



**HAL**  
open science

## Effects of Achievement Goals on Female Aesthetic Athletes' Disordered Eating Attitudes

Stéphanie Scoffier-Mériaux, Karine Corrion, Fabienne d'Arripe-Longueville

► **To cite this version:**

Stéphanie Scoffier-Mériaux, Karine Corrion, Fabienne d'Arripe-Longueville. Effects of Achievement Goals on Female Aesthetic Athletes' Disordered Eating Attitudes. *Science & Sports*, 2013, 10.1016/j.scispo.2013.04.001 . hal-02524808

**HAL Id: hal-02524808**

**<https://hal.univ-cotedazur.fr/hal-02524808>**

Submitted on 30 Mar 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Manuscript Number: SCISPO-D-13-00018R1

Title: Effects of Achievement Goals on Female Aesthetic Athletes' Disordered Eating Attitudes

Article Type: Full Length Article

Keywords: achievement motivation; eating disorders; elite sport

Corresponding Author: Dr. Stéphanie Scoffier,

Corresponding Author's Institution: Université de Nice Sophia Antipolis, LAMHES, EA 6309;  
Université de Toulon, LAMHES, EA 6309, 83957

First Author: Stéphanie Scoffier

Order of Authors: Stéphanie Scoffier; CORRION Karine, Dr; D'ARRIPE-LONGUEVILLE Fabienne, Pr

Abstract: Objective: This study examined how achievement goals are related to athletes' eating disorders. Method: The sample consisted of 196 female adolescents involved in aesthetic sports at an elite level. Data were examined through structural equation modeling.

Results: The data showed that performance-avoidance goals were negatively related to eating disorders, whereas both performance-approach and mastery-avoidance goals positively predicted these disorders. These findings indicate that performance-approach and mastery-avoidance goals may be risk factors for the development of eating disorders, whereas performance-avoidance goals may have protective effects.

Effects of Achievement Goals on Female Aesthetic Athletes' Disordered Eating  
Attitudes

Effets des Buts d'Accomplissement sur les Désordres Alimentaires des Athlètes  
Féminines en Sports Esthétiques

Stéphanie Scoffier, Karine Corrion, & Fabienne d'Arripe-Longueville  
Université de Nice Sophia Antipolis, LAMHESS, EA 6309, 06205 Nice,  
France; Université de Toulon, LAMHESS, EA 6309, 83957 La Garde, France

Correspondent author:

Stéphanie Scoffier

UFR STAPS – Université de Nice Sophia-Antipolis

261 Route de Grenoble, BP 3259

06205 Nice cedex 03 – France

Phone: ++ 33 492 296 529

Fax: ++ 33 492 296 537

E-mail: scoffier@unice.fr

Submitted: February 12th, 2013

Running head: ACHIEVEMENT GOALS AND EATING ATTITUDES

1 Effects of Achievement Goals on Female Aesthetic Athletes' Disordered Eating

2 Attitudes

4 Abstract

5 Objective: This study examined how achievement goals are related to athletes' eating  
6 disorders. Method: The sample consisted of 196 female adolescents involved in aesthetic  
7 sports at an elite level. Data were examined through structural equation modeling.  
8 Results: The data showed that performance-avoidance goals were negatively related to eating  
9 disorders, whereas both performance-approach and mastery-avoidance goals positively  
10 predicted these disorders. These findings indicate that performance-approach and mastery-  
11 avoidance goals may be risk factors for the development of eating disorders, whereas  
12 performance-avoidance goals may have protective effects.

15 **Keywords:** achievement motivation; eating disorders; elite sport.

1 Effets des Buts d'Accomplissement sur les Désordres Alimentaires des Athlètes

2 Féminines en Sports Esthétiques

4 Résumé

5 Objectif: Cette étude examine comment les buts d'accomplissement sont reliés aux désordres  
6 alimentaires des athlètes.

7 Méthode: L'échantillon est composé de 196 adolescentes pratiquant un sport esthétique à un  
8 niveau élite. Les données étaient examinées à partir de modélisations d'équations structurales.

9 Résultats: Les données montrent que les buts de performance-évitement étaient négativement  
10 reliés aux désordres alimentaires, alors qu'aussi bien les buts de performance-approche et  
11 maîtrise-évitement prédisaient positivement ces désordres. Ces résultats indiquent que les buts  
12 de performance-approche et maîtrise-évitement peuvent être considérés comme des facteurs  
13 de risque des désordres alimentaires, tandis que les buts de performance-évitement peuvent  
14 avoir un effet protecteur.

17 **Mots clefs:** motivation d'accomplissement; désordres alimentaires; sport d'élite.

*Effects of Approach and Avoidance Goals on Female Aesthetic Athletes' Disordered**Eating Attitudes*

## Introduction

Several factors influence the development of disordered eating attitudes, which can be defined as maladaptive attitudes toward eating and weight control. These attitudes and behaviors range from eating habits to help with weight loss or maintenance to severe or harsh food restriction (Hobart & Smucker, 2000; Petrie & Greenleaf, 2007). Thinness norms can confer a competitive advantage in certain sports and, unsurprisingly, participation in these sports carries a high risk of developing an eating disorder (Petrie & Greenleaf, 2007). Indeed, sports judged on aesthetic criteria emphasize the appearance of athletes' bodies and/or require a specific morphology (e.g., figure skating, gymnastics) (Beals & Manore, 2000; Smolak, Murnen, & Ruble, 2000; Sherman & Thompson, 2009; Sundgot-Borgen & Torstveit, 2004). Some athletes in aesthetic sports thus often struggle to conform to an ideal body weight in order to present an aesthetically pleasing appearance, whereas others may struggle to maintain low body weight or stay within a specific weight category in order to optimize performance. Maintenance of a specific body weight is essential in all such sports (Sherman & Thompson, 2009), and this pressure is added to the already high pressure to achieve excellence and win. Moreover, sports that require the public display of physical grace and skill are typical achievement contexts that favor eating disorders (Scoffier, Maïano, & d'Arripe-Longueville, 2010), and achievement goal theories might therefore provide insight into the disordered eating of female aesthetic athletes.

