & van der Staak, 1994) as one of our disordered eating correlates. The items were rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) to be in line with the other 5-point Likert-scale items. A higher score indicates higher perfectionism. The questionnaire has been used in various populations and has good internal consistency and test-retest reliability (Castro-Fornieles et al., 2007). In the present study, for the perfectionism subscale we found $\alpha = .79$.

Weight-related coach and peer pressure

Based on studies of Berry and Howe (2000) and Hausenblas and Carron (2001), the scale "weight-related peer pressure" was constructed. "Peer pressure" consisted of the following five items: "girls talk regularly about dieting," "girls judge each other on appearance," "girls take over each others bad eating habits," "girls are pestered about being unattractive or being fat," "team/classmates use unhealthy weight control methods". In addition to the scale peer pressure, the scale "weight-related coach pressure" was used (De Bruin et al., 2007). The coach pressure scale consists of four items, for example "coaches are urging girls to diet", and "coaches attribute failure to girls' weight". The 5-point Likert-items were constructed around the stem "in this training gym" and were running from 1 (*totally disagree*) to 5 (*totally agree*). For dancers, the stem was changed into "in this dance class…" and the word coach was replaced with "teacher". A higher score indicates more perceived weight-related pressure. In previous research in elite and non-elite female gymnasts, internal consistency of the scale weight-related coach pressure was .79 (De Bruin et al., 2007). In this study, for both scales "coach pressure" and "peer pressure" we found an internal consistency of $\alpha = .78$. A very strong relationship exists between coach and peer pressure, $r = .79$, $p < .01$.

Data analysis

Exploring the data and assessing normality revealed that the assumption of normality was violated for the variables dieting frequency, weight control, peer pressure, and ego orientation. Whereas dieting frequency, weight control and peer pressure were positively skewed because most of the respondents reported low scores on the scale, ego orientation was negatively skewed with most scores at the high end. Subsequently, both parametric and non-parametric statistical analyses were performed to assure that the violation of

normality did not lead to different results. According to Stevens (1996) with large enough samples (e.g., 30+) the violation of normality should not cause any major problems (Pallant, 2005). Indeed, the parametric and non-parametric analyses showed similar significant results and correlational strengths in the present study. Subsequently, we decided it was sound to present the results of parametric tests on the original untransformed variables for reasons of clarity, except for the regression analysis for which we used and presented transformed variables (see below).

To compare the female gymnasts and dancers on several background characteristics as well as on the achievement motivation variables and disordered eating correlates, several Mann-Whitney U-tests and ANOVAs were performed. ANOVA results with Bonferroni adjustments are reported.

Correlation analysis was used to determine the relationships of the achievement variables and the selected disordered eating correlates. As the development of disordered eating seems to be related to athletes' actual body composition (Berry & Howe, 2000; De Bruin et al., 2007), it is important to control for body characteristics. In addition to Pearson's correlations and Spearman's rank order correlations, we therefore computed partial correlations with BMI as a covariate. In determining the strength of the relationships, we followed Cohen (1988), who referred to medium strength when $r > .29$ and large strength when $r > .49$.

To explain which variables contributed most to the variance of dieting frequency, a hierarchical multiple regression analysis was executed. Tabachnick and Fidell (2007) give a formula for calculating sample size requirements taking into account the number of independent variables, $N > 50 + 8*m$ (where m = number of independent variables). We statistically controlled for body mass index in step 1 whereas the four achievement motivation variables were included in step 2, leading to a required sample size of 90 cases. As the assumption of normality was violated for dieting frequency and ego orientation, the appropriate modification of these variables was executed according to the suggested transformation formulas by Tabachnick and Fidell (2007); more specifically, the "logarithm" transformation was used for dieting frequency and the "reflect and square root" transformation for ego orientation, both resulting in less skewed distributions. Before conducting the regression, other assumptions such as multicollinearity, were also examined; no such problems with the data were found. Unlike the other statistical analyses, the regression analysis of the original untransformed variables differed from the analyses of the transformed variables. Therefore, the latter are reported (see Table 6.3).

Results

The average scores on the achievement variables and disordered eating of the entire sample of aesthetic performers, as well as of the gymnasts and dancers separately are

presented in Table 6.1. Regarding the disordered eating correlates, no significant differences were found on dieting frequency, weight control, and coach and peer pressure, which suggests that female gymnasts and dancers exhibited similar dieting behaviours and experienced equal weight-related pressures from peers and their coaches or teachers. However, significant differences were found for self-esteem, $F(1,92) = 11.01$, $p < .05$, and perfectionism, $F(1,89) = 8.86$, $p < .05$. Dancers ($M = 33.66$, $SD = 8.17$) showed lower self-esteem than gymnasts ($M = 38.46$, $SD = 5.81$) and reported greater perfectionism (dancers: $M = 16.31$, $SD = 5.14$; gymnasts: $M = 13.21$, $SD = 4.64$).

Table 6.1 Average scores on background, achievement motivation and disordered eating variables (Standard Deviation)

	Elite (n=17)	Nonelite (n=51)	Controls (n=85)
Age	14.88 (1.61)	15.46 (.82)	15.10 (1.39)
BMI	18.79 (1.85)	18.07 (1.82)	18.52 (1.86)
Dieting frequency	3.47 (2.68)	3.26 (2.45)	3.39 (2.59)
Weight control index	.80 (1.14)	.83 (1.15)	.81 (1.14)
Self-esteem	38.46 (5.81)	33.66 (8.17)*	36.67 (7.14)
Perfectionism	13.21 (4.64)	16.31 (5.14)*	14.41 (5.04)
Peer Pressure	9.45 (3.58)	10.47 (3.8)	9.83 (3.68)
Coach/Teacher Pressure	9.26 (3.54)	7.79 (3.18)	9.72 (3.64)
Ego orientation	3.49 (1.04) [a]	3.65 (.66) [a]	3.55 (.92) [a]
Task orientation	4.03 (.59) [a]	4.13 (.61) [a]	4.07 (.60) [a]
Performance climate**	2.53 (.53)	2.80 (.57)*	2.63 (.56)

Note. [a] *The TEOSQ does not have official norm scores. For comparison, consider the TEOSQ scores (mean, SD) of other female samples, such as soccer players (n = 212, ego = 2.50 (.96), task = 4.12 (.64); Stephens & Bredemeier, 1996); and middle-distance runners (n = 80, ego 3.0 (1.1), task = 4.4 (.5); Hall, Kerr, Kozub, & Finnie, 2007). The present sample seems comparable to these groups on task orientation, but higher on ego orientation.*

** Differences between dancers and gymnasts were tested at the significance level of $p < .05$.*

*** Bonferroni correction to $p < .00833$, $p < .0125$ resulted in significant differences in self-esteem ($p = .001$) and perfectionism ($p = .004$), but not in performance climate ($p = .025$).*

Regarding the achievement variables, we found that the average scores for task orientation were higher than for ego orientation, indicating that the aesthetic performers perceived themselves as more task-oriented than ego-oriented. In addition, the motivational climate is also perceived more mastery-oriented than performance-oriented. In this respect, dancers scored higher on performance climate than gymnasts, $F(1,84) = 5.24$, $p < .05$, but when a Bonferonni adjustment was applied ($\alpha = .0125$), this result was not considered significant ($p = .025$). Furthermore, no significant differences were found between

gymnasts and dancers, neither on mastery climate and ego and task orientation (see Table 6.1), nor on the high-low classifications of ego and task orientations combined.[7]

Pearson's correlations between the achievement variables were computed, resulting in moderate correlations in the entire sample between ego orientation and performance climate, $r = .46$, $p < .01$, between task orientation and mastery climate, $r = .35$, $p < .01$, and between ego and task orientation, $r = .36$, $p < .01$. The relationship between performance and mastery climate was weak and negative, $r = -.21$, p = ns. In addition, partial correlations with covariate BMI were computed to explore the relationships between the achievement variables and disordered eating correlates.[8] As can be seen from Table 6.2, ego orientation was significantly and positively correlated with dieting frequency, weight control, perfectionism, and peer pressure. These relationships were in the expected directions and mainly of medium strength. For task orientation, only non-significant relationships were found. With respect to performance climate, significant relationships were found with all disordered eating variables, again in the expected directions. More specifically, strong relationships were found with coach pressure and peer pressure, in addition to moderate relationships with perfectionism and self-esteem, and weak relationships with dieting and weight control. For mastery climate, significant and negative relationships were found with dieting frequency, coach pressure and peer pressure, as we expected. In other words, when the motivational climate was perceived as mastery-oriented, less frequent dieting was reported and less weight-related peer and coach pressure was perceived. A positive relationship was found with self-esteem, indicating that performers in a mastery climate report higher levels of self-esteem.

The results of the hierarchical regression analysis of achievement motivation as a predictor of dieting frequency are presented in Table 6.3. Together, the four achievement motivation variables explained an additional 12% of the variance in dieting frequency, when the effect of body mass index was statistically controlled for, $F(5,75) = 6.48$, $p < .001$. Three variables made a statistically significant contribution, that is BMI (beta = .39), ego orientation (beta = -.24) and mastery climate (beta = -.24), uniquely explaining 15%, 4% and 5% of dieting frequency, respectively.

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[7] Participants' ego and task orientation were classified as high/low ($M \pm ½\ SD$). For example, 27 participants were categorized as highly ego oriented, 30 as low ego oriented, while the remaining 37 scored in between, $M - ½\ SD < x < M + ½\ SD$. No significant differences were found between gymnasts and dancers on these classifications, χ^2s(1, N = 57, 59) < .31, ps = ns. Only three participants were classified as high ego/low task, making it impossible to pursue comparisons of high ego/high task and high ego/low task on disordered eating to explore the possible protective influence of a high task orientation. When comparing high versus low ego and task orientations separately, significant differences were found for ego orientation, Fs(1,52-55) > 8.16, ps < .01, showing more dieting and weight control, greater perfectionism and more peer pressure when highly ego-oriented, but not for task orientation, Fs(1,55-57) < 2.67, ps = ns.

[8] In comparing the Pearson's and partial correlations, only small differences were found in the correlation strengths.

Table 6.2 Partial correlations between achievement variables and disordered eating

Control variables		Dieting	Weight control	Self-esteem	Perfectionism	Weight-related Coach Pressure	Weight-related Peer Pressure
BMI	Ego orientation	.33*	.28*	-.11	.42**	.21	.33*
	Task orientation	.18	.17	-.06	.22	.10	.12
	Performance climate	.25*	.26*	-.37*	.37*	.54**	.63**
	Mastery climate	-.24*	-.13	.29*	-.23	-.26*	-.44**

*Note. * p < .05; ** p < .01.*

Table 6.3 Summary of hierarchical regression analysis for predicting dieting frequency

	B	*SE B*	β	*Sig.*	R^2	ΔR^2	SP^2 [a]
Step 1				.00*	.19	.19	
Body Mass Index	.08	.71	.39	.00*			.15
Step 2				.02*	.30	.12	
Ego orientation	-.30	.14	-.24	.04*			.04
Task orientation	.05	.07	.08	.47			.00
Performance climate	.01	.07	.02	.89			.00
Mastery climate	-.23	.10	-.24	.03 *			.05

Note. This regression analysis is conducted with transformed variables for dieting frequency and ego orientation. Therefore, the interpretation of ego orientation differs from the original scale, with lower scores indicating higher ego orientation and higher scores implying lower ego orientation. Subsequently, the minus sign for ego orientation indicates a relationship with dieting in the opposite direction of that of dieting with mastery climate. Analysis of the untransformed variables also led to significant contributions of BMI (beta = .38, SP2 = .14) and ego orientation (beta = .25 SP2 = .05) (ps < .05), in addition to a trend for mastery climate (beta = -.20, SP2 = .03 (p = .064), F(5,75) = 6.39, p < .001.

