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Competitive Anxiety in Lifesavers and Swimmers

Eleftheria Avramidou, Stathis Avramidis, and Remco Pollman

This study examined state and trait anxiety in competitive lifesavers and swimmers. The participants completed the SAS and the CSAI-2d before a training session and the CSAI-2d again before a competition. The competitive lifesavers were found to have lower levels of cognitive and somatic anxiety than competitive swimmers. Both groups were found to have lower levels of self-confidence but higher levels of somatic anxiety before a competition than before regular training sessions. Lifesavers found their levels of somatic anxiety to be more facilitative than the swimmers did. Both groups perceived that higher levels of self-confidence were more facilitative before competition than before training. Differences in the relationship between state and trait anxiety for swimmers and lifesavers were observed. The generally lower levels of cognitive and somatic state anxiety in lifesavers and their interpretation of somatic anxiety during competition would benefit their performance and decision making.

Key Words: lifesaving, swimming, lifeguarding

Swimming is historically older than lifesaving; it has been reported as part of human activity since ancient times (Holmer, 1974; Lewillie, 1983). Scientific research in swimming originated more than 80 years ago (Holmer). In the last 30 years, an increasing interest in research in swimming has been observed (Hanton, 1997). Swimmers, like other athletes, can experience stressful situations before training sessions, as well as before competitions. Several studies have investigated anxiety in groups of competitive swimmers (Hanton, 1999; Wiggins, 1998) and even beginners (Berger & Owen, 1983; Starek & McCullagh, 1999).

Competitive lifesaving has been a very popular sport over the last century (Booth, 2000), even becoming an official sport through the International Life Saving Federation (International Life Saving, 2001). Many countries have developed guidelines, rules, and regulations for competitive lifesaving at junior and senior levels either for games held at pools or in open water (International Life Saving, 2001; Irish Water Safety 2001a, 2001b; Starek & McCullagh, 1999; Surf Life Saving Association Australia, 2001; Surf Life Saving Association of Great Britain, 2001; United States Lifesaving Association, 1998). Nevertheless, little research has been

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done on the psychological demands on lifeguards as professionals (Avramidis, 1998, 2002; Griffin, 1972), and to date no studies have been conducted on the psychological aspects of competitive lifesaving.

Lifesaving and lifeguarding as a profession and a competitive sport combine elements of swimming, rowing, surfing, and running. Traditionally, the purpose of the lifeguarding profession has been to save human lives. For this purpose, lifeguards have to test their skills on a regular basis by competing against their own limits, the forces of nature, and the struggles of victims. Over time, lifeguarding skills have been developed into competitive sport events, as well. These competitions involve athletes of all ages.

Many youths begin training as lifeguards through junior programs (Wernicki & Glorioso, 1997). Many thousands of lifeguards are trained and certified annually all around the world, so it is reasonable to assume that these unique athletes can benefit from scientific support for achieving optimal performance. One of the factors that have been found to influence athletic performance is anxiety. Lifeguards, like other athletes, can be affected by the debilitating effects of anxiety. Lifesaving, in this respect, could be viewed as a unique sport and physical activity. Lifesavers deal with extreme human emotions because they are ultimately involved with saving human life. To our knowledge, no scientific studies have been published that have examined the relationship between anxiety and performance in competitive lifesavers.

Anxiety in Sport

An issue for all athletes including swimmers and lifesavers is to maintain some sort of control over their internal state. Ultimately, one would like to reach a psychological and physiological status that will allow performance at the highest level of one's ability. There are many forces acting on athletes preventing them from reaching this state. Anecdotal and scientific evidence have shown that anxiety might be one reason that athletes do not achieve their full potential. For example, research has found that fear of failure, negative social evaluation, concerns about injuries or physical danger, and fear for the unknown elicited anxiety in ice hockey players (Dunn, 1999; Dunn & Syrotuik, 2003).