The literature in social psychology and sport psychology indicates that disordered eating attitudes develop from a complex interaction of personal and contextual factors (e.g., Jacobi, Hayward, De Zwaan, Kraemer, & Agras, 2004; Petrie & Greenleaf, 2007). Many psychosocial factors of disordered eating attitudes have been examined, such as

1 perfectionism, anxiety, self-esteem, body image, and coaching style. However, the effects of  
2 achievement goals on disturbed eating attitudes have been little explored and no study has  
3 examined the effects within the 2x2 achievement goal framework (Elliott & McGregor,  
4 2001).

5 In the social psychology literature, achievement motives have been examined according  
6 to several conceptualizations. Initially, the achievement model (Ames & Ames, 1984; Dweck  
7 & Legett, 1988; Nicholls, 1984) was based on a bi-dimensional approach to goal-oriented  
8 behavior (mastery *vs.* performance). Performance goals seek to demonstrate ability to others.  
9 Mastery goals, on the other hand, seek to improve and learn, no matter how awkward you  
10 might look to others. Two goals were considered to be particularly important in these  
11 situations, each reflecting a distinct way of subjectively defining success or failure and  
12 judging ability. Then, Elliot and his collaborators (Elliot & Church, 1997; Elliot &  
13 Harackiewicz, 1996) proposed a tri-dimensional approach to achievement goals in which a  
14 distinction between performance-approach and performance-avoidance was operational.  
15 Performance-oriented goals were interpreted as representing the valence of competence (i.e.,  
16 positive and negative valences, respectively).

17 More recently, several authors (e.g., Cury, Elliot, Da Fonséca, & Moller, 2006; Elliot &  
18 McGregor, 2001) have proposed a further conceptual modification to achievement goal theory  
19 by distinguishing between approach and avoidance goals for both mastery and performance;  
20 this was termed the 2x2 model (Elliot & McGregor, 2001). This model thus takes into account  
21 four situational goals: (a) mastery-approach, in which individuals define competence in  
22 reference to either themselves or absolute standards and attribute positive or negative valence  
23 to it; (b) mastery-avoidance, in which individuals define competence in reference to  
24 themselves and attribute positive or negative valence to it. In this case, the goal is to avoid  
25 regressing or not mastering every part of the task; (c) performance-approach, in which

1 individuals define competence normatively and attribute positive valence to it; and (d)  
2 performance-avoidance, in which individuals define competence normatively and attribute  
3 negative valence to it. In this case, the goal is to avoid demonstrating incompetence compared  
4 with others (for a review, see Elliot, 1999, 2005).

5 The research based on the 2x2 model has shown that the achievement goal framework is  
6 useful for predicting and explaining a wide range of variables associated with achievement,  
7 such as intrinsic motivation, perceived competence, and implicit theories (for a review, see  
8 Cury et al., 2006; Elliot & Friedman, 2007; Elliot & McGregor, 2001; Harackiewicz Barron,  
9 Pintrich, Elliot, & Thrash, 2002). From a functional point of view, both goal valences (i.e.,  
10 approach and avoidance) are necessary for successful adaptation (Tamir & Diener, 2008).  
11 Indeed, whereas approach goals facilitate growth and flourishing, avoidance goals facilitate  
12 protection and survival (Tamir & Diener, 2008). Approach and avoidance goals promote  
13 distinct types of affective, cognitive, and behavioral processes, and both are relevant to  
14 adaptive functioning. Overall, the process of pursuing approach goals is different from the  
15 process of pursuing avoidance goals. Approach goals appear to be easier to monitor and more  
16 manageable than avoidance goals. In addition, whereas approach goals elicit positive  
17 cognitions, avoidance goals elicit negative cognitions. According to activity theories,  
18 therefore, the pursuit of approach goals would be more likely to promote well-being than the  
19 pursuit of avoidance goals (Tamir & Diener, 2008).

20 Several studies have examined the effects of the 2x2 achievement goal framework on  
21 a variety of variables. Mastery-approach goals, for example, are related to the use of adaptive  
22 strategies and positive affects (e.g., Elliot & McGregor, 2001) and are generally related to  
23 adaptive achievement patterns. On the other hand, the social psychology literature indicates  
24 that mastery-avoidance goals cannot be categorized into adaptive or maladaptive achievement  
25 patterns (Ciani & Sheldon, in press). Indeed, mastery-avoidance goals are associated with



1 high-perceived competence, effort, and physical activity (Wang, Biddle, & Elliot, 2007), yet  
2 they are also related to maladaptive cognitions such as the fear of losing, worrying,  
3 disorganization and low self-regulation (Elliot & Mc Gregor, 2001), and amotivation (Nien &  
4 Duda, 2008). Performance-approach goals are related to high-perceived competence and the  
5 fear of losing in the sport context (Conroy & Elliot, 2004). Performance-avoidance goals lead  
6 to maladaptive cognitions, affects, and behaviors for learning and achievement (e.g., Elliot,  
7 Cury, Fryer & Huguet, 2006), and low interest in performance. Thus, performance-approach  
8 and performance-avoidance goals constitute maladaptive achievement patterns. But,  
9 avoidance strategies might have protected effects (e.g., Elliot, 2005). Avoidance goals, for  
10 example, help individuals avoid taking unnecessary risks (e.g., Lauriola & Levin, 2001) or  
11 consuming harmful substances (e.g., Worth, Sullivan, Hertel, Rothman, & Jeffery, 2005).

12         Although several studies have applied the 2x2 model to the variables associated with  
13 achievement in academic and athletic contexts, these constructs have not been much  
14 examined in relation to health variables. A few studies have been conducted with the bi-  
15 dimensional approach to achievement goals (Nicholls, 1984). Duda and colleagues showed  
16 that an environment that encouraged mastery seemed to protect female gymnasts from  
17 disordered eating attitudes, whereas the perception of a performance-oriented climate seemed  
18 to have a negative impact on the body image of these athletes and their weight concerns and  
19 predisposed them to disordered eating attitudes and low self-esteem (Duda, 2001; Duda &  
20 Bernadot, 1997; Duda & Kim, 1997). In addition, the study of Chi (2004) showed that  
21 performance goals could lead to destructive behaviors like drug abuse, alcoholism, or extreme  
22 weight control.