[a] *SP2= squared semi-partial or Part correlation coefficients.*

** p < .05.*

Discussion

As disordered eating among female athletes and dancers seems at least partly motivated by their drive for performance enhancement, we studied the links between disordered eating and achievement goals, a performance-related key concept. The present study showed that both ego orientation and performance climate were related to more frequent dieting, using more pathogenic weight control methods, greater perfectionism and perceiving more weight-related peer pressure. For performance climate, additional relationships were found with more coach pressure and lower self-esteem. Yet, it turned out that ego orientation and not performance climate appeared to significantly contribute to explaining the variance of dieting frequency. The present study, therefore, confirms that having a high ego orientation means that a female aesthetic performer is significantly more likely to report indices of disordered eating.

These results establish the suggestions and findings about relationships between ego orientation, performance climate and eating disorders symptomatology by Duda and colleagues (Chi, 2004; Duda, 1999; 2001; Duda & Kim, 1997; Roberts, 2001). The present study also gives empirical support to Powers' statement (1999) that performance-centred coaching has a negative implication for eating disorders.

According to Roberts (2001), the detrimental effects of ego involvement are related to the fact that ego-oriented athletes adopt the "win at all costs" philosophy and embrace the idea that the end of winning justifies all means. Strongly ego-oriented athletes not only believe that illegal advantage and harmful tactics contribute highly to success, but they also seem to act accordingly (Roberts, 2001). The present study adds disordered eating to these harmful behaviours.

The links between ego involvement and disordered eating can also be related to competitiveness and other-referenced comparisons that are inherent to ego involvement. Because highly ego-involved performers want to outperform others, they repeatedly compare themselves with opponents and team-mates, as a result of which comparing and competing in terms of thinness is more likely to occur as well. "Competitive thinness" is an important risk factor for the development of disordered eating in athletes (Sangenis et al., 2005). If an athlete notices that someone who has defeated her looks thinner or leaner, she can become motivated to start dieting for performance enhancement or to copy pathogenic weight control behaviour even when that same person is exhibiting disordered eating patterns. Some athletes have suggested that their difficulties with eating occurred when coaches compared their bodies and performances to that of their team-mates (Sherman & Thompson, 2006b). It is likely that such phenomena are more common in ego-oriented gymnasts and dancers and when performing in performance-oriented motivational climates.

In addition, the present study also shows that a mastery climate is negatively related to disordered eating. We found that mastery climate uniquely explained some of the variance of dieting frequency. Furthermore, partial correlations indicated that gymnasts and dancers reported less frequent dieting, they perceived less weight-related peer and coach pressure and experienced more self-esteem when they perceived the motivational climate as mastery. All relationships between mastery climate and the disordered eating correlates were in the expected 'protective' directions. In sum, our results confirm the statements and results of Duda that a mastery climate seemed to have a protective influence on disordered eating in female gymnasts (Duda, 1999; Duda & Kim, 1997). Our results also confirm Powers' suggestion (1999) that person-centred (read: mastery) coaching could act as a protective factor for eating disorders.

While our expectations about negative relationships between task involvement and disordered eating could be confirmed for mastery climate, only non-significant correlations were found between task orientation and the disordered eating correlates. These results seem to be in line with the fact that no explicit suggestions about links between task orientation and disordered eating have been made before. In addition, it seems to fit with other studies that did not find a protective role of task orientation on other maladaptive behaviours either (e.g., Sage et al., 2006). In conclusion, having a high task orientation does not always seem to be protective in and of itself (see footnote 4).

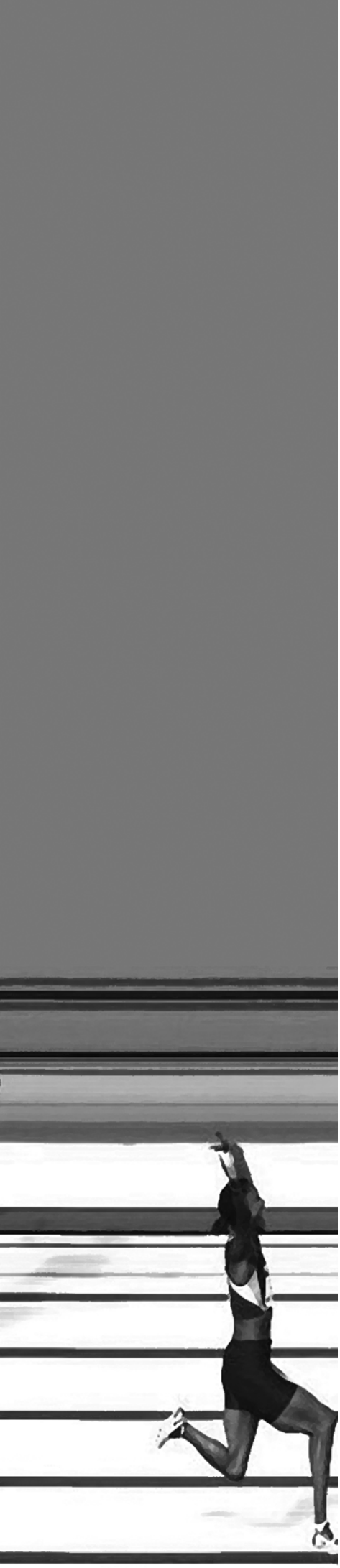
A limitation in the present study was that we used a relatively crude measure for pathogenic weight control with limited reliability (Nunnally, 1978). In future studies focusing exclusively on relationships between eating disorders or disordered eating with achievement motivation, full versions of general or sport-specific measures could be administered such as the Eating Disorder Inventory-2 (EDI-2; Garner, 1991) or the Female Athlete Screening Tool for disordered eating (FAST; McNulty, Adams, Anderson, & Affenito, 2001).

Another limitation was that we had to confine ourselves to self-reported height and weight because objective measurement of body composition was perceived as too threatening for some aesthetic performers. Self-report holds the risk of both under- or overestimation. Davis (1990) concluded that self-report is more accurate when the anonymity of the respondents is guaranteed, as we did in the present study. For eight gymnasts, we were able to check the congruence between the self-reported data and recent objective measurements and found a strong correlation of $r = .88$. This gave us some indication that the reliability of self-reported measures could be satisfactory, but at the same time this correlation may not be representative of what would be observed in the whole sample. Future studies should continue in making an effort to include objective measurements by the researchers or recent actual data provided by medical staff members.

Another constraint in the present study was the composition of our sample. As the number of high level competitive gymnasts in the Netherlands is limited, we also investigated a group of high level female dancers. Significant group differences were observed for self-esteem and perfectionism, indicating that dancers score higher on perfectionism and lower on self-esteem when compared with gymnasts. These results are in agreement with previous research among dancers (e.g., Anshel, 2004; Ringham et al., 2006), yet, as far as we know, the present study is unique in comparing dancers with a comparable group of female artistic gymnasts. Apart from that, since gymnasts and dancers did not differ on most of the included variables, we concluded that our sample of female aesthetic performers was quite homogeneous. Nevertheless, the observed relationships of this study should be replicated in future studies using larger samples of various athletes at risk for disordered eating.

In conclusion, aesthetic athletes' and performers' eating attitudes and dieting behaviours seem to be specifically connected to their drive for performance enhancement (De Bruin et al., 2007; Sangenis et al., 2005; Sherman & Thompson, 2006a). The present study shows that the performance-related achievement goal theory seems to be a useful framework in explaining disordered eating in female gymnasts and dancers. Regression analysis indicated that the four achievement goal variables significantly predicted dieting frequency. Together they explained an additional 12% of the overall variance, after controlling for BMI. It turned out that both ego orientation and mastery climate made a statistically significant unique contribution in the present study. Roberts (2001) stated that a high ego orientation is particularly detrimental if it is accompanied by a low task orientation. Future research should further investigate if this is also true for disordered eating (see also footnote 4). To gain a more complete understanding of the relationship between ego orientation and disordered eating, future studies could also include the more recent 2 by 2 framework which not only distinguishes between ego and task orientation but also between approach and avoidance achievement goals (Elliott & McGregor, 2001).

As a final remark, the present study provided some evidence that a mastery climate may exert a protective influence on disordered eating. We therefore recommend that coaches and teachers should create a mastery climate with its emphasis on personal development and interpersonal cooperation. Female aesthetic performers need to be discouraged from interpersonal comparisons and competing in terms of weight and thinness to prevent the development of disordered eating patterns. Naturally, coaches and teachers should refrain from putting weight-related pressure on their pupils. It has been advised that in order to maximize performance and well-being, a mastery environment rather than a performance climate should be fostered (Duda, 1993). That this also holds for the prevention of disordered eating seems evident from the present study.



Chapter 7

Epilogue

Synopsis of main findings

In the preceding chapters various results and insights were reported that aimed at broadening our understanding of eating problems in at-risk groups of women athletes. Central question throughout this thesis was: "Why do certain athletes have an increased risk for eating disorder symptomatology?" Underlying issue was whether their eating disorder symptoms would also have developed when they would not have had their athletic career? To answer the central question, several variables within the daily life and sport contexts were explored to gain insight into the heightened vulnerability of certain athletes to the development of eating disorders. In Chapter 2, dieting behaviors of the general Dutch female adolescent population were investigated, particularly of adolescent girls who participate in sport out of weight-related motives. In Chapter 3, this adolescent control group was compared to a sample of elite and non-elite gymnasts, while in the subsequent Chapters 4, 5, and 6, disordered eating correlates in various samples of high performance women athletes were studied. The core of this thesis consisted of investigating the role of the multidimensional body image in disordered eating in athletes, which was discussed in the Chapters 3, 4, and 5. If body image was measured as a stable and context independent concept (see Chapter 3), contrary to what is generally believed, its role seemed limited as gymnasts' dieting behaviors were much stronger related to sport-specific variables such as weight-related coach pressure and beliefs that "thin is going to win" than to body image. By taking a contextual approach and investigating daily life as well as athletic body images, it turned out to be the athletic body image, in particular body evaluations of thinness-fatness within the sport context that proved to be significant for the development of disordered eating in women athletes (see Chapters 4 and 5). Furthermore, the results in Chapter 5 indicated that, together with predisposing factors such as family influences and certain personality characteristics, sport-related variables in particular acted as precipitating or maintaining factors of the development of disordered eating. Important in the sport context were, for example, environmental pressures concerning performance and weight, inappropriate coaching, and the necessity of wearing revealing sports clothing. All affected the athletes' body-evaluations negatively and resulted in upward body comparisons with better-off peers in sport. In Chapter 6, evidence was found to substantiate previous suggestions concerning the role of achievement motivation to either increase (when ego-involved) or decrease (when task-involved) the athletes' susceptibility to disordered eating. In the remainder of this epilogue, I will first discuss the theoretical implications of the main results. Next, I will address some methodological considerations of this thesis and provide guidelines for future research. Finally, I will discuss practical implications of our findings for improving eating disorder-related prevention and treatment programs for athletes. Before doing so, I will attempt to elucidate the extent and seriousness of disordered eating in sport in the Netherlands.

