

Anxiety Characteristics of Competitive Windsurfers: Relationships with Age, Gender, and Performance Outcomes

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Sport psychology researchers have devoted minimal attention to competitive windsurfers although this group of athletes represents an ideal population for the study of psychological topics and issues. The purpose of the present investigation was to study anxiety and self-confidence characteristics of windsurfers competing at high levels of competition with particular attention devoted to differences that may be present in relation to gender, age, competitive outcomes, and season-long ranking. Participants in the study were 79 professional and amateur windsurfers competing in events at regional and world championships. Athletes who received a better overall season-long ranking in their event had less somatic anxiety than those with poorer performance outcomes. Athletes who had a top-five season-long ranking had higher self-confidence levels than did their counterparts who did not achieve this ranking. Gender differences were not found for anxiety or self-confidence characteristics. Age was related to cognitive anxiety in that cognitive anxiety was higher among younger participants.

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Since windsurfing was created as a sport in the 1960s it has had millions of adherents and practitioners at recreational to competitive levels (Rosenbaum & Dietz, 2002). Nonetheless, windsurfing has received minimal research attention with respect to the psychological aspects of engagement in the sport. Within sport science research, attention to the sport has come primarily from sport medicine researchers with a focus on injury-related concerns (Dyson, Buchanan, & Hale, 2006; Jablecki & Garner, 2000; Rosenbaum & Dietz, 2002). Few research studies to date have dedicated attention to the psychological aspects of the sport (Leahy, 1997).

Adventure sports

Within sport psychology there has been a general absence of research conducted to date on newer sports, particularly those involving risk or adventure. Adventure and extreme sports differ from more mainstream and traditional sports in that they are more likely to be individual sports that are personally initiated and controlled and which tend to take place outside the confines of a traditional field, court, or gymnasium (Martha, Sanchez, & Goma i Freixanet, 2009). Virtually all adventure or extreme sports (e.g., snowboarding half-pipe, wave jumping, ice climbing) involve a considerable amount of risk and anxiety as a consequence of inherent uncertainty, danger, and environmental characteristics and demands and constitute an interesting and important area of study.

The sport of windsurfing, in particular, has received little systematic research attention with initial studies conducted primarily in Italy. Research conducted by Antonelli, Benzi, Tamorri and Marceca (1986) addressed psychological aspects of windsurfing and included participants in the Italian Windsurfing Tour. Their results indicated that the ability to manage anxiety was an important contributor to windsurfing success.

Anxiety outcomes in risk and adventure sports

Although research has generally been scant within the sport of windsurfing, other studies involving similar sports have been published that can help to inform our understanding of the psychological aspects of involvement in risk-taking and adventure sports. High-risk and adventure sports differ from more traditional sports in many respects and there may be correspondent differences in personality characteristics for participants in these sports in comparison to lower-risk sports (Breivik, 1996; Gomà i Freixanet, 1991; Jack & Ronan, 1997). Gomà i Freixanet (2004), for example, found differences in terms of sensation-seeking goals for participants in high-risk sports in comparison to traditional sports. Previous research by this author found that high-risk sport participants were characterized by extroversion, emotional stability, conformity to social norms and the desire for socially-acceptable emotional experi-

ences. Rossi and Cereatti (1993) found that athletes involved in higher risk sports tend to be attracted to novel and emotionally intense situations and, as suggested by Gould and Tuffey (1996), also to seek high levels of arousal.

Bennett and Kremer (2005) conducted research on sources of stress in elite competitive surfers. The surfers identified their main source of stress as the mental challenges encountered in the sport. These mental challenges included overcoming slumps and poor performances, maintaining confidence, coping with unforeseen hardships, and staying relaxed. In comparison, other sources of stress were identified but less influential. The other sources identified by the athletes included concerns about professional experiences, travel, specific competitions, equipment and judging. These additional sources represent the same types of concerns that are customary causes of anxiety across sports. In their qualitative study of elite international athletes, Hanton, Fletcher and Coughlan (2005) found through interview techniques that athletes identified a wide variety of competitive and organizational stressors that affected their participation. The most frequent types of competitive stress mentioned revolved around performance issues such as preparation, injury-related concerns and the pressure of competition.