23         De Bruin, Bakker and Oudejans (2008) reported partial correlations suggesting that  
24 strong ego orientation was associated with more dieting behavior, greater tendency toward  
25 perfectionism, greater vulnerability to peer pressure about weight, and lower self-esteem. In

1 contrast, the perception of a mastery-oriented climate was correlated with less dieting  
2 behavior and less vulnerability to pressure about weight from peers and coach. Most  
3 importantly, regression analysis showed that after controlling for body mass index, both ego  
4 orientation and mastery climate made a unique significant contribution to explaining dieting  
5 variance. Maugendre, Spitz, and Lanfranchi (2009) also showed that extrinsic motivation,  
6 amotivation and goals influence the development of eating disorders in young girls practicing  
7 a sport intensively (more than 8 hours per week).

8       Recently, Scoffier, Gernigon and d'Arripe-Longueville (2011) applied the 2x2  
9 achievement goal model in a study of figure skaters. They showed that induced mastery-  
10 approach goals and performance-avoidance goals were associated with a greater capacity for  
11 self-regulation of eating attitudes than induced performance-approach goals and mastery-  
12 avoidance goals. The relationships were the same at both self-reported and behavioral levels,  
13 except for the performance-approach goals, which were not significantly related to the self-  
14 reported measure of the self-regulation of eating attitudes. This study confirmed the interest in  
15 distinguishing between the approach and avoidance valences of achievement goals. As the  
16 sample was relatively small, however, and included only figure skaters, a next step would be  
17 to study a larger sample with athletes from different aesthetic sports.

18       The present study thus aimed to examine the concomitant relationships between the four  
19 achievement goals defined in the 2x2 model and disordered eating attitudes. We expected that  
20 achievement goals would be related to disordered eating attitudes in diversified ways  
21 (Scoffier et al., 2011), but that these differences would be the same across aesthetic sports.  
22 We assumed that mastery-approach goals would protect against disordered eating attitudes  
23 (Duda, 2001), as this type of goal is usually associated with adaptive patterns (Elliott &  
24 McGregor, 2001; Warburton & Spray, 2008). On the other hand, we expected that  
25 performance-approach goals would predispose to disordered eating attitudes (Chi, 2004; De

1 Bruin et al., 2009; Duda, 2001). Performance-avoidance goals are usually associated with  
2 maladaptive patterns of accomplishment like low perceived competence, low self-  
3 determination, strong entity theory (Elliot & McGregor, 2001), and low intrinsic motivation  
4 (Cury et al., 2006), and we thus hypothesized that this situational goal would favor the  
5 appearance of disordered eating attitudes. Elliot and McGregor (2001) associated mastery-  
6 avoidance goals with the fear of losing, worrying, disorganization and low self-regulation,  
7 while Wang, Biddle and Elliot (2007) associated mastery-avoidance goals with high-  
8 perceived competence, effort, and physical activity. We thus assumed that mastery-avoidance  
9 goals would be vectors of adaptive or maladaptive patterns and would either predispose or not  
10 to disordered eating attitudes; this relationship was therefore examined in an exploratory way.

## 11 Method

### 12 *Participants and Procedure*

13 The sample was composed of 196 French voluntary high-level female athletes. The ages  
14 ranged from 13 to 20 years ( $M_{age} = 17.06$ ;  $SD = 4.41$ ) and all participants practiced  
15 gymnastics ( $N_g = 131$ ) or figure skating ( $N_s = 65$ ) intensively ( $M = 8.65$  hours per week,  $SD$   
16  $= 5.55$ ), with a minimum of five years of experience in national or international competition  
17 ( $M = 8.75$ ;  $SD = 2.40$ ). The ethical committee of the University of Nice Sophia-Antipolis  
18 approved the study and we obtained written informed consent from participants and their  
19 parents for minors. The questionnaires were completed either at the beginning or the end of  
20 training sessions, depending on the athlete's availability. Questionnaire completion was  
21 carried out under standardized conditions (i.e., isolation, paper, pencil, and prohibition to  
22 communicate) and did not exceed 20 minutes.

### 23 *2.2. Measures*

24 *Achievement goals.* A validated French version (Schiano-Lomoriello, Cury, & Da  
25 Fonséca, 2005) of Elliot and McGregor's (2001) *Achievement Goals Questionnaire* was used

1 to assess the four goals in the 2x2 model. Three items assess each goal (mastery-approach:  
 2 e.g., “This term, I want to learn as much as possible in my sport”; performance-approach: e.g.,  
 3 “This term, it is important for me to do better than other athletes”; mastery-avoidance: e.g.,  
 4 “My goal this term is to avoid learning less than I possibly could in my sport”; and  
 5 performance-avoidance: e.g., “My goal this term is to avoid performing worse than other  
 6 athletes”). This questionnaire is actually used for adolescents and adults in studies.  
 7 Participants responded on a Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*).  
 8 Each subscale exhibited satisfactory internal consistency based on the study sample  
 9 (respectively, .74, .78, .82, and .83).

10 *Disturbed eating attitudes.* Eating attitudes and behaviors were assessed with the French  
 11 version of the Garner, Olmsted, Bohr and Garfinkel (1982) *Eating Attitudes Test* (Leichner,  
 12 Steiger, Puentes-Neuman, Perreault, & Gottheil, 1994). This 26-item self-report inventory  
 13 comprises three subscales: dieting, bulimia and oral control (e.g., “The desire to be thinner  
 14 worries me”; “I cut up my food in small pieces”; “I vomit after eating”) and is actually used  
 15 for adolescents and adults in studies. Participants responded to items on a 6-point Likert-type  
 16 scale ranging from 1 (*always*) to 6 (*never*). As the participant did not present clinical eating  
 17 disorders and consistent with previous studies (Scoffier et al., 2009), only a global index  
 18 measuring disturbed attitudes was used. For the analyses, the scores of this questionnaire were  
 19 reversed. Thus, the higher the score was, the higher the disordered eating attitudes were. This  
 20 global scale exhibited satisfactory internal consistency based on the study sample ( $\rho = .86$ ).