Increased prevalence of disordered eating in Dutch women athletes

Previous studies reported an increased prevalence of clinical or sub-clinical eating disorders in various samples of elite female athletes coming from countries in and outside Europe (e.g., Sundgot-Borgen & Torstveit, 2004). As already discussed in the Introduction (Chapter 1), it is not unlikely that the prevalence of eating disorders is quite similar in the Dutch population. However, to my knowledge, studies focusing on prevalence of eating disorders among athletes in the Netherlands are not executed so far. Even though establishing eating disorder prevalence was not directly the focus of this thesis, no indications were found that the numbers of Dutch athletes with disordered eating are different from those reported in other studies. In Chapter 4, for example, approximately 25% of high performance women aesthetic athletes in the study were classified as suffering from disordered eating which is comparable to the established prevalence in similar samples in Norway (Sundgot-Borgen, 1993; Sundgot-Borgen & Torstveit, 2004). Furthermore, as can be taken from Chapter 3, the high disordered eating prevalence in elite sport was also demonstrated in the present thesis as about half of the elite gymnasts admitted having used one or more pathogenic weight loss methods such as strict fasting, self-induced vomiting, or using laxatives, diuretics, or diet pills. In comparison, a quarter of the non-elite gymnasts, and approximately one out of three adolescent girls of the control group admitted doing so. The present results made clear that the presence of eating disorder symptomatology in elite sport appears to be quite substantial in the Netherlands. The findings also pointed towards commonness of eating-related problems in the general Dutch female adolescent population, parallel to what is identified in American and Australian studies (e.g., Middleman, Vasquez, & Durant, 1998; Wardle, Haase, & Steptoe, 2006). The results of Chapter 2 showed that dieting behaviors and body image-related problems outside the exercise arena are widespread too, particularly in girls participating in sports with the specific purpose of losing weight. These problems warrant special attention and justify the focus of this thesis on these at-risk groups of women athletes.

Theoretical implications of this thesis' main results

With the central question of this thesis in mind, that is, why certain athletes seem more vulnerable to eating disorder development, the theoretical implications of the main results and their compatibility with several proposed explanations for athletes' disordered eating will be discussed here in more detail. First, the results in this thesis showed that to increase understanding of athletes' disordered eating it is useful to distinguish between body images in daily life and sport. The women athletes in this thesis were generally more positive about their body in daily life than about their body in sport. They explained that their body awareness in the sport arena was increased for a number of reasons which resulted in negative body evaluations. Foucault already stated that individuals are viewed and view themselves with reference to cultural ideals, and that "the gaze is alert everywhere" (Foucault, 1979, p. 195). According to the perception of the women athletes,

that gaze seemed more severe and demanding in sport where stricter body demands and leaner ideals are applied than in daily life.

Second, for most athletes, the athletic body evaluations were not just related to aesthetics and appearance but also to performance. Hence, the results in this thesis indicated that besides or even instead of thinking that 'thin is beautiful' athletes seemed to believe that "thin is going to win". While many athletes were convinced that weight, shape, and/or appearance are highly responsible for their success, others also attributed their failure to these body-related aspects. It was demonstrated that these beliefs appeared to be present all over in the sports culture and were not just internalized by high performance women athletes themselves, but also held by significant others in their environment such as trainers and coaches. Strong evidence was found in this thesis for the impact of weight-related coach pressure on disordered eating development in women athletes which is in agreement with other studies (e.g., Kerr, Berman, & De Souza, 2006; Sundgot-Borgen, 1994). The present thesis also showed that negative coach influence on athletes' disordered eating may come in many forms, varying from comments on the athletes' bodies, either unintentionally or deliberately, and the introduction of weigh-ins and body measurements, to inappropriate and sometimes even abusive coaching.

Third, women athletes with disordered eating were significantly more negative about several body aspects in both daily life and sport than women athletes without disordered eating, although they did not differ on actual weight characteristics. Surprisingly, they did not perceive significantly more weight-related pressure either, though (representations of) environmental perceptions are generally of great importance to body image and disordered eating. Consequently, it was proposed that their vulnerability to disordered eating might have been increased by certain personal factors which somehow made them more attentive or sensitive to the opinions of others and any weight-related pressure. In this thesis, evidence was found to substantiate the influence of such personal factors, such as predisposing family influences and personality characteristics (e.g., low self-esteem, perfectionism, ego-orientation), on disordered eating correlates in athletes. These results are in agreement with the studies of Byrne and McLean (2002), Duda (1999), Haase, Prapavessis, and Glynn Owens (2002), Sundgot-Borgen (1994), and Williamson et al. (1995), among many others, all claiming that various personal factors appear to exert influence on athletes' disordered eating. However, it still needs to be determined why certain factors (e.g., ego orientation) appear to be harmful for the development of disordered eating and how they might be interrelated (e.g., with perfectionism).

In sum, these findings support the intra-individual explanation for athletes' eating disorders expressing that certain personality variables may have enabled the athletes to succeed in their sport but also placed them more at risk for eating disorders (Byrne & McLean, 2002; Sundgot-Borgen, 1994).

Our findings are also in line with the sport-environmental explanation for disordered eating in athletes. This explanation states that task and socially related pressures in sport, associated with competitive demands and beliefs that a thin body will improve performance, push athletes to turn to unhealthy weight control and subsequent disordered eating (Hausenblas & Carron, 1999). The fact that weight and success are in a way related, partly justifies these weight-related beliefs, hence complicates the identification and prevention of disordered eating in sport. Although a certain minimum weight might be helpful to perform, lowering weight or body fat should at least remain within realistic, personally set boundaries.

In addition, it seems that these -often unrealistic- beliefs in sport about links between sport performance and low weight/fat percentage worsen the common aesthetic appeal that is culturally imposed on women in our society. This is in line with the central reasoning of the cultural explanation of disordered eating assuming that societal beauty norms in Western cultures – especially for women – demand a thin and lean body (Hausenblas & Carron, 1999). The adolescent weight-related sport participants that were studied in the present thesis appeared to be particularly burdened with these societal pressures of the ideal physique and seemed to have profoundly internalized the belief that "thin is beautiful". Although elite athletes' bodies generally meet these societal demands more closely, certain women athletes in this thesis were not immune to these cultural body ideals and body objectifications either. In fact, some women athletes with disordered eating clearly recounted negative body evaluations within the daily life context, although their actual (athletic) bodies closely resembled our cultural ideals. Subsequently, it was suggested that these athletes seemed to disregard their opportunities for downward body comparisons in daily life. This would be in agreement with the results of Jansen, Smeets, Martijn, and Nederkoorn (2006) who showed that there appears to be lack of self-serving bias in the perceptions of eating disorder patients, an issue that needs further investigation.

It could also be argued that sport simply resembles society and that, particularly in aesthetic sports and dance, certain socio-cultural processes are ramified. In this thesis, several indications were found of objectifications of women athletes being judged on appearance (sometimes more than on their performance), athletes incorporating unrealistic body ideals, and the subsequent alienation from their bodies and display of damaging dieting behaviors. According to the Objectification Theory, these are common mechanisms in our society (Frederickson & Roberts, 1997). Nowadays, even stories about cosmetic surgery and breast reduction in women ballet dancers are no longer exceptional (Volkskrant Kunst Katern, 25-2-2009). For a long time, these body-changing phenomena were predominantly present in the glamorous sub cultures of actresses and fashion models, but it may be only a matter of time before these phenomena will also occur in sport. After all, the one thing the sport arena has in common with these sub cultures is the tendency of equalizing slenderness to success.

The role of body image in athletes' disordered eating

In this section, the main results concerning the role of body image in disordered eating in athletes and their compatibility with several theoretical body image frameworks will be considered. First, the findings in this thesis seem to fit with the notion of body image as a dynamic and changing concept (Schilder, 1935; 1978; Tiggemann, 2001). The results showed that body satisfaction appears to be altering as women athletes perceived themselves differently (in general more negatively) in sport than in daily life. These findings are in correspondence with previous qualitative studies in which body satisfaction transiency was also found among men and women athletes (Greenleaf, 2002; Krane, Waldron, Michalenok, & Stiles-Shipley, 2001; Loland, 1999). Athletes measure themselves differently with the eyes of others in relation to the predominant body ideal of their sport than to hegemonic ideals of society at large. In conclusion, it seems important to include the dynamic character of body image into future studies. The results in this thesis also indicated that it might be particularly interesting to explore dynamic body image changes surrounding competitions. So far, the dynamic body image approach appears to be quite underexposed in sport. According to Hausenblas and Symons Downs (2001) in their meta-analysis of 78 studies into body image in athletes, up till then, state versus trait dimensions of body image had not been examined.

Second, as previously mentioned, this thesis was embedded in a contextual body image framework to highlight the body image sensitivity to different contexts in general and the sport context in particular. The evidence showed that while body evaluations in daily life and sport greatly differed from each other in some women athletes, for others there appeared to be more similarity between these contexts. It appears as if contextual discrepancy and transient body satisfaction are affected by type of sport (e.g., masculine versus feminine sports), body demands related to specific performance requirements, and, subsequently, the extent to which the athlete's body fits within cultural body ideals. In this thesis, including mainly high performance women aesthetic and endurance athletes whose lean bodies are generally perceived as feminine and beautiful, body image was more positively evaluated in daily life than in sport. Reversibly, in previous qualitative studies in so called masculine sports (e.g., women rugby players), body satisfaction was higher in the sport context but dramatically decreased off the pitch (Krane et al., 2001). It should also be noted that women athletes with disordered eating in this thesis showed more congruency in being significantly more negative about several aspects of their body in both contexts than women athletes without disordered eating. This cross-situational consistency in body dissatisfaction seems to point towards a more general level of low body esteem (Tiggemann, 2001). At least, this might be applicable to the women athletes with disordered eating who adopted the narrative 'I might have gotten it anyhow' (see also Sundgot-Borgen, Skarderud, & Rodgers, 2003). In this thesis, these athletes pointed towards the daily life context as the origin of their disordered eating and they narrated about negative body evaluations in daily life as well as in sport. Tiggemann (2001) warned that findings of situational effects should not lead to underestimating the role of person

factors in body dissatisfaction. All in all, the findings in this thesis seem to support the conclusion that subjective body evaluation most likely has both stable and dynamic components (Tiggemann, 2001), as well as personal and situational aspects.

In conclusion, the findings in this thesis indicated that adopting a contextual framework seems to lead to a better understanding of eating disorder symptomatology in athletes and, therefore, should be seriously considered in future research designs. Although distinguishing between contexts might be difficult sometimes, the present thesis clearly showed that when the distinction between sport and daily life would not have been taken into account, the role of body image in athletes' disordered eating could have easily been underestimated and misunderstood. In this thesis, some athletes with disordered eating were identified to whom daily life and accompanying body ideals seemed rather irrelevant because of their exclusive athletic identity; they expressed that they predominantly evaluated themselves against the stricter body ideals of their sport. In this case, when there seems to be nothing but sport, the distinction between daily life and sport might have faded, but the influence of (athletic) body image would have been overlooked when body image was measured as a stable, context-independent concept using a general questionnaire. The absence of such a contextual approach in previous studies into the influence of body image on eating disorder symptomatology (e.g., Beals & Manore, 1994; Berry & Howe, 2000; Byrne & McLean, 2002; Smolak, Murnen, & Ruble, 2000; Torstveit, 2004; Williamson et al., 1995) might even have accounted for some of their equivocal and conflicting results.