Although there have been many theories and models that have tried to clarify the relationship between anxiety and performance, there appears to be a consensus on the notion that anxiety is multidimensional (Woodman & Hardy, 2001, 2003). Anxiety consists of three independent but interacting components: somatic (emotional), cognitive (worry), and behavioral (Davidson & Schwartz, 1976). Somatic anxiety is the physical manifestation of anxiety and includes the bodily symptoms of autonomic reactivity (e.g., pounding heart, increased perspiration, rapid shallow breathing, and increased muscle tension). Cognitive anxiety, on the other hand, can be described as "negative expectations and cognitive concerns about oneself, the situation at hand and potential consequences" (Morris, Davis, & Hutchings, 1981, p. 54). Finally, the behavioral component refers to aspects such as facial expressions, communication patterns, and restlessness (Gould, Greenleaf, & Krane, 2002). The relationship between the behavioral component of anxiety and performance is unclear. It has been suggested that cognitive anxiety might influence all forms of athletic performance, whereas somatic anxiety tends to disrupt fine motor skill more than gross motor activities (Lavalley, Kremer, Moran, & Williams, 2004).

Since the work of Spielberger (1966), it has been well established that researchers have to distinguish between anxiety as a persistent personality characteristic (trait anxiety) and anxiety as a transient mood state (state anxiety). The latter is the “right now” feeling of apprehension and tension in a specific situation (Gould et al., 2002), whereas the former is a general disposition of certain individuals to feel anxious in certain environmental situations (Moran, 2004). As expected, research has shown that people with high levels of trait anxiety are more likely to interpret a situation as threatening than people low in trait anxiety (Scanlan & Passer, 1978).

Traditionally, anxiety has been viewed as a negative emotional state; that is, it is perceived as something that is detrimental to performance. More recently, however, it has been suggested that our personal interpretation of our own arousal levels is important in the experience of anxiety. Arousal is considered undifferentiated bodily energy, whereas anxiety is an emotional label for a particular type of arousal experience (Hanton, 1997). The way an athlete perceives his or her arousal level can result in the situation being judged as either positive and challenging or, on the other hand, negative and overwhelming (Lavallee et al., 2004). The notion that the interpretation of arousal level can be either facilitative or debilitating has been supported in studies by Jones and colleagues (see Jones & Swain, 1992, 1995). In their studies it was shown that similar intensity levels of anxiety were differently interpreted by the participants (in this case, cricketers). Depending on their level of expertise, more experienced cricketers labeled anxiety as more facilitative to their performance. To this end researchers should measure not just the intensity or the amount of anxiety experienced by athletes but also its direction (i.e., how individuals are interpreting it).

Research Evidence

The level of precompetitive anxiety has been shown to differ depending on certain characteristics such as sport type (Furst & Tenenbaum, 1986; Martens, Vealey, & Burton, 1990), experience (Swain & Jones, 1996), age (Brustad, 1988), and gender (Jones & Cale, 1989; Jones, Swain, & Cale, 1991; Martens et al., 1990). For example, individual athletes experience higher levels of anxiety than team athletes (Griffin, 1972; Simon & Martens, 1979), and experienced athletes report lower levels of cognitive and somatic anxiety than do less experienced athletes (Swain & Jones, 1992). Furthermore, females have generally been found to have higher levels of cognitive and somatic anxiety and lower self-confidence than males (Ho et al., 2000; Jones et al., 1991). These latter findings have recently been challenged in a meta-analysis (Woodman & Hardy, 2003) of the impact of state cognitive anxiety and state self-confidence on sport performance. That study found that gender and level of performance were important moderator variables. Overall it found that cognitive anxiety had an insignificant negative effect on performance ($r = -.10$), and self-confidence, a low to moderate positive effect ($r = .24$). Men were more affected than women, and more highly skilled athletes were more affected than lower skilled athletes, by cognitive anxiety. Similar results were observed for self-confidence. Self-confidence was significantly more influential for men ($r = .29$) than for women ($r = .04$) and for athletes performing at a higher level ($r = .33$) than for lower level athletes ($r = .16$). The authors of that study argued that somatic anxiety was of limited value in explaining performance (Woodman & Hardy, 2003).