### 21 2.3. Data Analyses

22 This study tested a model for examining the relationship between achievement goals and  
 23 disordered eating attitudes. Multivariate analyses of variance (MANOVAs) were performed  
 24 on all variables to detect differences due to sport type. Analyses were performed using  
 25 bootstrapped maximum likelihood estimation with the AMOS 7.0 software (Arbuckle, 2006)

1 because of the significant multivariate non-normality of the data (normalized skewness:  
 2 114.35; normalized kurtosis: 28.33). Assessment of model fit was based on multiple  
 3 indicators recommended by the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI)  
 4 (Byrne, 2005; Hu & Bentler, 1998), and Vandenberg and Lance (2000): chi-square ( $\chi^2$ ), the  
 5 Root Mean Square Error of Approximation (RMSEA), and the RMSEA 90 Confidence  
 6 Interval (RMSEA 90% CI). Scale reliability ( $\rho$ ) was computed from the model's standardized  
 7 parameter estimates, using the formula:  $\rho = (\sum \lambda_i)^2 / ([\sum \lambda_i]^2 + \sum \delta_{ii})$ , where  $\lambda_i$  are the factor  
 8 loadings and  $\delta_{ii}$  the error variances (Bagozzi & Kimmel, 1995).

9 The hypothetical model of the influence of the four achievement goals on disordered  
 10 eating attitudes was examined through structural equation modeling (SEM). Last, the  
 11 individual parameters of the model, such as error measurement, inter-item correlations, and  
 12 modifications index, were examined to evaluate the conformity of the model to the data.

## 13 Results

### 14 *Preliminary Analyses*

15 The results of the descriptive statistical analyses are presented in Table 1. The  
 16 correlation matrix (Pearson's  $r$ ) (Table 1) highlighted the positive relationships between: (a)  
 17 performance-avoidance and performance-approach, (b) performance-avoidance and mastery-  
 18 avoidance, (c) mastery-avoidance and disordered eating attitudes, and (d) performance-  
 19 approach and disordered eating attitudes.

20 Multivariate analyses of variance (MANOVAs) were performed on all observed  
 21 variables to examine the differences due to adolescent sport type (gymnastics vs. figure  
 22 skating). The analysis of the variables revealed no significant effect of sport type (Wilks  $\lambda =$   
 23  $.98$ ,  $F_{(5, 188)} = .303$ ,  $p = .95$ ,  $\eta^2 = .70$ ), indicating that the sample was homogeneous.

### 24 *Effect of Achievement Goals on Disordered Eating Attitudes*

1           The relationships between variables were examined in a SEM according to the  
 2 hypothetical model. The SEM provided acceptable goodness-of-fit indices ( $\chi^2$  (196, 80) =  
 3 210.93; CFI = .95; TLI = .94; RMSEA = .053; IC RMSEA = .034/.071). The model (Figure  
 4 1) exhibited the negative influences of performance-avoidance on disordered eating attitudes  
 5 ( $\beta = -.51, p < .05$ ). We also observed a positive influence of performance-approach and  
 6 mastery-avoidance on the disordered eating attitudes ( $\beta = .52, p < .05$ ;  $\beta = .45, p < .05$   
 7 respectively). This SEM explained 53% of the variance of the disordered eating attitudes. All  
 8 the subscales exhibited good internal consistency (Bagozzi & Kimmel, 1995; Table 1).

## 9 Discussion

10           This study examined the influence of the four achievement goals defined in the 2x2  
 11 model on disordered eating attitudes in a large sample of athletes from different aesthetic  
 12 sports. First, our results showed that, in line with our expectations, performance-approach  
 13 goals were positive predictors of emerging disordered eating attitudes. This finding agreed  
 14 with those of Chi (2004) and De Bruin et al. (2009), who showed that performance goals were  
 15 associated with maladaptive patterns of achievement and could lead to destructive behaviors  
 16 like drug abuse, alcoholism, or excessive weight control. Mastery-avoidance goals were also  
 17 positive predictors of disordered eating attitudes. Elliot and McGregor (2001) associated  
 18 mastery-avoidance with the fear of losing, worry, disorganization and diminished self-  
 19 regulation. These relationships illustrate the maladaptive patterns linked to mastery-avoidance  
 20 and reinforce the results observed in the present study between mastery-avoidance and  
 21 disordered eating attitudes. These two types of goal thus appear to be situational context that  
 22 are propitious for developing eating disorders.

23           In accordance with Scoffier et al. (2011), but contrary to our expectations, performance-  
 24 avoidance was a protective factor. As noted earlier, athletes characterized by high  
 25 performance-avoidance goals might have a relatively low perception of their physical

1 abilities. From this perspective, they would be unwilling to go to any lengths to achieve  
2 maximal performance and would thus avoid deviant behaviors like disordered eating (Cury,  
3 Da Fonseca, Rufo, & Sarrazin, 2002; Scoffier et al., 2009). However, more research is needed  
4 to support this supposition. A relationship between mastery-approach and disturbed eating  
5 attitudes did not emerge in the structural equation model or the correlation table. This result  
6 differs from previous studies in the sport psychology literature (De Bruin et al., 2009). The  
7 lack of relationship between these variables could be linked to the competitive period for the  
8 participant. Last, our results showed that the distinction between the approach and avoidance  
9 valences (Elliot & McGregor, 2001) is particularly relevant for explaining athletes' disturbed  
10 eating attitudes in terms of performance goals. The role of this distinction in mastery goals  
11 merits further exploration in future research.