Anxiety and stress in sport

One particularly relevant area of study to the sport of windsurfing involves issues related to anxiety and anxiety management which form a major component of the emotional response of many athletes to their sport involvement at the competitive level (Weiss & Gill, 2005), but logically even more so for those sports that involve a certain level of risk or adventure. A relatively recent meta-analysis conducted by Woodman and Hardy (2003) included 48 studies that examined relationships among cognitive anxiety and performance and between self-confidence and performance. Forty of these studies had employed the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Bump, & Smith, 1990). Their results indicated that differences in cognitive anxiety and self-confidence in performers was attributed largely to the increase in perceived pressure that accompanied the performance demands associated with competing at high levels of competition, specifically competition at the national or international level as opposed to regional or lower level competition. Their findings suggested that the ability to manage stress contributed to a lower level of cognitive anxiety and resulted in a higher level of self-confidence.

With a similar focus, Craft, Magyar, Becker and Feltz (2003) conducted a meta-analysis of 29 studies that utilized the CSAI-2 in which there appeared relationships, albeit weak, between performance outcomes and cognitive anxiety, somatic anxiety and self-confidence. Through the use of exploratory modeling they found that self-confidence displayed the strongest and

most consistent relationship with performance among the variables included in the meta-analysis. Butt, Weinberg, and Horn (2003) argued that it is logical that relationships should exist among cognitive anxiety, self-confidence and performance during competition given their relevance to performance outcomes. Hanton, Mellalieu, and Hall (2004) proposed that self-confidence is a fundamental quality that should protect athletes from the debilitating effects of stress-inducing thoughts that can occur in competition. Nonetheless, as Mellalieu, Hanton, and O'Brien (2004) contended, patterns of relationships among anxiety, self-confidence, and performance outcomes also depend on the type of sport participation that is of interest.

Gender and Anxiety

Limited research has examined possible gender differences in mental approaches to sport and there have been particularly few studies of anxiety response in high-risk sports that have included female participants (Celsi, 1995; Goma i Freixanet, 2001). Knowledge is needed relative to the presence of gender similarities or differences in anxiety responses in sport (Cazenave, Le Scanff, & Woodman, 2007) as well as in relation to general patterns of risk-taking behaviors for males and females (Braconnier, 2002; Nicholls, Polman, Levy, & Backhouse, 2009) and differences in competitive anxiety levels have also been noted whereby males tend to report lower levels of anxiety than women although these differences might be the reflection of gender-based cultural norms (Clifton & Gill, 1994; Moritz & Feltz, 2000) or differences in childhood socialization experiences (Giuliano, Popp, & Knight, 2000). From a cultural perspective, risk-taking activities have traditionally been associated with masculine roles (Kerr & Viaminkx, 1997) which may affect anxiety response patterns for both males and females. Finally, the great majority of investigations in sport have been conducted with males and additional research with female athletes would be beneficial (Cazenave, Le Scanff, & Woodman, 2007).

To date, very little is known about the anxiety and self-confidence characteristics of high-level windsurfers and the relation between these psychological factors and resulting performance. Thus, the purpose of this study was to better understand the anxiety (both trait and state) and self-confidence characteristics of these athletes with attention dedicated to understanding potential differences in anxiety characteristics in relation to gender, age of the athlete and associated performance outcomes.

Method

Participants

Seventy-nine participants took part in the present investigation. Fifty four of the participants were professional competitors in the sport and belonged to the Professional Windsurfers Association (PWA). Of these individuals, 35 were male and 19 were female. The remaining twenty-five participants were competitors in a regional competition and all of these participants were male. Overall, participants' mean age was 24.7 years ($SD = 5.8$ yrs.) and the participants ranged in age between 14 and 39 years and represented twenty-five different nationalities.