Finally, the findings in this thesis seem to correspond with the idea that eating problems in athletes might differ from eating problems in the general population (Smolak et al., 2000; Sundgot-Borgen, 1993, Torstveit, 2004), in particular concerning the role of body image in athletes' dieting. Following that eating disorders in athletes were not always linked to body dissatisfaction, Sundgot Borgen proposed that a negative body image should be taken as a relative criterion for anorexia athletica. However, when applying a contextual perspective, the results in this thesis indicated that while the relationship between disordered eating and the athletic context seemed rather convincing, athletes with disordered eating did not always report body dissatisfaction in daily life. Subsequently, when integrating these results into the diagnostic criteria for anorexia athletica, it could be proposed that a negative athletic body image should be considered as an absolute criterion, and a negative daily life body image should be conceived as a relative criterion. Future studies should further investigate the validity of these suggestions.

Methodological limitations and future research

In this section, I will address some methodological considerations of the present thesis and provide guidelines for future research. Obviously, this thesis was subjected to a number of methodological limitations, such as limited sample sizes, and the use of one-item measures, unpublished Dutch translations, or new measures, which is more often the case in this type of research. In this instance, we recommend future studies to explore the possibility of including scales with multiple items, while we also acknowledge that further validation of the developed questionnaires in larger samples of various athletes is still needed.

Second, only the attitudinal, evaluative component of body image was included in the present thesis. Future studies should, therefore, consider integrating the perceptual component through exploring whether perceptual distortions (i.e., inaccurate judgments of one's body size) are also part of the body image disturbances of athletes with disordered eating (Gardner, 2001). More particularly, as previously mentioned, it is interesting to study whether athletes' self-perceptions differ from their body perceptions of others, consistent with the line of research of Jansen et al. (2006). If such perceptual differences exist, it should be investigated how they are related to the context of the reference group (i.e., daily life or sport) and the extent to which the athlete has developed an exclusive athletic identity; in other words to the importance that is attributed to daily life and sport, and subsequent internalizations of accompanying body ideals. Another useful contribution to the current research into contextual body evaluations could be including the relative importance of the body image dimensions, similar to the perceived importance of physical self-perceptions (Fox, 1987) or the orientation domain of the Multidimensional Body-Self Relations Questionnaire (MBSRQ; Cash, Winstead, & Janda, 1986).

Third, it should also be noted that our design was only correlational in nature. Subsequently, only statistically significant associations and so called risk correlates could be determined. Because it is unclear for many of these risk factors whether they preceded the onset of the eating disorder, it is impossible to determine whether they are triggers, symptoms, maintaining factors, or merely consequences (Jacobi et al., 2004). With the qualitative study in Chapter 5, rich detail of the development of eating disorders of six women athletes was provided, which shed light upon the predisposing, precipitating, and maintaining factors of disordered eating in athletes. Still, more research is needed, and governmental bodies and sport organizations are therefore called upon to support longitudinal monitoring of the mental development of young athletes in general and disordered eating development in particular.

Practical implications

In the present thesis, some women athletes mainly pointed towards daily life as the context in which their disordered eating originated. On top of that, they acknowledged that several sport-related influences triggered or worsened their eating disorder symptoms. Other athletes seemed to hold the sport context accountable as the starting point of their disordered eating. Despite the fact that the increased disordered eating prevalence in sport should not be fully attributed to sport participation, it is also clear that in many cases sport participation did not protect enough against the development of disordered eating either. Moreover, in some cases, sport participation clearly contributed to an increased eating disorder symptomatology. Subsequently, it could be argued that the sport environment should take greater responsibility in creating a safer environment concerning disordered eating, both from a perspective of performance enhancement and stimulating well-being. Throughout this thesis several factors were found that could be implemented into disordered eating-related prevention in sport and treatment programs for athletes in order to alleviate or fully free them from their eating disorder symptoms. These possible interventions are addressed below.

Sport federations and sport organizations

In line with other authors who advocated a change of rules in some sports in favor of disordered eating prevention (Torstveit, 2004), I argue that disordered eating might be prevented by means of considering implementing or extending legislation not only regarding underweight but also concerning weigh-ins and sports clothing. A good practice in this respect is known from the international ski jumping federation that subscribed that low body mass index scores (BMI below 20) have to be compensated by shorter skis in order to inhibit extreme weight loss. Athletes are measured directly after competition to prevent possible manipulations such as drinking water. The interventions resulted into experience, elasticity, and muscular strength becoming key factors for successful performance instead of low weight and youth. Consequently, weight is no longer a stress factor and the athletic careers of the ski jumpers are considerably extended (Volkskrant Sport Katern, 7 juni 2004). Comparable interventions are also known outside the sport arena, in the world of fashion, where underweight models with BMI below 18 were abandoned from the catwalks of Milan and Madrid in 2006 to make a statement against the idealizing of “size zero” and to become a healthier example to women and girls. In 2007, the British Fashion Council recommended the institution of health certificates for models and to sustain a minimum age of 16. Similarly, international and national sport bodies should not only intensify the debate about the necessity for at-risk sports to follow the examples given above, but also proceed to implement appropriate measures against unhealthy underweight and pathogenic weight control. In addition, they should reflect upon the recommendations of the Canadian Academy of Sport Medicine concerning the abandonment of regular public weigh-ins by coaches. More specifically, it was recommended that any necessary body measurement should be restricted to medical staff

or dieticians and be accompanied by a more general program of culture and attitude change (Carson & Bridges, 2001). Although these recommendations are not generally accepted in sport (Borms, 2003), one seems to agree to at least implementing a careful choice of measurement setting, reliable individualized interpretation of body-related data, and subsequent specialized treatment of athletes. As such, implementation could, thus, be seriously taken into consideration. Finally, the findings in this thesis clearly showed that there should be more discussion about the increasingly revealing nature of athletic women's sports clothing. Revealing clothing, according to some, is a commercial necessity for women sports to get more viewing ratings and funding[9], but, in fact, reflects and consolidates the cultural body objectification of women, which clearly affects women athletes. In this thesis, women athletes with disordered eating reported that the necessity of wearing tight and revealing sports clothing intensified their body awareness as well as the occurrence of interpersonal body comparisons, and as such negatively influenced their disordered eating. Therefore, (inter)national sport bodies and their representatives are summoned to promote women sports in a more healthy and women-friendly way and to stimulate equal participation of women in sports in which they are judged on their performance rather than on appearance.

Coach education and coaching style

Another possibility of preventing disordered eating is through implementation of educational programs for coaches and other staff members in order to increase their awareness of disordered eating. In this respect, sports personnel should be educated about signs, symptoms, and risk factors in order to stimulate early identification. They should also be taught how to best approach the (athlete with a) problem (Sherman, Thompson, DeHass, & Wilfert, 2005; Torstveit, 2004), as well as how to talk safely to athletes about dieting and weight loss.

Subsequently, educational programs should empower coaches to adopt a more effective approach of stimulating good nutrition and health that coincides with responsible weight loss programs run by dieticians. More importantly, education should encourage coaches to become more aware of their own impact concerning remarks and weight-related pressures. In this thesis, more dieting and pathogenic weight control was clearly evidenced in athletes who were surrounded by a coach who inflicted some kind of weight-related pressure on them. Moreover, athletes appeared to have a more negative body image when coaches evaluated the athletes' bodies unrealistically and made or encouraged upward body comparisons. To conquer weight-related coach pressure, it seems necessary to discuss and challenge irrational beliefs surrounding the idea that "thin is going to win".

[9] In 2004, the president of FIFA caused uproar by suggesting that "The women's game needs different sponsors from men's soccer and could attract these clients with the use of more feminine uniforms. Tighter shorts, for example… Pretty women are playing football today. Excuse me for saying that".

Furthermore, concerning general coaching, the findings supported the idea of adopting a democratic coaching style in which athletes are involved in decision making (Warriner & Lavallee, 2008) to sustain the development of conscious and resilient athletes. In addition, the achievement motivation framework also provides coaches with a tool for effective coaching. After all, less weight-related coach pressure and disordered eating were reported in a mastery-oriented motivational climate in which self-improvement and learning are emphasized rather than interpersonal competitiveness and extrinsic reinforcement. An increased risk for eating disorder symptomatology, on the other hand, was demonstrated in highly ego-oriented competitive athletes who focused on winning and interpersonal comparisons and non-elite sport participants doing sport for weight-related motives without being really overweight, both exhibiting extrinsic motivation. Since these extrinsically motivated women athletes seem to have been particularly subjected to body objectifications and self-objectifications, and seem to have internalized body-related ideals to a greater extent, they have perhaps become alienated from their body somehow and lost true contact with themselves. Consequently, coaches, trainers and teachers in sport, dance, and exercise are encouraged to foster the intrinsic value of sport and stimulate individuals to become more intrinsically motivated. In this respect, they should emphasize not-weight-related, more functional reasons to sport participation, such as gaining physical and mental strength. In addition, they should encourage athletes to perform their maximal best, and focus on personal progress and experiencing enjoyment.

Sports psychology and counseling

The findings in this thesis showed that more positive involvement by other staff members could empower coaches to work towards a healthier sports climate. Sport psychologists in particular could play an important role here. As athletes typically try to keep their problems away from their coach because they are afraid to jeopardize their athletic career, sport psychologists could step forward as the confidant person for athletes in distress. Sport psychologists should, therefore, also consider turning to more proactive questioning about possible side effects of elite sport participation to increase the chance of identifying disordered eating and other problems. In addition, they could instruct coaches about effective coaching, not only when they are requested to do so but also uninvited when they are just hired for mental training and notice certain imperfections.

Moreover, sport psychologists could also alleviate certain negative personal or cognitive influences through applying mental skills training. For example, with goal setting, debriefing, and cognitive training, the above described mechanisms such as extrinsic motivation, negative perfectionism, and unrealistic causal attributions, could be addressed. In addition, athletes could be taught a healthier stress-coping that helps them dealing with competitive anxiety more effectively. Needless to say that these interventions would be beneficiary to all athletes, not just the ones who are vulnerable to or actually suffer from disordered eating.

Dynamic changes surrounding competitions seem particularly relevant to address in the applied sport psychological practice. In this thesis, athletes mentioned how they dread having to reveal their bodies in competitions, how the revealing clothing intensified their interpersonal comparisons of bodies and bellies, and how these body competitions upfront affected their self-confidence and fully destroyed their preparations. Also after competitions they were upset when their bodies were exposed on television or pictures. All in all, their body concerns and irrational thoughts deteriorated their performances, harmed their self-feelings and, in the end, their eating patterns. Sport psychologists should, therefore, consider incorporating the theme of dynamic body image changes into their general mental training programs for performance enhancement.