12       To better understand the processes or mechanisms by which achievement goals  
13 influence disordered eating attitudes, the variables that may mediate or moderate this  
14 relationship should be investigated. One candidate, for example, would be intrinsic  
15 motivation, which is positively related to mastery goals and negatively related to performance  
16 goals (Grant & Dweck, 2003). It has also been shown that perceived competence moderates  
17 the effect of ego orientation in the motivational process, suggesting the hypothesis that ego-  
18 oriented subjects who show low perceived competence will manifest a positive relationship  
19 with eating disorders, whereas those individuals with high perceived competence will show a  
20 negative relationship. Perfectionism is another potential mediator. Perfectionist tendencies  
21 can be considered as part of a mode of motivational and achievement-oriented striving (Duda  
22 & Hall, 2001). Previous studies have found task goals to be related to adaptive aspects of  
23 perfectionism, whereas ego goals have been found to be associated with maladaptive  
24 perfectionist tendencies (i.e., Dunn, Dunn, & Syrotuik, 2002). Other studies have shown that  
25 eating disorders are more developed in subjects characterized by self-oriented perfectionism

1 and low satisfaction with body weight (Filaire, Rouveix, Bouget, & Pannafieux, 2007).

2 To conclude, our results indicated that the 2x2 model of achievement goals applies to  
3 disordered eating attitudes in the aesthetic sport context. Mastery-avoidance and performance-  
4 approach goals seem to be “risk factors” for the development of eating disorders, and  
5 mastery-approach and performance-avoidance goals seem to be protective factors. The results  
6 of this study confirmed that the 2x2 achievement goal model can be fruitfully applied to gain  
7 insight into the development of eating disorders, as observed in the experiment of Scoffier et  
8 al. (2011). We thus can generalize the results observed in our original sample of figure skaters  
9 to a broader sample of aesthetic sport athletes.

10 This study has several limitations. First, the data concerning the key variables were self-  
11 reported, suggesting the likelihood that social desirability was operative. Second, the study  
12 was cross-sectional in nature; therefore conclusions about causality cannot be inferred. There  
13 was just one time of measure and one context. Third, the athletes’ scores on the eating  
14 psychopathology measure indicated relatively healthy attitudes; it is therefore unclear whether  
15 the relationships observed in this study would extend to athletes with more severe eating  
16 disorders. Moreover, as a control group of non-athletes was not included, it is also unclear  
17 whether these relationships would extend to the general population. The generalization of the  
18 results is also limited to the female gender and an elite level of practice. Last, the participants’  
19 ages and competition experience were not controlled and future research on eating attitudes  
20 will thus need to take into account these individual differences.

## 21 Perspectives

22 Our results nevertheless suggest some research perspectives. First, future studies might  
23 investigate whether the relationships we obtained can be generalized to athletes in other types  
24 of sport or to other types of population, as well as the aforementioned variables that could  
25 play a moderation or mediation role in this relationship. Thus, future studies could replicate



1 the present study with a sample of non-athletic controls, as well as a clinical sample, in order  
2 to determine whether the mechanisms involved in the eating psychopathology of athletes are  
3 also operative in the general population and patients with eating disorders. Second, the  
4 contextual and temporal dimensions could be considered, with future studies examining the  
5 current eating behavior, with a temporal control especially concerning the current goals.  
6 Moreover, a longitudinal study would provide even stronger evidence of the relationships  
7 between variables and should thus also be considered.

8       If our findings are confirmed, programs to prevent disordered eating attitudes in athletes  
9 could be specifically designed to provide appropriate and healthier contexts for goal  
10 involvement. For example, programs could be adapted to encourage an orientation toward  
11 task mastery as a means to protect from disordered eating attitudes, whereas programs  
12 encouraging a performance-oriented climate would be abandoned because of their negative  
13 impact on body image and weight concerns, which predisposes athletes to disordered eating  
14 and low self-esteem (Duda, 2001; Duda & Bernadot, 1997; Duda & Kim, 1997). Not least,  
15 corresponding improvements could be made in the management training programs for sports  
16 federations and the approaches to athletes' mental preparation and health maintenance.

17

## 18 References

- 19 Ames, R., & Ames, C. (1984). *Research on motivation in education: Student motivation*. New  
20 York: Academic Press, pp. 177-207.
- 21 Arbuckle, J. (2006). *AMOS 7.0 User's Guide*. Chicago, IL: SPSS.
- 22 Bagozzi, R. P., & Kimmel, S. K. (1995). A comparison of leading theories for the prediction  
23 of goal directed behaviors. *British Journal of Social Psychology*, 34, 437-461.

- 1 Beals, K. A., & Manore, M. M. (2000). Behavioral, psychological and physical characteristics  
2 of female athletes with subclinical disordered eating attitudes. *International Journal of*  
3 *Sport Nutrition and Exercise Metabolism*, 10, 128-143.
- 4 Byrne, B. (2005). Factor analytic models: Viewing the structure of an assessment instrument  
5 from three perspectives. *Journal of Personality Assessment*, 85, 17-32.
- 6 Chi, L. (2004). Achievement goal theory. In T. Morris, & J. Summers, (Eds.) *Sport*  
7 *psychology: Theory, applications and issues* (2<sup>nd</sup> ed.). Australia: John Wiley & Son, pp.  
8 152-174.
- 9 Ciani, K. D., & Sheldon, K. M. (2011). Evaluating the mastery-avoidance goal construct: A  
10 study of elite college baseball players. *Psychology of Sport and Exercise*, 1, 223-243.
- 11 Conroy, D. E., & Elliot, A. J. (2004). Fear of failure and achievement goals in sport:  
12 Addressing the issue of the chicken and the egg. *Anxiety, Stress & Coping*, 17, 271-285.
- 13 Cury, F., Da Fonséca, D., Rufo, M., & Sarrazin, P. (2002). Perceptions of competence,  
14 implicit theory of ability, perception of motivational climate, and achievement goals: A  
15 test of the trichotomous conceptualization of the endorsement of achievement motivation  
16 in the physical education setting. *Perception of Motor Skills*, 95, 233-244.
- 17 Cury, F., Elliot, A. J., Da Fonséca, D., & Moller, A. C. (2006). The social-cognitive model of  
18 achievement motivation and the 2 x 2 achievement goal framework. *Journal of*  
19 *Personality and Social Psychology*, 90, 666-679.
- 20 De Bruin, K., Bakker, F. C., & Oudejans, R. D. (2009). Achievement goal theory and  
21 disordered eating attitudes: Relationships of disordered eating attitudes with goal  
22 orientations and motivational climate in female gymnasts and dancers. *Psychology of*  
23 *Sport and Exercise*, 10, 172-79.
- 24 Duda, J. L., (2001). La théorie des buts d'accomplissement et la santé dans le domaine  
25 physique [Achievement goal theory and health in the physical domain]. In F. Cury, & P.