Measures

The Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990) was used to assess athlete anxiety and self-confidence levels. The CSAI-2 allows for the measurement of state anxiety in the precompetition phase. Three subscales comprise this instrument and assess cognitive anxiety, somatic anxiety and self-confidence with respect to the upcoming competition. For the current study, and keeping in mind the varied national origins of the athletes, both the original English language version of the CSAI and the Spanish language version as translated by Pérez and Caracuel (1999) were used. The CSAI-2 contains 27 items with nine items dedicated to each of the three subscales of cognitive anxiety, somatic anxiety, and self-confidence. A sample cognitive anxiety question is, "I am concerned about this competition". An item from the somatic anxiety scale asks, "I feel tense in my stomach" and a sample self-confidence item is, "I'm confident I can meet the challenge". The CSAI-2 has a four-point response format with one representing "not at all" and four representing "very much so". Martens et al. (1990) reported satisfactory internal consistency of the CSAI-2 with Cronbach alpha coefficients ranging from .79 - .90.

The Sport Competition Anxiety Test (SCAT; Martens 1977) is a 15-item inventory with scores ranging from 10 (low) to 30 (high). A higher score represents a higher level of trait anxiety. The participants respond on a 3-point ordinal scale in accordance with how they usually feel when they are involved in sports. A sample item is, "Before I compete I feel uneasy". The SCAT has demonstrated satisfactory internal consistency with associated Cronbach alpha levels of .95-.97 (Martens et al., 1990).

The CSAI-2 has been utilized in different adventure sports such as paragliders (Filaire, Alix, Rouvez, & LeScanf, 2007) and rock climbers (Maynard, MacDonald, & Warwick-Evans, 1997). The SCAT has been utilized in rodeo and with hang glider pilots (Rainey, Amunategui, Agocs, & Larick, 1992) as well as rock climbers (Feher, Meyers, & Skelly, 1998).

Procedure

Initial contact was made with the amateur and professional competitors during competitions held in July of 2006 on the Canary Islands of Spain. It should be emphasized that different types of windsurfing skills competitions are held and these can be grouped into two categories which include jumps and those that involve speed. In the first category, the modalities of Waves and Freestyle are included whereas within the second category the Slalom 42 competition is held.

The professional athletes were participants in the 2006 World Championship of the Professional Windsurfers Association (PWA) and competed in the Waves, Freestyle and Slalom 42 events held in conjunction with the XVII edition of the Gran Canaria PWA Grand Slam. The amateur competitors were participating in the second edition of the Canary Islands Windsurfing Circuit known as Canarian Waveriders 06 (CWR06), an event that was held on the same beach as that of the professional competition. In this regional event, competition was only held for the Waves event.

To facilitate the greatest number of participants possible, the assistance of the PWA and the CWR06 was solicited. Four psychologists, of whom three had a specialization in sport psychology, conducted the investigation. The collaboration of the participants was obtained immediately prior to the competition and the participants completed the anxiety questionnaires and provided descriptive information relative to age, sex, type of event, years of experience in the sport, hours of weekly training, performance classification during the prior year, and nationality. Subsequently, additional information was obtained with regard to the competitive results obtained during the 2006 season and each athlete's competitive ranking for the year.

Research design and data analysis

An overall descriptive analysis was conducted for each of the variables. Student *t* tests were conducted to compare across gender, professional or amateur status and performance level. Correlational analyses were also conducted for the variables of state and trait anxiety, self-confidence, age and performance classification.

Results

Descriptive information was obtained for anxiety characteristics and self-confidence from the CSAI-2 measure for this sample. Overall, the mean for trait anxiety was 21.57 ($SD = 4.40$). Thus, trait anxiety levels were moderate for the sample as a whole. The respective means were 19.77 ($SD = 5.50$) and 18.21 ($SD = 4.84$) for cognitive and somatic anxiety. For self confidence, the overall mean was 23.27 ($SD = 4.42$).

Table 1. *Anxiety and Self-Confidence Levels by Gender*

	Overall	Women (<i>n</i> =19)	Men (<i>n</i> =60)		
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>t</i>	<i>p</i>
Cognitive Anxiety	21.57(4.40)	19.96 (5.10)	19.71 (5.67)	.16	.87
Somatic Anxiety	19.77(5.50)	18.84 (4.99)	18.00 (4.80)	.65	.52
Self-confidence	18.21(4.84)	23.63 (4.73)	23.15 (4.35)	.41	.69
Trait Anxiety	23.27(4.42)	22.37 (3.39)	21.30 (4.68)	.92	.36