Furthermore, the previous points seem to stress the importance of including sport-related influences concerning the athletic body image and weight-related performance beliefs into treatment programs for athletes with disordered eating. Rather than developing a more positive body image, when treating athletes with disordered eating one should at least focus on cognitive restructuring of unrealistic beliefs concerning links between lower weight and better performance. Hence, to make their treatment more effective, counselors should seriously consider to involve significant others from the athletic environment and adopt a multidisciplinary approach (Sherman & Thompson, 2006a).

Athletes

In a multidisciplinary approach it is necessary that athletes themselves are involved as well. Therefore, in this final section, we let athletes do some of the talking. Although the evidence of social influences by athletic peers or team-mates appeared to be somewhat more limited and implicit compared to what was found in other studies (e.g., Berry & Howe, 2000; Hausenblas & Carron, 2001), also in this thesis peer influence on disordered eating was demonstrated, as was illustrated by the following quote of a woman cyclist:

> At the international practices when we are sitting at the dinner tables with other teams, we are always talking about other girls' weight and say things like: "She has really gained weight, didn't she, she has really become fat". "Yes, yes, truly disgusting". We really keep an eye on that. We also talk about our own weight or fat percentage; those are truly the talk of the day. If you hear that someone has a lower fat percentage, you want that too. There is no true encouragement to lose weight, in fact, dieting is a taboo: everyone is doing it, but nobody talks about it.

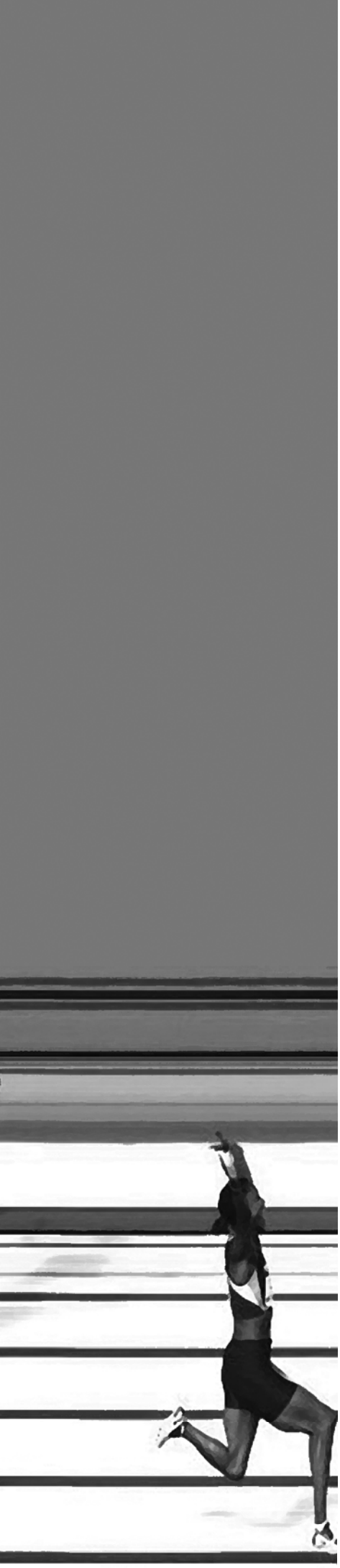
After the story of Leontien van Moorsel became public, it seems that there might be more awareness among the cyclists about the danger of dieting but the cycling culture in itself may not have changed that much. Once more, it is obvious that more action in sport is warranted to prevent disordered eating. There should be more debate with and among the athletes about building a healthy, constructive sports environment. In addition, athletes

should be provided with proper tools to deal with identity, body image and dieting issues more effectively.

Concluding remarks

In sum, the present thesis illustrated that several explanations for the increased eating disorder prevalence in athletes seem to have some validity, and that eating disorders should perhaps be taken as "biopsychosociocultural" phenomenon in which various biological, psychological, social and cultural risk factors could be distinguished (see also Bulik, Slof-Op 't Landt, Van Furth, & Sullivan, 2007). Rather than investigating "the" one causal explanation, one should focus on understanding the multiple variables that explain why a certain athlete is at-risk and develops a disturbed eating pattern from which he or she is not able to release oneself easily (De Cuyper, 2008). Among others, this thesis showed that narrative psychology (Crossley, 2000b) offers us a fruitful framework for research and counseling to determine those variables and to gain that understanding. After all, it provides us with the personal meaning of an athlete about what has influenced the development of disordered eating. In this respect it is not only interesting to ask about negative influences but also about any positive influences on athletes' well-being. Although it might have stayed somewhat underexposed in this thesis, the athletes did mention several positive and protective influences in the interviews. These range from the use of sport-related goals to support behavioral changes, reduction of stress and pressure, the opportunity to talk to someone, and mental training and dietary support supplied by specialists, to aiming for true identity formation and becoming more strong and resilient, which seem to be in agreement with our recommendations made above.

Hopefully this thesis has given some food for thought and will stimulate the sport environment to reflect and act. In the end, to defeat disordered eating in sport, it is not thin but fun that is going to win.



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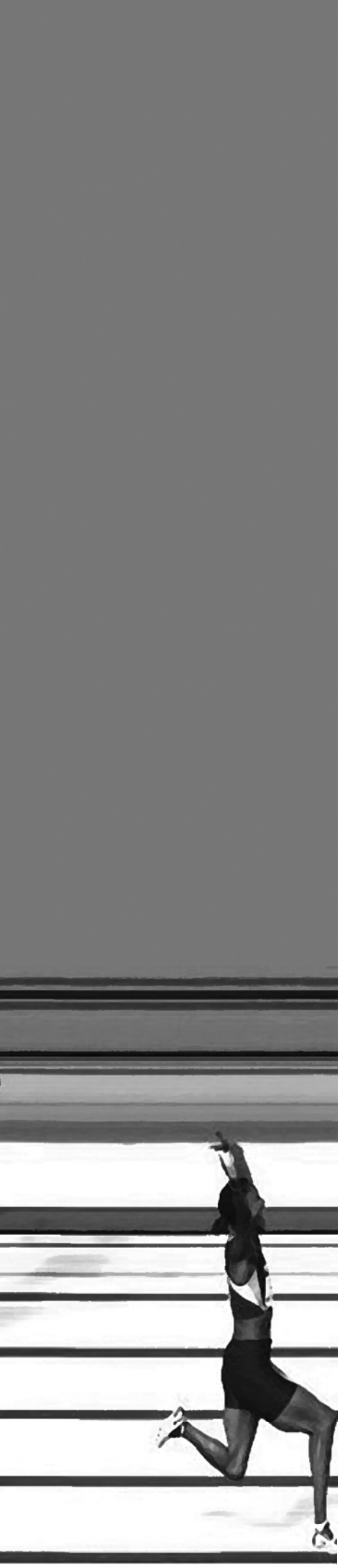


Appendices

Survey Study 1 – Dansversie (Dutch) (Chapters 2, 3, 6)

Hieronder volgt een aantal vragen. Lees iedere vraag en de daarbij horende (invul)instructie goed. Vul het antwoord in dat het beste bij je past. Er zijn geen goede of slechte antwoorden. Denk niet te lang na en geef je eerste indruk, die is meestal de beste. Vul alle vragen in en sla geen vragen over. Je antwoorden blijven gegarandeerd anoniem.

Omcirkel het cijfer dat het beste bij je past.

9. Wat vind je van je gezicht:
niet mooi 1 2 3 4 5 6 7 8 9 mooi

10. Wat vind je van de rest van je lichaam:
niet mooi 1 2 3 4 5 6 7 8 9 mooi

11. Vind je je lichaam:
te dun 1 2 3 4 5 6 7 8 9 te dik

12. Vind je je lichaam:
te klein 1 2 3 4 5 6 7 8 9 te groot

13. Doe je aan de lijn?
nooit 1 2 3 4 5 6 7 8 9 altijd

14. Hoeveel zou je willen wegen? ….. kilo

15. Het beeld dat je van je gezicht hebt, is:
negatief 1 2 3 4 5 6 7 8 9 positief

16. Het beeld dat je van de rest van je lichaam hebt, is:
negatief 1 2 3 4 5 6 7 8 9 positief

17. Jongens vinden mijn gezicht:
niet mooi 1 2 3 4 5 6 7 8 9 mooi

18. Jongens vinden mijn lichaam:
niet mooi 1 2 3 4 5 6 7 8 9 mooi

19. Meiden vinden mijn gezicht:
niet mooi 1 2 3 4 5 6 7 8 9 mooi

20. Meiden vinden mijn lichaam:
niet mooi 1 2 3 4 5 6 7 8 9 mooi

21. Welk rapportcijfer (van 1 t/m 10) geef je aan: je gezicht …
je lichaam …

Omcirkel het cijfer dat het beste bij je past.

27a. Mijn gewicht is voor mijn succes als leerling:
onbelangrijk 1 2 3 4 5 6 7 8 9 belangrijk

27b. Mijn lichaamsvorm is voor mijn succes als leerling:
onbelangrijk 1 2 3 4 5 6 7 8 9 belangrijk

27c. Mijn uiterlijke presentatie is voor mijn succes als leerling:
onbelangrijk 1 2 3 4 5 6 7 8 9 belangrijk

27d. Als ik niet goed presteer, geef ik mijn overgewicht de schuld:
mee oneens 1 2 3 4 5 6 7 8 9 mee eens

De volgende vragen gaan over hoe je bezig bent met voeding en lichaamsgewicht. Antwoord zo eerlijk mogelijk. Je antwoorden blijven gegarandeerd anoniem.

28. Heb je ooit ongecontroleerde vreetbuien gehad waarbij je erg grote hoeveelheden voedsel in zeer korte tijd hebt gegeten?
☐ ja ☐ nee
Zo ja, hoe vaak in de afgelopen drie maanden? …. keer per dag/week/maand*

29. Heb je ooit gesport of getraind met het specifieke doel om calorieën te verbranden of gewicht kwijt te raken / controleren?
☐ ja ☐ nee
Zo ja, hoe vaak in de afgelopen drie maanden? ….uren per dag/week/maand*

30. Heb je ooit gevast of je aan een streng dieet gehouden om gewicht kwijt te raken?
☐ ja ☐ nee
Zo ja, hoe vaak in de afgelopen drie maanden? …. keer per dag/week/maand*

31. Heb je ooit bewust braken opgewekt vlak na de maaltijd om het gegeten voedsel zo snel mogelijk weer kwijt te raken?
☐ ja ☐ nee
Zo ja, hoe vaak in de afgelopen drie maanden?…. keer per dag/week/maand*

32. Heb je ooit afslankmiddelen of vochtafdrijvende middelen (diuretica, plaspillen) gebruikt om gewicht kwijt te raken?
    ☐ ja ☐ nee
    Zo ja, hoe vaak in de afgelopen drie maanden? …. keer per dag/week/maand*

33. Heb je ooit laxeermiddelen of zetpillen gebruikt om gewicht kwijt te raken?
    ☐ ja ☐ nee
    Zo ja, hoe vaak in de afgelopen drie maanden? …. keer per dag/week/maand*

De volgende stellingen hebben betrekking op de sfeer in jouw klas.
Geef van elke stelling aan in hoeverre je het ermee eens bent.