- 1 Sarrazin, (Eds.), *Théories de la motivation et pratiques sportives : état des recherches*  
2 (pp. 255-276). Paris : PUF.  
3  
4 3 Duda, J. L., & Bernardot, D. (2001). Group influences on eating and dieting behaviors in male  
5 and female varsity athletes. In H. A. Hausenblas, & A. V. Carron (Eds.), *Journal of*  
6  
7 4 *Sport Behavior*, 23, 33-41.  
8  
9 5  
10  
11 6 Duda, J. L., & Hall, H. (2001). Achievement goal theory in sport: Recent extensions and  
12 future directions. In R. N. Singer, H. A. Hausenblas, & C. M. Janelle (Eds.), *Handbook*  
13  
14 7 *of sport psychology* (pp. 417 – 443). New York: Wiley.  
15  
16 8  
17 9 Duda, J. L., & Kim, M. (1997). Perceptions of the motivational climate, psychological  
18 characteristics, and attitudes toward eating among young female gymnasts. *Journal of*  
19  
20 10 *Sport and Exercise Psychology*, 19, S48, (NASPSPA abstracts).  
21  
22 11  
23 12 Dunn, J. G. H., & Syrotuik, D. G. (2003). Perfectionism and anger in Canadian football.  
24  
25 13 Communication to the XIth European Congress of Sport Psychology, Copenhagen.  
26  
27 14 Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and  
28  
29 15 personality. *Psychological Review*, 95, 256-273.  
30  
31 16 Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational*  
32  
33 17 *Psychologist*, 34, 169-189.  
34  
35 18 Elliot, A. J. (2005). A conceptual history of the achievement goal construct. In A. Elliot & C.  
36  
37 19 Dweck (Eds.), *Handbook of competence and motivation* (pp. 52-72). NY: Guilford  
38  
39 20 Press.  
40  
41 21 Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance  
42  
43 22 achievement motivation. *Journal of Personality and Social Psychology*, 72, 218-232.  
44  
45 23 Elliot, A. J., & Friedman, R. (2007). Approach-avoidance: A central characteristic of personal  
46  
47 24 goals. In B. R. Little, K. Salmela-Aro, & S. D. Phillips (Eds.), *Personal Project Pursuit*  
48  
49 25 (pp. 97-118). Mahwah, NJ: Lawrence Erlbaum Associates.  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

- 1 Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and  
2 intrinsic motivation: A mediation analysis. *Journal of Personality and Social*  
3 *Psychology, 70*, 968-980.
- 4 Elliot, A., & McGregor, H. (2001). A 2x2 achievement goal framework. *Journal of*  
5 *Personality and Social Psychology, 80*, 501-519.
- 6 Elliot, A., Cury, F., Fryer, J., & Huguet, P. (2006). Achievement goals, self-handicapping, and  
7 performance attainment: A mediational analysis. *Journal of Sport and Exercise*  
8 *Psychology, 28*, 344-361.
- 9 Filaire, E., Rouveix, M., Bouget, M., & Pannafieux, C. (2007). Prévalence des troubles du  
10 comportement alimentaire chez le sportif. *Science & Sports, 22*, 135-42.
- 11 Garner, D., Olmsted, M., Bohr, Y., & Garfinkel, P. (1982). The Eating Attitude Test:  
12 psychometric features and clinical correlates. *Psychological Medicine, 12*, 871-878.
- 13 Grant, H. & Dweck, C.S. (2003). Clarifying achievement goals and their impact. *Journal of*  
14 *Personality and Social Psychology, 85*, 541-553.
- 15 Harackiewicz, J. M., Barron, K., Pintrich, P. R., Elliot, A. J., & Thrash, T. M. (2002).  
16 Revision of achievement goal theory. *Journal of Educational Psychology, 94*, 638-645.
- 17 Hobart, J. A., & Smucker, D. R. (2000). The female athlete triad. *American Family Physician,*  
18 *61*, 3357-3367.
- 19 Hu, L. T., & Bentler, P. M. (1998). Fit Indices in covariance structure modeling: sensitivity to  
20 underparametrized model misspecification. *Psychological Methods, 3*, 424-453.
- 21 Jacobi, C., Hayward, C., de Zwaan, M., Kraemer H. C., & Agras, S. (2004). Coming to terms  
22 with risk factors for eating disorders: application of risk terminology and suggestions for  
23 a general taxonomy. *Psychological Bulletin, 13*, 19-65.

- 1 Lauriolan M., & Levin, I. P. (2001). Personality traits and risky decision-making in a  
2 controlled experimental task: An exploratory study. *Personality and Individual*  
3 *Differences, 31*, 215-226.
- 4 Leichner, P., Steiger, H., Puentes-Neuman, G., Perreault, M., & Gottheil, N. (1994).  
5 Validation d'une échelle d'attitudes alimentaires auprès d'une population québécoise  
6 francophone. *Revue Canadienne de Psychiatrie, 39*, 49-54.
- 7 Maugendre, M., Spitz, E., & Lanfranchi, J. B. (2009). Étude longitudinale des effets de la  
8 motivation sportive sur les troubles des conduites alimentaires chez les adolescents.  
9 *Evolution Psychiatrique, 74*, 430 - 444.
- 10 Nicholls, J. (1989). The competitive ethos and democratic education. Cambridge, MA:  
11 Harvard University Press.
- 12 Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective  
13 experience, task choice, and performance. *Psychological Review, 91*, 328-346.
- 14 Nien, C., & Duda, J. L. (2008). Antecedents and consequences of approach and avoidance  
15 achievement goals: A test of gender invariance. *Psychology of Sport & Exercise, 9*, 352-  
16 372.
- 17 Parish, L. E., & Treasure, D. C. (2003). Physical activity and situational motivation in  
18 physical education: Influence of the motivational climate and perceived ability.  
19 *American Alliance for Health, Physical Education, Recreation and Dance, 72*, 173-182.
- 20 Petrie, T. A., & Greenleaf, C. A. (2007). Eating disorders in sport: From theory to research to  
21 intervention. In G. Tenenbaum (Ed.), *The Handbook of Sport Psychology* (3rd ed.) (pp.  
22 352-378). New York: John Wiley.
- 23 Schiano-Lomoriello, S., Cury, F., & Da Fonséca, D. (2005). Développement et validation du  
24 questionnaire d'approche et d'évitement en éducation physique et sportive (QAE-EPS)