Possible gender differences were also a topic of interest (Table 1). For the variable of cognitive anxiety, *t* tests were utilized for the examination of mean differences. On the variable of cognitive anxiety, males and females had mean scores of 19.71 (*SD* = 5.67) and 19.96 (*SD* = 5.10), respectively, but this gender difference in means was not significant $t(73) = .16, p > .05$. For somatic anxiety, males had a mean of 18.00 (*SD* = 4.80) and females had a mean of 18.84 (*SD* = 4.99) but these were also not significantly different $t(73) = .65, p > .05$. Slight but nonsignificant differences were present for self-confidence with males having a mean of 23.15 (*SD* = 4.35) compared to 23.63 (*SD* = 4.73) for the females $t(73) = .41, p > .05$. For the variable of trait anxiety, males had a mean of 21.30 (*SD* = 4.68) and females a mean of 22.37 (*SD* = 3.39) but this difference was also not significant $t(74) = .92, p > .05$. It should be noted that all female participants in the sample were professional windsurfers.

Possible anxiety-related differences according to professional or amateur status also were examined. No significant differences were found between the groups of athletes and the means for each group on the anxiety variables are reported in Table 2. The relation between age and anxiety was examined through correlational analyses. Cognitive anxiety was significantly associated with age ($r = -.31, p < .01$) in an inverse manner. Thus, older participants had lower cognitive anxiety than did younger participants. No other significant relationships were identified.

The role of ability in relation to self-confidence and anxiety characteristics was also assessed. In this case, the athlete's rank order in terms of their classification in the modalities of Waves, Freestyle and Slalom 42 for the 2006 season was used as the indicator of their ability

level. If an athlete competed in more than one of these events, his or her best ranking was used. A significant and positive relationship was found between somatic anxiety and classification obtained using a Spearman rank order correlation, $r = .30, p = .03$). This finding indicates that athletes with lesser somatic anxiety tended to have better rankings (closer to #1), which is desirable. Cognitive anxiety and performance were not significantly correlated ($r = .25, p = .07$).

To further assess differences in anxiety and self-confidence characteristics in relation to ranking, the participants were categorized into two groups. The first group consisted of those competitors, whether amateur or professional, who placed in the top five in season-long ranking in any of the three events of Waves, Freestyle, or Slalom 42. The remaining participants represented non top five rankers who were placed in the second category. Given differences in group sizes, a Levene's test for the homogeneity of group variances was conducted and this test revealed similarity in variances and indicated that violations of the homogeneity assumption across groups did not occur on any of the variables of interest (gender, competitive status, and level of participation). Table 2 provides the group level data. As can be noted, the only variable that significantly contributed to distinguishing among the groups was self-confidence. In this case, the strong negative relationship indicates that higher levels of self-confidence were found among individuals in the first group (top five placers).

Table 2. Means for Professionals and Amateurs and Between Top-5 and Remaining Competitors on Anxiety Subscales

	Professionals (n=54)	Amateurs (n=25)			Top-5 Placers (n=12)	Non Top-5 Placers (n=67)		
	Mean (SD)	Mean (SD)	t	p	Mean (SD)	Mean (SD)	t	p
Cognitive anxiety	20.37 (5.74)	18.43 (4.76)	-1.41	.16	18.45 (5.82)	20.81 (5.61)	1.23	.23
Somatic anxiety	18.15 (4.93)	18.35 (4.72)	.160	.87	16.55 (5.89)	18.50 (4.60)	1.18	.24
Self-confidence	23.41 (4.28)	22.96 (4.80)	-.41	.68	27.05 (5.16)	22.74 (3.64)	-3.19	.002
Trait anxiety	21.65 (4.09)	21.37 (4.28)	-.26	.80	20.00 (3.81)	21.90 (4.22)	1.41	.17

Discussion

To date, little sport psychology research has been conducted on high-level athletes competing in those types of extreme sports and adventure sports, such as windsurfing, that have flourished in the recent decades. One of the objectives of this study was to examine the general anxiety characteristics of windsurfers since virtually nothing is known in this area. Our findings indicated that, as a group, the windsurfers in the present sample had moderate levels of state and trait anxiety. An additional purpose of the study was to determine whether anxiety differences were present among competitors in relation to gender, age, status, and level of participation.