As indicated earlier, no studies have been conducted exploring the relationship between anxiety and performance in lifesavers. We can only discuss the studies that have been conducted on competitive swimmers. In a study by Jones, Hanton, and Swain (1994) the debilitating and facilitative natures of anxiety in competitive swimmers were investigated using skill level (qualifiers for the British Olympic trials vs. participants at the British Universities Sports Federation Open Championships) as an independent factor. The study did not find any significant differences in either cognitive- or somatic-anxiety intensities between the skill levels. The elite performers, however, reported significantly more facilitative and less debilitating interpretations of both cognitive and somatic anxiety. Most of the elite swimmers (85.3%) reported that anxiety was facilitative, in comparison with only 47.7% of the non-elite athletes. Based on such findings it was hypothesized that athletes would benefit from training that would help them interpret their arousal levels positively and constructively. In this respect, research has shown that elite swimmers indeed benefited from learning to interpret preperformance anxiety in a positive, facilitative manner (Hanton & Jones, 1999).

In swimming it has been found that state anxiety can have either positive or negative effects on performance. Furst and Tenenbaum (1986) found that higher levels of state anxiety facilitated swimming performance, whereas Burton (1988) found that overly anxious swimmers swam more slowly. In the latter study a negative linear trend was found between cognitive anxiety and swimming performance, and a positive linear trend between self-confidence and performance. For the two samples used in that study cognitive anxiety accounted for 46% of the variance in swimming performance and self-confidence accounted for approximately 21% of the variance in performance.

Finally, in a small-scale study (Nordell & Sime, 1993) investigating the relationship between competitive-trait and state-anxiety levels of swimmers, no relationship was found between competitive trait and state anxiety.

Aims of the Study

The literature suggests that high levels of anxiety could impede performance and decision making in athletes in general and lifeguards in particular. Therefore, the aim of the present research project was to examine the relationship of psychological components of state and trait anxiety in lifeguards and swimmers. Swimmers were deemed a suitable control group because they are engaged in activities similar to those of lifeguards but without the additional stressors of dealing with saving human life. Furthermore, we investigated the effect of competitive lifeguard events on state-anxiety intensity and direction.

Method

Participants

Twenty competitive swimmers in a local swimming club (mean age = 21.0 years, mean years of experience = 7.0) and 20 lifesavers (mean age = 20.9 years, mean years of experience = 12.7) volunteered as participants in this study. Their selection was based on the level of their experience and their availability.

Instruments

In this study we used the sport-specific Sport Anxiety Scale (SAS; Smith, Smoll, & Schutz, 1990) to measure the participants' multidimensional cognitive and somatic trait anxiety. The inventory consists of 21 questions and three subscales: somatic anxiety, worry, and concentration disruption. The three-factor structure was recently confirmed in another study, by Dunn, Dunn, Wilson, and Syrotuik (2000), who also found good internal-consistency coefficients for this questionnaire (ranging between $r = .88$ and $.69$). Finally, the SAS has shown satisfactory test-retest reliability ($r = .77$; Smith et al.).

The modified version of the Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990), the CSAI-2d (Jones & Uphill, 2004), was used to measure the participants' intensity of state anxiety, as well as its direction (facilitative or debilitating). The CSAI-2d consists of three subscales, cognitive anxiety, somatic anxiety, and self-confidence, and is a self-administered questionnaire consisting of 27 items rated on a 4-point Likert scale (with 1 representing *not at all* and 4 *very much so*). Scores can range from 9 to 36, with higher scores indicating higher intensities of cognitive and somatic anxiety, as well as higher levels of self-confidence. Satisfactory validity and reliability have been reported for the CSAI-2, with internal-consistency estimates ranging from $.76$ to $.91$. In this study we used the CSAI-2d version, which has a second column assessing whether participants experienced the individual items as either facilitative or debilitating (direction of anxiety). The scores in this column could range from -3 , *very negative*, to $+3$, *very positive*. Total scores could range from -27 to $+27$, with more-positive scores indicating a facilitating effect and negative scores a debilitating effect. Internal-consistency reliability estimates for the facilitative-debilitative measure range from $.72$ to $.83$ (Swain & Jones, 1996).

Procedure

The Grand Prix national-level competition was selected as the testing venue for the swimmers. Likewise, lifesavers were tested while participating in South Leeds Lifesavers' annual competition, an event that attracts successful athletes who have won lifesaving competition more than 15 times at local, regional, and national levels.