- 1 [Development and validation of the approach and avoidance questionnaire for sport and  
2 physical education setting]. *Revue Européenne de Psychologie Appliquée*, 55, 85-98.
- 3 Scoffier, S., Gernigon, C., & Arripe-Longueville, F. (d') (2011). Effects Of Achievement  
4 Goals On Self-Regulation Of Eating Attitudes Among Elite Female Athletes: An  
5 Experimental Study. *Psychology of Sport and Exercise*, 13, 201-207.
- 6 Scoffier, S., Maïano, C., & Arripe-Longueville, F. (d') (2009). Factor validity and reliability  
7 of the sport friendship quality scale in a French adolescent sample. *International  
8 Journal of Sport Psychology*, 40, 324-350.
- 9 Sherman, R. T., & Thompson, R. A. (2009). Body image and eating disturbance in athletes:  
10 Competing to win or to be thin? In J. J. Reels, & K. A. Beals, (Ed). *The Hidden Faces  
11 of Eating Disorders and Body Image* (pp. 9-38) Reston, VA: AAHPERD.
- 12 Smolak, L., Murnen, S. K., & Ruble, A. E. (2000). Female athletes and eating problems: A  
13 meta-analysis. *International Journal of Eating Disorders*, 27, 371-380.
- 14 Sundgot-Borgen J, Torstveit MK. Prevalence of eating disorders in elite athletes is higher  
15 than in the general population. *Clinical J Sport Med*, 2004; 14: 25-32.
- 16 Tamir, M., & Diener, E. (2008). Approach-avoidance goals and well-being: One size does not  
17 fit all. In A. J. Elliot, (Ed.), *Handbook of approach and avoidance motivation*. Mahwah,  
18 NJ: Lawrence Erlbaum Associates.
- 19 Vandenberg, R. J. & Lance, C. E. (2000). A review and synthesis of the measurement  
20 invariance literature: Suggestions, practices, and recommendations for organizational  
21 research. *Organizational Research Methods*, 3, 4-69.
- 22 Wang, C. K. J., Biddle, S. J. H., & Elliot, A. (2007). The 2x2 achievement goal framework in a  
23 physical education context. *Psychology of Sport and Exercise*, 8, 147-168.

1 Warburton, V., & Spray, C. (2008). Motivation in physical education across the primary-  
2 secondary school transition Warburton and Spray. *European Physical Education*  
3 *Review, 14*, 157-178.

4 Worth, K. A., Sullivan, H. W., Hertel, A. W., Rothman, A. J., & Jeffery, R. W. (2005).  
5 Avoidance goals can be beneficial: A look at smoking cessation. *Basic and Applied*  
6 *Social Psychology, 27*, 107-116.

7

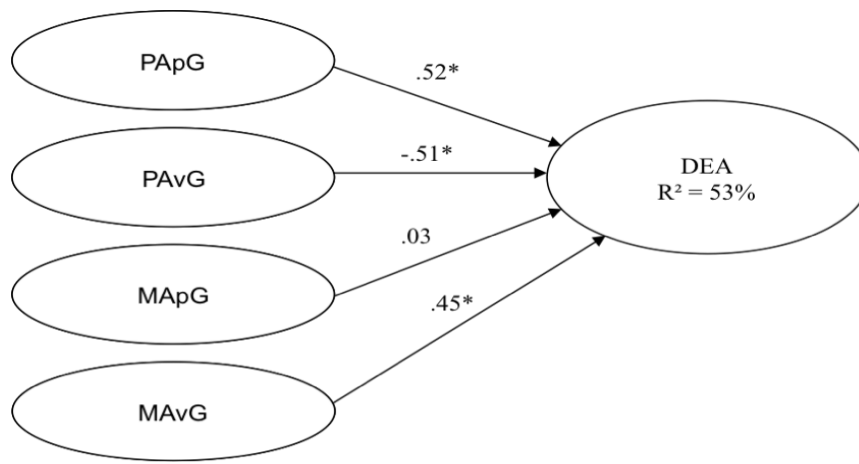
**Table 1.** Descriptive Statistics and Internal Consistency Coefficients of the Studied Variables and the Correlation Matrix  $r$  of Pearson ( $N = 196$ ).

	M	SD	$\rho$	MApG	PAPG	MAvG	PAvG	DEA
Mastery-approach goal	6.23	1.06	.74	–				
Performance-approach goal	4.86	1.71	.78	.13	–			
Mastery-avoidance goal	4.95	1.73	.82	-.05	.06	–		
Performance-avoidance goal	4.56	1.70	.83	.01	.45*	.44*	–	
Disordered eating attitudes	2.25	.67	.86	.10	.52*	.55*	-.53*	–

*Notes:* *M*: mean; *SD*: standard deviation;  $\rho$ : internal consistency coefficient; MApG: Mastery-Approach Goal; PAPG: Performance-Approach Goal; MAvG: Mastery-Avoidance Goal; PAvG: Performance-Avoidance Goal; DEA: Disordered Eating Attitudes. \*:  $p < .05$ .



Figure



**Figure 1.** Structural equation modeling of the achievement goals that explained disordered eating attitudes in elite female athletes.

Notes. MApG: Mastery-Approach Goal; PAPG: Performance-Approach Goal; MAvG: Mastery-Avoidance Goal; PAVG: Performance-Avoidance Goal; DEA: Disordered Eating Attitudes; R<sup>2</sup>: percentage of explained variance; \*: significant standardized estimate coefficients at  $p < .05$ .