Our findings were similar to the results obtained by other researchers (Craft, Magyar, Becker, & Feltz, 2003) studying more traditional sports in that these high level athletes generally demonstrated high levels of self-confidence. Nonetheless, it was not possible to compare our results to other high-risk sports due to the shortage of research that has been conducted on self-confidence levels of adventure sport participants.

With regard to anxiety characteristics of high-level male and female athletes, previous researchers have not encountered a consistent set of findings regarding gender-related anxiety patterns. Some researchers have found that female athletes had higher cognitive anxiety levels and lower self-confidence levels than their male counterparts (Jones, Swain, & Cale, 1991) Russell, Robb, and Cox (1998) found higher cognitive and somatic anxiety prior to competition for females as opposed to males. In their study with male and female gymnasts, Cartoni, Minganti, and Zelli (2005) encountered lower levels of precompetition anxiety among the male gymnasts than female gymnasts. Gan and Anshel (2006) conducted a study on elite and non-elite male and female Chinese athletes in relation to the nature of their cognitive appraisal of stressful events in sport and did not find significant gender differences in anxiety, however they did find a significant gender by skill level interaction for stress appraisals. Woodman and Hardy (2003) concluded through their meta-analysis that insufficient research had been conducted on high-level female athletes to make any firm conclusions.

In the present study, all of the female participants were professional windsurfers and there existed no significant differences on anxiety or self-confidence characteristics between them and their male counterparts. The lack of gender differences noted in the present study may be attributable to the relatively high level of sport involvement of these athletes and the concomitant mental skill development that has occurred through experience. Much of the previous research was not conducted with high-level athletes.

A significant and negative relationship was found between age and cognitive anxiety and this may have been the result of the older athletes having had more experience than their

younger counterparts. McEwan (1995) also found that trait and state anxiety tended to be lower among older and more experienced athletes. In a study of veteran distance runners, Sánchez et al (2004) found that precompetitive state anxiety levels tended to be lower in experienced veteran distance runners relative to younger runners.

No notable differences were found between professional and amateur windsurfers on the anxiety and self-confidence variables. Most previous studies have revealed lower levels of anxiety among athletes at higher levels of competition (Gould, Petlichkoff, & Weinberg, 1984; Humara, 1999). This finding could be attributed to the fact that relatively small differences exist in the level of competition between the professional and the amateur windsurfers engaged in competition in contrast to other sports where the professional level is far superior in quality. In the present case, the only stipulation regarding participation in the amateur competition that was included in this study was that the competitor not have placed in the top 30 at the PWA World Championship in 2005.

A further objective of this study was to assess whether state and trait anxiety were related to season-long performance. A significant relationship was found between performance ranking and pre-competition somatic anxiety. In this case, athletes who received better performance rankings in their events had lower pre-competitive somatic anxiety than those with poorer rankings. These findings are consistent with those obtained by Guillén and Sánchez (2009). The relationship between cognitive anxiety and performance ranking approached significance in that athletes achieving better season-long performance rankings tended to have lower cognitive anxiety. Self-confidence was found to be related to performance outcome when athletes were categorized into top-5 placers and non-top 5 placers. In this case, athletes who placed in the top five in any event had significantly higher self-confidence than those athletes who did not place in the top five. These results are consistent with those obtained by Hanton, Mellalieu, and Hall (2004) and Antonelli et al. (1986). These findings are also consistent with those from the meta-analysis conducted by Woodman and Hardy (2003) and by Craft et al. (2003) in that better performance was associated with higher precompetition self-confidence.

Future research addressing anxiety and self-confidence characteristics in competitive windsurfers is needed. This line of research can be strengthened through an inclusion of the variable of anxiety direction as has been recommended by Jones and Swain (1992). Anxiety direction refers to individuals' perceptions as to whether their anxiety facilitates or detracts from their performance. Also, it would be interesting to measure self-efficacy as a variable that can exercise influence on the relation between anxiety direction and performance, as Feltz (2006) suggests. Research that can further our understanding of psychological characteristics of athletes in any given sport can inform and strengthen sport-specific psychological interventions and research specific to windsurfing competition.

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