The participants completed the SAS and CSAI-2d questionnaires before a training day and the CSAI-2d again before the competition. The questionnaires were given to the participants about 20 min before the training session and about 40 min before the competition. The nature of the study was explained to the participants after they had completed each of the questionnaires.

Results

Correlations were first calculated for the lifesavers and swimmers separately between the trait-anxiety subscales and the anxiety-intensity subscales. For the swimmers the somatic-anxiety and worry subscales of the SAS were found to be correlated with all three subscales of the CSAI-2d (correlations between $.51$ and $.76$) during both the competitive situation and the training situation. For the lifesavers, however, only the worry subscale of the SAS was significantly correlated with cognitive state anxiety ($r = .62$) and self-confidence ($r = -.67$) during training, and concentration disruption, with self-confidence ($r = -.65$) during competition.

Multivariate analysis of variance (MANOVA) was conducted to examine whether there were differences in the intensity of anxiety between the swimmers and lifesavers. Significant main effects for sport (Wilks's Lambda = .762, $p < .001$) and condition (Wilks's Lambda = .703, $p < .001$), but no interaction (Wilks's Lambda = .955, $p < .332$), were found. Follow-up univariate analysis of variance (ANOVA) revealed significant main effects between the lifesavers and swimmers for cognitive-anxiety intensity ($p < .001$) and somatic-anxiety intensity ($p < .001$) but not for self-confidence intensity ($p = .39$). That is, lifesavers had overall lower levels of cognitive- and somatic-anxiety intensity than did the swimmers. Furthermore, both lifesavers and swimmers experienced higher levels of somatic-anxiety intensity ($p < .001$) and less self-confidence ($p < .001$) during competition than in the training situation. Cognitive-anxiety intensity approached significance ($p = .06$).

The MANOVA examining the direction of anxiety (whether it was perceived as facilitative or debilitating) again showed a significant main effect for sport (Wilks's Lambda = .874, $p = .018$) and condition (Wilks's Lambda = .899, $p = .047$) but no interaction (Wilks's Lambda = .965, $p = .446$). The univariate ANOVA revealed that for sport there was a significant difference between the swimmers and the lifesavers for somatic anxiety ($p = .04$) but not for cognitive anxiety ($p = .24$) or self-confidence ($p = .16$). Lifesavers, in this respect, found their levels of somatic anxiety more facilitative than the swimmers did. With regard to the conditions (training vs. competition), a significant difference was found only for self-confidence ($p = .007$), not for cognitive ($p = .27$) or somatic ($p = .26$) anxiety. Both lifesavers and swimmers perceived higher levels of self-confidence to be more facilitative before competition than before training.

Discussion

As expected, we found that the competitive environment increased the intensity of somatic anxiety and decreased the level of self-confidence in both the swimmers and the lifesavers, whereas cognitive-anxiety intensity was not significantly different. Lifesavers, however, had generally lower intensities in cognitive and somatic anxiety than did the swimmers, and they interpreted somatic anxiety as more facilitative to their performance. Finally, whereas the somatic and worry components of trait anxiety were correlated with all scales of the CSAI-2d for the swimmers, only the worry subscale was correlated for the lifesavers with cognitive anxiety and self-confidence during training, and concentration disruption, with self-confidence during competition.

It is generally believed that competition is a more anxiety-provoking environmental situation than regular training sessions. Therefore, it was not surprising to find that somatic and cognitive state-anxiety intensity were generally higher and self-confidence lower in the competitive situation than in the training situation. Lifesavers were generally lower in cognitive and somatic anxiety than the swimmers. Woodman and Hardy (2001) recently suggested that although somatic anxiety is a useful physiological index of anxiety, it is of little relevance in explaining the relationship between arousal and performance. The findings of the present study would urge caution in making such an interpretation. Not only did competition result in a significant increase in somatic-anxiety intensity in both groups, but there were also differences in the interpretation of the anxiety between the swimmers