1 Acknowledgments

2 This study was financially supported by a grant from the University of Nice Sophia-Antipolis  
3 and the France Foundation. The authors are grateful to the athletes for their participation.  
4 They also sincerely thank Catherine Carmenì for her help in the English translation.

7 Conflict of Interest Statement

8 We certify that there is no conflict of interest with any financial organization regarding the  
9 material discussed in the manuscript.

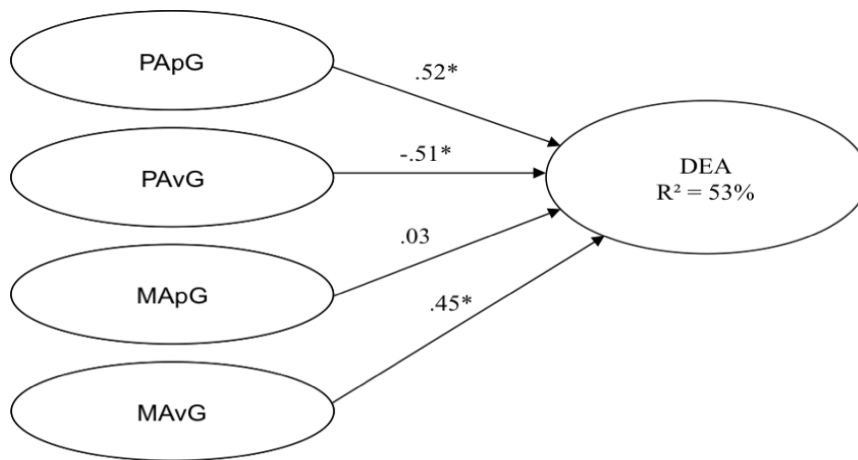
10

**Table 1.** Descriptive Statistics and Internal Consistency Coefficients of the Studied Variables and the Correlation Matrix  $r$  of Pearson ( $N = 196$ ).

	M	SD	$\rho$	MApG	PAPG	MAvG	PAvG	DEA
Mastery-approach goal	6.23	1.06	.74	–				
Performance-approach goal	4.86	1.71	.78	.13	–			
Mastery-avoidance goal	4.95	1.73	.82	-.05	.06	–		
Performance-avoidance goal	4.56	1.70	.83	.01	.45*	.44*	–	
Disordered eating attitudes	2.25	.67	.86	.10	.52*	.55*	-.53*	–

*Notes:* *M*: mean; *SD*: standard deviation;  $\rho$ : internal consistency coefficient; MApG: Mastery-Approach Goal; PAPG: Performance-Approach Goal; MAvG: Mastery-Avoidance Goal; PAvG: Performance-Avoidance Goal; DEA: Disordered Eating Attitudes. \*:  $p < .05$ .

Figure



**Figure 1.** Structural equation modeling of the achievement goals that explained disordered eating attitudes in elite female athletes.

*Notes.* MApG: Mastery-Approach Goal; PApG: Performance-Approach Goal; MAvG: Mastery-Avoidance Goal; PAvG: Performance-Avoidance Goal; DEA: Disordered Eating Attitudes; R<sup>2</sup>: percentage of explained variance; \*: significant standardized estimate coefficients at  $p < .05$ .

### Réponse au lecteur :

L'objectif de cet article est d'étudier la relation entre les buts d'accomplissements et les désordres alimentaires chez des adolescentes pratiquant un sport esthétique à un niveau élite.

L'article est bien écrit, la problématique est simple et claire et l'étude est bien menée. C'est une étude de type corrélationnelle classique.

Le ou les auteurs montre(nt) ainsi que les buts de performance-évitement sont liés négativement aux désordres alimentaires alors que les buts de performance-approche et maîtrise-évitement prédisent les désordres alimentaires.

Ces résultats sont relativement conformes à la littérature.

L'ensemble du travail est correct en vue d'une publication dans la revue.

Cependant, une critique peut être faite à ce travail et peut faire l'objet d'une amélioration dans la discussion :

L'étude corrélationnelle simple ne met pas en évidence les processus par lequel les buts d'accomplissement influencent les désordres alimentaires et comment le contexte (période d'entraînement, compétition.) pourrait également avoir une influence. Ce dernier point est d'ailleurs mentionné dans les perspectives.

Nous aurions ainsi aimé avoir davantage d'informations sur les processus éventuels par lesquels les buts motivationnels agissent sur les désordres alimentaires en discussion et perspective.

Mis à part, ce côté « descriptif » de l'étude et non explicatif, ce travail est tout à fait correct en vue d'une publication.

➔ Nous remercions le reviewer pour ses commentaires sur notre article. Afin de mieux présenter les processus éventuels par lesquels les buts motivationnels agissent sur les désordres alimentaires en discussion et perspective, nous avons ajouté un paragraphe en page 12 à partir de la ligne 12 du manuscrit proposant des variables ou des mécanismes pouvant expliquer les processus éventuels.

« To better understand the processes or mechanisms by which

achievement goals influence disordered eating attitudes, the variables that may mediate or moderate this relationship should be investigated. One candidate, for example, would be intrinsic motivation, which is positively related to mastery goals and negatively related to performance goals (Grant & Dweck, 2003). It has also been shown that perceived competence moderates the effect of ego orientation in the motivational process, suggesting the hypothesis that ego-oriented subjects who show low perceived competence will manifest a positive relationship with eating disorders, whereas those individuals with high

perceived competence will show a negative relationship. Perfectionism is another potential mediator. Perfectionist tendencies can be considered as part of a mode of motivational and achievement-oriented striving (Duda & Hall, 2001). Previous studies have found task goals to be related to adaptive aspects of perfectionism, whereas ego goals have been found to be associated with maladaptive perfectionist tendencies (i.e., Dunn, Dunn, & Syrotuik, 2002). Other studies have shown that eating disorders are more developed in subjects characterized by self-oriented perfectionism and low satisfaction with body weight (Filaire, Rouveix, Bouget, & Pannafieux, 2007).”