	In deze klas …	helemaal oneens <<			>> helemaal eens	
41	Maken leraren opmerkingen over het gewicht van de leerlingen	1	2	3	4	5
42	Worden leerlingen erg op hun uiterlijk beoordeeld	1	2	3	4	5
43	Wordt regelmatig aandacht besteed aan goede en gezonde voeding	1	2	3	4	5
44	Worden leerlingen door leraren aangespoord om te gaan lijnen	1	2	3	4	5
45	Wordt door de leerlingen regelmatig over lijnen of diëten gesproken	1	2	3	4	5
46	Nemen leerlingen slechte eetgewoonten van elkaar over	1	2	3	4	5
47	Word je gepest als je te dik bent of er onaantrekkelijk uitziet	1	2	3	4	5
48	Zijn er ouders die zich zorgen maken over het gewicht van hun kinderen	1	2	3	4	5
49	Worden leerlingen als ze niet goed presteren gewezen op hun gewicht	1	2	3	4	5
50	Ken ik leerlingen die er ongezonde afvalmethoden op na houden	geen	enkele	redelijk wat	veel	heel veel

Note. Items that were not analysed in this thesis were excluded from this Appendix. Items 9-21 and 28-33 are adapted from the Body Image Questionnaire (Woertman, 1994) and Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991). An English translation is available in this thesis and/or the journals in which the manuscripts were published. In addition, the questionnaire included the Contour Drawing Rating Scale (Thompson & Gray, 1995), Task and Ego Orientations in Sport Questionnaire (TEOSQ; Duda & Whitehead, 1998), Perceived Motivational Climate in Sport Questionnaire (PMCSQ; Seifriz, Duda, & Chi, 1993), subscale perfectionism of Eating Disorder Inventory-2 (EDI-2; Garner, 1991), and Rosenberg Self Esteem Scale (RSES; Rosenberg, 1989).

Survey Questions Study 2 (Chapter 4)

Contextual Body Image Questionnaire for Athletes (CBIQA)

	In daily life, … Concerning my sport, …	Very ugly	Ugly	Somewhat Ugly	Neither, ugly, nor beautiful	Somewhat Beautiful	Beautiful	Very beautiful
a	I think **my appearance** is: [a]	1	2	3	4	5	6	7
b	I think **my appearance** compared to others is:	1	2	3	4	5	6	7
c	others think **my appearance** is:	1	2	3	4	5	6	7

	In daily life, … Concerning my sport, …	Much too thin	Too thin	Somewhat too thin	Neither too thin, nor too fat	Somewhat too fat	Too fat	Much too fat
a	I think **my body shape** is:	1	2	3	4	5	6	7
b	I think **my body shape** compared to others is:	1	2	3	4	5	6	7
c	others think **my body shape** is:	1	2	3	4	5	6	7

	In daily life, … Concerning my sport, …	Much too unmuscular	Too unmuscular	Somewhat too unmuscular	Neither too unmuscular, nor too muscular	Somewhat too muscular	Too muscular	Much too muscular
a	I think the **muscularity** of my body is:	1	2	3	4	5	6	7
b	I think the **muscularity** of my body compared to others is:	1	2	3	4	5	6	7
c	others think the **muscularity** of my body is:	1	2	3	4	5	6	7

	In daily life, … Concerning my sport, …	Much too low	Too low	Somewhat too low	Neither too low, nor too high	Somewhat too high	Too high	Much too high
a	I think **my body weight** is:	1	2	3	4	5	6	7
a	I think **my fat percentage** is:	1	2	3	4	5	6	7
b	I think **my body weight** compared to others is:	1	2	3	4	5	6	7
b	I think **my fat percentage** compared to others is:	1	2	3	4	5	6	7
c	others think **my body weight** is:	1	2	3	4	5	6	7
c	others think **my fat percentage** is:	1	2	3	4	5	6	7

[a] The original Dutch verb 'vinden' refers to both to think and to feel.

a own perception; b own perception compared to others; c perceived opinion of others.

Interview guide Study 3 (Chapter 5)

1. Can you give me an overview of your sport career?

2. Can you tell me your history regarding eating? Where and when did it go wrong?
   Eating disorder facts (start, type/diagnosis, course, current situation)

3. What influenced your eating problems?
   Why do you think your eating problems existed? From where did it originate?
   Which factors maintained or even deteriorated your eating problems?
   Which factors diminished or helped your eating problems disappear?

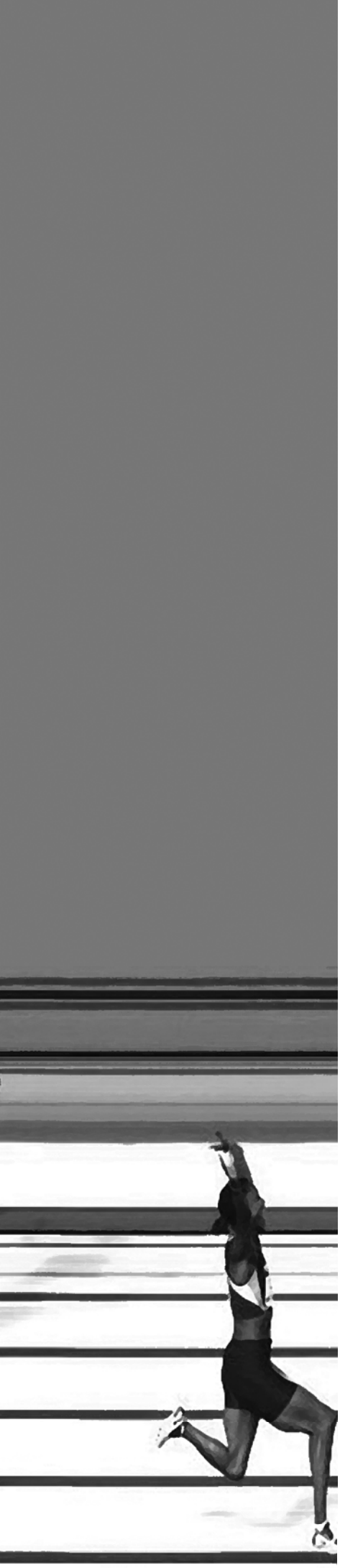
4a. What/whom from the daily life context influenced your eating problems? How?
 b. What/whom from the sport context influenced your eating problems? How?
 c. Which influence was the largest, the influence of daily life or sport?
   When it originated, maintained, worsened, and diminished? Please explain.

5. Explain of the following factors from the context of daily life:
   a. How you experienced it; b) if, and how it contributed to your eating problems?
   - body image; how you evaluate your own body; how satisfied you are with your body; how others evaluate your body; body comparisons, upward and downward;
   - parents/family; how they dealt with eating, dieting, body comparisons? Particular comments or pressure concerning body weight, fat percentage, appearance? How did those affect you?
   - Your peers/friends/classmates; how they dealt with eating, dieting, body comparisons? Particular comments or pressure concerning body weight, fat percentage, appearance. Competitive thinness?
   - Concerning your eating problems, are there any other important factors from daily life?

6. Explain of the following factors from the context of sport:
   a. How you experienced it; b) if, and how it contributed to your eating problems?
   - body image; how satisfied you are with your body; how you evaluate your own body; how others evaluate your body; body comparisons upward and downward;
   - trainers/coaches/other coaching staff; how they dealt with eating, dieting, body comparisons? Particular comments or pressure concerning body weight, fat percentage, appearance? Group weigh-ins. How did those affect you?
   - Your teammates/peers in sport; how they dealt with eating, dieting, body comparisons? Particular comments or pressure concerning body weight, fat percentage, appearance? Competitive thinness?
   - Prevailing/personal ideas on the relationship between low weight/body shape and performance; attributing success and failure to weight, fat percentage, et cetera?
   - During the course of the interviews the factor (revealing) sports clothing was added.

7. Are there other factors that will help to understand your ED that we did not discuss yet?

8. To assess impact and to stimulate closure, the respondents were asked how they looked back on the interviews.



Summary

Thin is going to win? Disordered eating in sport

An increased prevalence of eating disorder symptomatology has been repeatedly reported in elite women athletes in comparison with non-elite athletes or non-athletes, particularly in aesthetic sports (e.g., gymnastics, synchronized swimming, dance), weight-class sports (e.g., judo, rowing), and endurance sports (e.g., cycling, swimming). Another group of sport participants in which eating disorders have been often found consists of individuals who exercise out of weight-related motivation. These results raise the question why certain athletes are more vulnerable to the development of eating problems. The current thesis aims at broadening our understanding of eating problems in these groups of women athletes. Three studies were conducted to answer the question how the heightened vulnerability of certain athletes to the development of eating problems could be explained. The first research project encompassed different themes that were captured in three separate chapters, Chapters 2, 3, and 6. In Chapter 2, dieting behaviors in the general Dutch female adolescent population were investigated, particularly those of adolescent girls who participate in sport out of weight-related motives. In Chapter 3, part of this adolescent control group was compared to a sample of elite and non-elite gymnasts. Not only do eating problems seem to be more prevalent in elite women athletes, but it was also suggested in previous studies that eating disorders in athletes differ in comparison with those in non-athletes, for example concerning the role of body image and the athletes' desire to perform. The core part of this thesis consisted of investigating the influence of the multidimensional body image on eating problems in athletes, which is discussed in Chapters 3, 4, and 5. In Chapter 6, the relationships of athletes' disordered eating correlates with performance-related variables were investigated.

As previous studies in samples of exercisers have shown that the presumed benefits of sport tend not to be experienced by individuals who are motivated to exercise for weight-control or appearance related reasons, it was studied whether these relationships could also be found in a general sample of adolescent girls and women mainly participating in sport activities outside the exercise arena. The results in Chapter 2 indicated that also among younger adolescent women, those who participated in sport at least once a week with the specific purpose of burning calories exhibited more dieting and pathogenic weight control behaviours, and showed a more negative body image as well as lower self esteem than girls who participated in sport for other reasons or girls who did not participate in sport at all. Parallel to what is known from American and Australian studies, it was concluded that dieting and body image-related problems are common in the general Dutch female adolescent population, particularly in weight-related sport participants, and warrant special attention.

In Chapter 3, the dieting behaviours and body image of (part of) the adolescent control group from the second chapter were compared to those of elite and non-elite gymnasts. The elite gymnasts reported a higher dieting frequency and more pathogenic weight control than non-elites or controls, confirming that elite gymnasts are an important risk group for eating disorder symptomatology. Furthermore, it was found that gymnasts, both elites and non-elites, dieted more frequently despite being relatively satisfied with their body. More importantly, the findings suggested that gymnasts' dieting behaviours seemed related to body image in a different way than the controls' dieting as the athletes' feelings of being overweight were not significantly related to their perceived appearance. Moreover, in gymnasts several sport-specific variables seemed more important, such as weight-related coach pressure and the perceived importance of weight, body shape and appearance to performance, which was captured with the concept "weight-related causal attributions of success and failure". Rather than believing that "thin is beautiful", gymnasts seemed convinced or persuaded that "thin is going to win". These results implicated that distinguishing between body image in the context of daily life and body image in the athletic context might contribute to the clarification of eating problems in athletes, which was further explored in Chapters 4 and 5.