and lifesavers. The lifesavers, in this respect, viewed somatic anxiety as more facilitative to performance. An explanation for this difference could be the years of experience the participants had in their respective sports. Lifesavers in this study had participated significantly longer in their sport than the swimmers. Previous studies (Jones & Swain, 1995) have shown that experienced athletes generally perceive anxiety as more facilitative and less debilitating than their less experienced counterparts. Interpreting your bodily sensations as helpful rather than viewing them as negative and disruptive feelings would be most likely to be helpful in performance and decision making. A recent study (Hanton & Jones, 1999) in which swimmers were trained to reinterpret their anxiety symptoms attests to this notion. Despite the findings, expertise helps athletes redefine their somatic symptoms. From an applied perspective it would be beneficial to athletes to design mental-training programs that would help them interpret their anxiety symptoms in an appropriate manner, thereby facilitating future performance and functioning. We think that this could be particularly relevant to competitive lifesavers. Actual lifesaving performance is generally a more complex activity than swimming, involving critical decision making while exercising at high intensity levels. If somatic (or cognitive) symptoms of state-anxiety intensity are viewed as negative and debilitating, this could compromise performance and ultimately could cost human life.

The finding that self-confidence was lower in the competitive situation than in the training situation was accompanied by the result that swimmers and lifesavers viewed these lower levels of self-confidence as more facilitative during competition. This suggests that athletes might interpret their levels of self-confidence differently depending on situational factors. Generally, lower levels of self-confidence are associated with lower levels of performance (Burton, 1988; Woodman & Hardy, 2003). More research is required to investigate the relationship between self-confidence intensity, direction, performance, and environmental conditions more fully.

The finding that lifesavers had generally lower levels of state anxiety than the swimmers could be related to their respective trait-anxiety levels. For both groups higher levels of worry (trait) were associated with higher levels of state cognitive anxiety during training. For the swimmers, however, worry and somatic trait anxiety were also associated with higher levels of somatic anxiety and lower levels of self-confidence during training. Furthermore, somatic and worry trait anxiety were associated with all three components of state anxiety during competition. On the other hand, for the lifesavers only concentration disruption was associated with self-confidence during competition. These results point to a close relationship between trait and state anxiety for the swimmers but not the lifesavers. One reason for this observation could be that lifesavers had generally lower levels of trait anxiety for all three subscales and therefore would react to stressful or anxiety-provoking situations differently than the more trait-anxious swimmers. This observation is partly supported by the finding that, overall, lifesavers had lower levels of state anxiety and a facilitating interpretation of somatic anxiety.

This finding could be regarded as desirable for lifesavers. As stated before, lifesavers have to make critical decisions while exercising and performing at high intensities. It could be argued that high trait anxiety is a serious disadvantage for lifesavers, whose behaviors and decision-making capabilities would be negatively influenced by this personality trait. Swimming, on the other hand, is a sport that takes place in a more controlled, stable, and closed environment. It is generally

suggested that people with personality tendencies such as neurosis or introversion are less likely to engage in such activities. Because of the higher functioning of their reticular-activation system and a hypervisceral brain, such people would be expected to react to stressful situations with higher emotional reactivity (Eysenck, 1992; Zuckerman, 1979). Although this study did not explicitly investigate differences in personality characteristics between swimmers and lifesavers, we suggest that future investigations could take such aspects into consideration. It might well be that the sport of lifesaving demands some significantly different personality trait than competitive swimming. Perhaps competitive swimmers do not have the temperament to become successful lifeguards.

In conclusion, the results of the present study support the notion that the direction of anxiety should be measured along with the intensity of anxiety. The interpretation of our anxiety symptoms appears to be an important factor for future functioning. Furthermore, expertise might moderate an athlete's interpretation of somatic symptoms. The lifesavers were found to have different trait-anxiety and state-anxiety profiles than the swimmers in this study. The lifesavers had a "favorable" relationship between trait and state anxiety and lower levels of somatic and cognitive state anxiety and interpreted somatic anxiety as more facilitative. We suggest that these findings indicate advantages for lifesavers who participate in their sport to be able to perform at the highest levels of their ability. In order to make the correct decision under pressure while physically performing at high intensities would be problematic if one were highly anxious. Finally, we recommend the inclusion of psychological training programs in the training regimen for both lifesavers and swimmers in order to help them better deal with their experiences of somatic, as well as cognitive, anxiety.

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