In the study presented in Chapter 4, the influence of body image on athletes' disordered eating was studied from a contextual and more dynamic perspective in a sample of high performance women athletes with and without disordered eating who mainly competed in aesthetic and endurance sports. For this, a new questionnaire was developed as existing ones were not suitable for investigating the multidimensional body image of athletes in athletic and daily life contexts. The validity and reliability of the Contextual Body Image Questionnaire for Athletes was tested in a general population of female athletes and exercisers, and appeared to be quite satisfactory. The research findings showed that athletic body image, and more specifically self-perceptions of weight, shape and fat percentage in the context of sport as well as the perceived "thin-fat opinions of others" made significant unique contributions to explaining eating disorder variance. Body satisfaction appears to be transient because high performance women athletes perceive themselves differently in sport compared to daily life. In many women athletes a more negative athletic body image than daily life body image was found. Women with disordered eating, however, seemed quite negative about their body in both contexts when compared to women athletes without disordered eating. In conclusion, the contextual body image framework seems to lead to a better understanding of eating disorder symptomatology in high performance athletes. The contributions of daily life and sport to disordered eating in athletes and the processes through which this occurred were further explored in a qualitative study.

In Chapter 5, the results of interviews with six elite women athletes were presented. In the past seven years I have worked with these athletes who suffered from an eating disorder at that time. The athletes were asked to share their stories on how they had dealt with food in

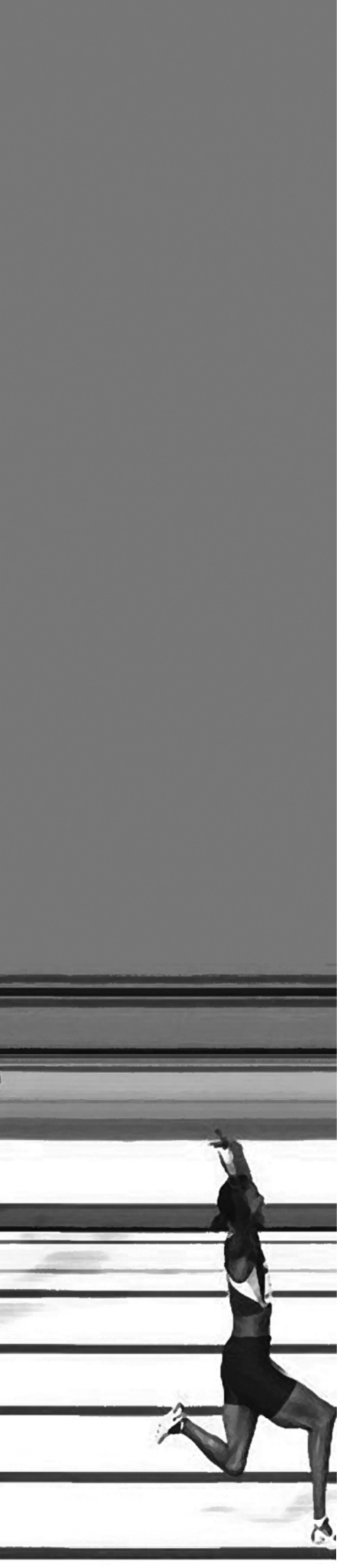
their life and which factors had contributed to their eating disorder. The findings supported the conclusions of our quantitative study presented in Chapter 4. They indicated that, together with daily life influences such as family influences and certain personality characteristics which made the athletes more susceptible, sport-related influences contributed in particular to the development of their disordered eating. Among the examples that were given were the necessity of wearing revealing sports clothing, coaches who pressurized athletes through specific comments on their bodies, and the subjection to frequent public weigh-ins, which made the athletes highly self-aware. The athletes clearly stated that these experiences led to negative body-evaluations and upward body comparisons with better-off peers in the context of sport. Inspired by the conviction that "thin is going to win" factors such as negative performance evaluations and deteriorating performances worsened their disordered eating. The same holds for competitive stress and not being able to cope with it effectively, which acted as one of the maintaining factors.

Performance-related variables that seemed relevant for explaining the development or maintenance of disordered eating in women athletes were further explored in Chapter 6 in which the relationships between disordered eating and the central aspects of goal achievement theory (motivational climate and individual goal orientations) were investigated in a sample of 94 highly competitive female gymnasts and dancers. The study showed that in ego-oriented individuals who are motivated to outperform others, and in a performance motivational climate in which winning is crucial, the phenomena of weight-related coach and peer pressure appeared to be more common just as the presence of other disordered eating correlates such as the use of weight control methods, lower self-esteem and more perfectionism. It was concluded that ego orientation significantly explained dieting variance, that is, aesthetic performers who were highly ego oriented exhibited more frequent dieting. These athletes seemed more at risk for disordered eating, perhaps due to the philosophy that all is fair in winning, or perhaps due the presence of 'competitive thinness', which will be more common when feeling inclined to interpersonal comparisons. Not surprisingly, it was also shown that a mastery motivational climate aiming at personal development plays a protective role against disordered eating.

The final chapter provides a summary of the main findings of the studies presented in the thesis and a discussion of their theoretical and practical implications. In search for an explanation for their heightened vulnerability to the development of eating problems, some women athletes believed that "they might have gotten it anyhow" and pointed towards the daily life context as the origin of their problems. On top of that they acknowledged that certain sport influences triggered or worsened their disordered eating. Others seemed to hold the sport context accountable as the starting point of their disordered eating. In addition to explanations pertaining to cultural and sport-environmental factors, our findings also indicated that certain personality variables were found to exert influence on disordered eating.

Furthermore, implications for the concept body image and its role in athletes' disordered eating were considered. Together, our results indicated that a more dynamic and contextual approach to body image seems necessary for a better understanding of disordered eating development in high performance athletes. If body image was measured as a stable and context-independent concept, thus without distinguishing between the contexts of sport and daily life, the influence of body image in athletes' disordered eating could thus be underestimated.

Finally, several recommendations for prevention and treatment of disordered eating in sport were formulated for coaches, sport psychologists, and sport federations aiming at a protective sports environment, and supporting the development of well-balanced and resilient athletes. It was proposed, for example, that the sports milieu could consider extending legislation, and increase the awareness regarding underweight, weigh-ins, and sports clothing. Moreover, educational programs for coaches and other staff members should be implemented to increase their awareness of disordered eating and of their own impact. In addition, special attention was paid to the framework of extrinsic versus intrinsic motivation. In this thesis, the presence of extrinsic motivation was demonstrated in both groups at-risk for eating disorder symptomatology, the non-elite sport participants doing sport for weight-related motives without being overweight and the highly ego-oriented competitive athletes who were fixed on winning and interpersonal comparisons. Consequently, it was advocated to promote the intrinsic value of sport. In this respect, coaches and trainers should foster a mastery climate with its emphasis on self-improvement, cooperation and learning which seemed to protect against disordered eating. Furthermore, it was proposed how certain sport-related influences could be incorporated in prevention and treatment programs for athletes. Besides the development of a more positive body image, one should focus, for example, at cognitive restructuring of unrealistic beliefs concerning links between lower weight and better performance. To defeat disordered eating in sport, it is not thin but fun that is going to win.



Summary in Dutch (Samenvatting)

Leidt een laag gewicht wel tot winst? Verstoord eetgedrag in de sport

Eetproblematiek komt veelvuldig voor bij topsporters, zo blijkt uit onderzoek. Vooral esthetische sporten (denk aan turnen, dans), sporten met gewichtsklassen (bijv. judo, worstelen) en duursporten (wielrennen, zwemmen) worden in dit verband als sporttakken met een verhoogd risico beschouwd. Sporters bij wie ook met regelmaat eetstoornissen worden aangetroffen, zijn sportschoolbezoekers die gaan fitnessen om af te vallen of er lichamelijk beter uit te willen zien. Deze gegevens roepen de vraag op waarom bepaalde sporters blijkbaar meer risico lopen om eetproblemen te ontwikkelen dan andere. Dit proefschrift heeft als doel antwoord te geven op deze vraag. Drie studies zijn uitgevoerd waarin getracht wordt verklaringen te vinden voor de verschillen tussen sporters in de mate waarin zij kans lopen eetproblematiek te ontwikkelen.

Over het algemeen heeft sportbeoefening een gunstige invloed op iemands lichamelijk en geestelijk welbevinden. Onderzoek in onder andere de VS heeft echter een aantal jaar geleden al laten zien dat die gunstige effecten niet of veel minder worden ervaren door mensen die regelmatig naar een sportschool of fitnesscentrum gaan en die primair worden gemotiveerd door de wens er beter uit te zien. De motivatie waarmee mensen sporten, lijkt dus van belang bij de samenhang tussen sportbeoefening en welbevinden. In Hoofdstuk 2 is nagegaan of dit ook het geval is bij sportbeoefening buiten de sportschool. De resultaten toonden aan dat jonge meiden tussen de 12 en 18 jaar, die regelmatig sporten om af te vallen, minder zelfvertrouwen hebben en negatiever over hun eigen lichaam denken. Daarbij doen ze vaker aan de lijn en gebruiken ze vaker ongezonde lijnmethoden (zoals braken, laxeermiddelen, afslankpillen en vasten) dan meiden die om andere redenen sporten of helemaal niet aan sport doen. Hoewel de opzet van de studie geen conclusies over oorzaak-gevolgrelaties toelaat, maken de resultaten duidelijk dat als de motivatie om te sporten ligt in de wens om af te vallen, er geen sprake is van de dikwijls gerapporteerde positieve relatie tussen sportbeoefening en welbevinden.

Een deel van de groep die in Hoofdstuk 2 werd beschreven, vormde de controlegroep in Hoofdstuk 3 waarin een vergelijking werd gemaakt tussen turnsters en hun leeftijdsgenoten in de controlegroep. Topturnsters bleken gemiddeld genomen frequenter te lijnen en meer ongezonde lijnmethoden te gebruiken dan turnsters die op een lager niveau turnen of de meiden uit de controlegroep. Dit bevestigde ons vermoeden dat topturnsters een belangrijke risicogroep vormen voor de ontwikkeling van eetproblematiek. Waar de helft van de topturnsters ooit wel eens een ongezonde lijnmethode heeft gebruikt, was dat het geval bij een kwart van de turnsters op lager niveau en bij ongeveer een derde van de controlegroep. Daarbij spelen problemen met lichaamsbeeld en lijngedrag bij adolescente meiden ook op grote schaal en is speciale aandacht hiervoor zeker op zijn plaats.

Uit de resultaten bleek ook dat lijngedrag en lichaamsbeeld bij turnsters anders samenhangen dan bij de controlegroep. Turnsters deden aan de lijn terwijl ze eigenlijk relatief tevreden waren over hun eigen lichaam. Turnsters die zich te dik voelden, vonden zichzelf bovendien niet per definitie onaantrekkelijk. Sportgerelateerde zaken, zoals een coach die druk uitoefent om af te vallen en de mate waarin gewicht, lichaamsvorm en uiterlijk door de sporter van belang worden geacht om te presteren, bleken sterker gerelateerd aan hun lijngedrag. In plaats van het idee "thin is beautiful", lijken turnsters meer overtuigd van het motto "thin is going to win". Dit impliceert dat eetproblematiek in de sport wellicht beter begrepen kan worden door een onderscheid te maken tussen het lichaamsbeeld in het dagelijks leven en het sportlichaamsbeeld, een onderscheid dat centraal staat in Hoofdstuk 4 van dit proefschrift.

In Hoofdstuk 4 is de invloed van lichaamsbeeld bestudeerd vanuit een meer contextueel en dynamisch perspectief bij een groep vrouwelijke topsporters met en zonder verstoord eetgedrag die voornamelijk in esthetische sporten en duursporten actief waren. Omdat bestaande vragenlijsten niet geschikt zijn om verschillende aspecten van het lichaamsbeeld van sporters in het dagelijks leven en de sport te meten, is een nieuwe vragenlijst ontwikkeld. De interne validiteit en betrouwbaarheid van deze nieuwe vragenlijst werden onderzocht in een steekproef van vrouwelijke sporters en fitnessers en bleken acceptabel. Het sportlichaamsbeeld bleek een belangrijke verklaring voor het verstoord eetgedrag. In het bijzonder de manier waarop sporters zelf hun gewicht, lichaamsvorm en vetpercentage beoordelen en hoe zij denken dat anderen uit de sport naar deze aspecten kijken, bleken in dit verband belangrijke aspecten van het sportlichaamsbeeld. Uit het onderzoek komt ook naar voren dat lichaamstevredenheid ten minste voor een deel contextgebonden lijkt, want topsporters beoordelen zichzelf anders in de sport dan in het dagelijks leven. Velen van hen waren beduidend negatiever over hun lichaam in de sport dan daarbuiten. Sporters met eetproblematiek bleken hierbij negatiever over diverse lichaamsaspecten in beide contexten dan sporters zonder eetproblematiek. Een contextuele blik op lichaamsbeeld geeft dus meer inzicht in eetproblematiek in de sport. De processen waardoor het dagelijks leven en de sport bijdragen aan eetproblemen bij sporters zijn verder onderzocht in kwalitatief onderzoek.

Dit kwalitatieve onderzoek bestaande uit interviews met zes vrouwelijke topsporters met eetproblematiek waarmee ik in de afgelopen jaren in mijn sportpsychologiepraktijk heb gewerkt, is beschreven in Hoofdstuk 5. Aan de sporters is gevraagd te vertellen over hoe zij met eten in hun leven zijn omgegaan en de factoren die hebben bijgedragen aan hun verstoorde eetgedrag. De uitkomsten lagen in het verlengde van Hoofdstukken 3 en 4 en suggereerden dat het vooral de invloeden uit de sport zijn geweest die hebben bijgedragen aan de ontwikkeling van eetproblematiek. Familie- en persoonlijkheidsfactoren bleken de sporters op een bepaalde manier kwetsbaarder hebben gemaakt. Negatieve invloeden die regelmatig naar voren werden gebracht waren de noodzaak om strakke, weinig verhullende sportkleding te dragen en coaches die de sporters onder druk zetten door

opmerkingen over hun lichaam te maken of hen regelmatig aan publieke gewichtsmetingen te onderwerpen. Naar eigen zeggen werden ze zich hyperbewust van hun lichaam, waardoor ze negatiever over hun eigen lichaam gingen denken en zichzelf gingen vergelijken met andere, dunnere meiden uit de sport. Door teleurstellende en tegenvallende prestaties verergerde hun eetproblematiek omdat ze zich sterk lieten leiden door de overtuiging "thin is going to win". Ook het gegeven dat ze niet effectief om konden gaan met de enorme druk en grote wedstrijdspanning droeg bij aan het in stand blijven van hun problemen.

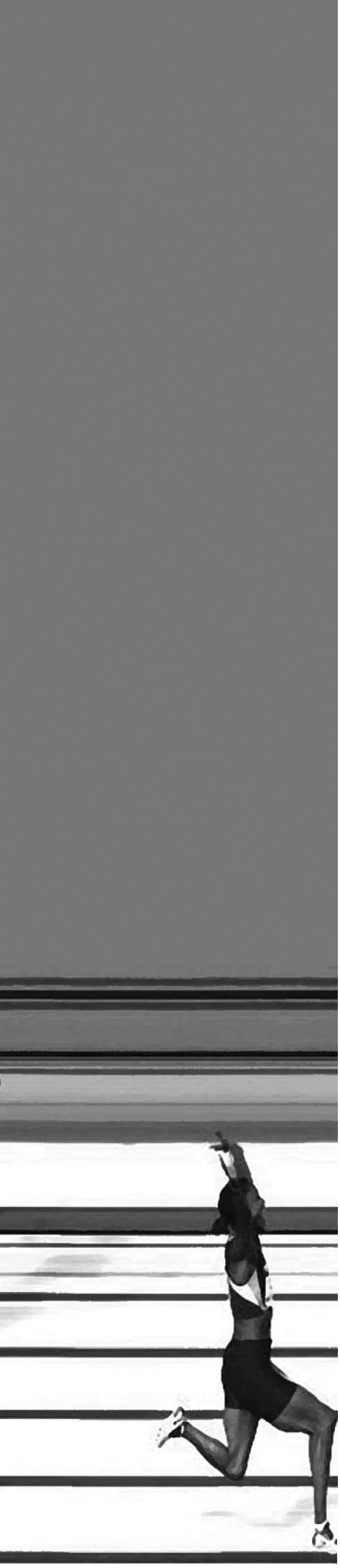
De relevantie van succes en presteren voor eetproblematiek in de sport is verder onderzocht in Hoofdstuk 6 waarin de relaties met prestatiemotivatie (zowel de individuele oriëntatie als het motivatieklimaat in de omgeving) in kaart is gebracht bij een groep competitieve turnsters en dansers. Verschillende tekenen van verstoord eetgedrag, zoals frequente, pathologische gewichtscontrole en gewichtsgerelateerde druk van coaches en teamgenoten, waren vooral aanwezig in zogenoemde egogeoriënteerde sporters en een prestatieklimaat waarin gevoelens van succes ontleend worden aan winnen en de vergelijking met anderen. De ego-oriëntatie, meer nog dan het klimaat, bleek samen te hangen met het verhoogde risico op eetproblematiek. Wellicht speelt de filosofie dat alles geoorloofd is om te winnen, kenmerkend voor deze sporters, hier een rol. Ook kan "competitive thinness", wat eerder zal optreden bij egogeoriënteerde sporters die geneigd zijn zichzelf met anderen te vergelijken, een mogelijke oorzaak vormen voor deze samenhang. Een zogenoemd leerklimaat, dat focust op persoonlijke vooruitgang, bleek juist tegen eetproblematiek te beschermen.

Het laatste hoofdstuk (de epiloog) geeft een overzicht en samenvatting van de belangrijkste bevindingen van dit proefschrift en diverse theoretische en praktische implicaties. Op zoek naar een verklaring voor de ontwikkeling van hun eetproblemen, kwam in Hoofdstuk 5 al naar voren dat sommige sporters de sportomgeving verantwoordelijk hielden voor hun problemen. Andere sporters geloofden dat ze deze problemen in ieder geval wel zouden hebben gekregen, ook zonder hun sportloopbaan; zij wezen vooral naar het dagelijks leven als oorsprong voor hun eetproblematiek. Daarbij vonden ze wel dat bepaalde invloeden uit de sport hun problematiek in stand hadden gehouden of zelfs hadden verergerd. Hierin vinden we evidentie dat invloeden uit de cultuur, de sportomgeving en iemands persoonlijkheid alle drie een rol spelen bij het ontstaan van verstoord eetgedrag bij sporters.

Ook wordt in de epiloog aandacht geschonken aan de bijzondere rol van het lichaamsbeeld bij eetproblematiek van sporters. Een van de conclusies luidt dat als lichaamsbeeld niet als dynamisch, contextueel concept wordt beschouwd, dus zonder de contexten dagelijks leven en sport erbij te betrekken, de invloed van lichaamsbeeld op verstoord eetgedrag van sporters gemakkelijk kan worden onderschat.

Tot slot zijn diverse aanbevelingen voor preventie en behandeling van verstoord eetgedrag in de sport geformuleerd. Deze zijn gericht aan sportorganisaties, coaches, sportbegeleiders en sportpsychologen en beogen een meer beschermend sportklimaat te scheppen en de weerbaarheid van sporters te vergroten. Voorbeelden in dit verband zijn aanpassing van reglementen (o.a. ten aanzien van sportkleding) en het vergroten van het bewustzijn van factoren die kunnen leiden tot verstoord eetgedrag (o.a. ondergewicht en het meten van gewicht 'en public'). Scholing van coaches en anderen die zijn betrokken bij de begeleiding van sporters over signalen die kunnen wijzen op eetproblematiek is een ander voorbeeld van een maatregel waarvan een positieve invloed verwacht mag worden. Vooral coaches zouden zich er verder van bewust moeten zijn dat hun eigen houding dikwijls grote invloed heeft en zowel beschermend als risicovergrotend kan werken.

Tevens is aandacht geschonken aan intrinsieke versus extrinsieke motivatie. In dit proefschrift is extrinsieke motivatie aangetoond in beide groepen vrouwelijke sporters die een verhoogd risico op eetproblematiek blijken te lopen: de recreatieve sporters die sporten om er beter uit te zien, en de egogeoriënteerde topsporters die gefixeerd zijn op vergelijking met anderen. Daarom is ervoor gepleit de intrinsieke waarde van sport meer te promoten. Coaches en trainers zouden een leerklimaat moeten koesteren, want het benadrukken van persoonlijke verbetering en samenwerking lijkt sporters te beschermen tegen verstoord eetgedrag. Verder is voorgesteld om bepaalde sportgerelateerde invloeden te betrekken in preventie en behandelprogramma's voor sporters. Naast de ontwikkeling van een positief lichaamsbeeld, is het belangrijk te focussen op het ombuigen van onrealistische overtuigingen dat een lager gewicht altijd tot betere prestaties zou leiden. Een focus op plezier levert meer winst op in de strijd tegen verstoord eetgedrag in sport.



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Curriculum Vitae

Karin de Bruin (1972) has a degree in clinical & health psychology (Utrecht University, 1995) and sport psychology, as well as a European master in sport & exercise psychology (VU University, 2001). She is a member of the Dutch Institute for Psychologists (PSYCHOLOOG NIP), the Dutch Association of Sport Psychologists (docent & praktiserend sportpsycholoog VSPN®), and the European Network Young Specialists in Sport Psychology (ENYSSP). She is currently a member of the VSPN board.

Between 2002 and 2008 she was employed as lecturer and researcher at the Faculty of Human Movement Sciences of the VU University Amsterdam. Since is currently running a private practice for mental training and counselling of athletes, dancers, and performers, or their trainer/coaches, which she started in 2003.

Karin offers her services to a range of sport types (e.g., ball sports, cycling, dance, gymnastics, rowing, speed skating, swimming, track-and-field athletics). She is a permanent mental consultant of Lucia Marthas Dansacademie, Nationaal Zweminstituut Amsterdam (NZA), and Centrum voor Topsport en Onderwijs (CTO Amsterdam). She also works for the Dutch Olympic Committee (NOC*NSF) as a confident person / advisor on sexual harassment in sport.

Her mission is to stimulate optimal performance and to contribute to a safe, healthy and highly accessible sports environment for all athletes, irrespective of gender, age, sexual orientation, ethnic descent, religion, and (dis)ability.

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In addition to the manuscripts in this thesis and several Dutch publications, the following abstracts are published in congress proceedings:

De Bruin, A. P. (2009). *Female Athlete Triad (key note).* Sportvoedingscongres, Ede.

De Bruin, A. P., Bakker, F. C., Oudejans, R. R. D., Woertman, L. (2009). *The other side of elite sport (symposium).* 12th World Congress of Sport Psychology, ISSP, Marrakesh, Morocco.

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