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Gender and Achievement-Level Differences in Competitive State Anxiety and Self-Confidence Among Boxing Athletes

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Abstract

The competitive state anxiety is commonly acknowledged as a critical psychological construct affecting the performance of athletes, however, its interrelation with gender and competitive achievement levels have been subjects of very sparse empirical research on the area of combat sports. The current study compared gender-specific variations and the level of achievement in somatic anxiety, cognitive anxiety and self-confidence in high-level boxing athletes using a multidimensional analysis. A sample of 67 competitive boxing athletes completed validated psychometric measures with internal consistency coefficients of $\alpha = .727$, $\alpha = .837$, and $\alpha = .817$ for somatic anxiety, cognitive anxiety, and self-confidence respectively. The Gender × Achievement Level interaction approached but did not reach significance, Pillai's Trace = .109, $F(3, 61) = 2.490$, $p = .069$. A significant interaction was confirmed for self-confidence only, $F(1, 63) = 5.68$, $p = .020$, $\eta^2p = .083$. These findings partially support interaction-based models of competitive anxiety and highlight gender-sensitive confidence development as a priority for psychological preparation in elite boxing. Practical implications for sport psychologists and coaches are discussed based on the findings of the empirical studies.

Keywords: competitive anxiety, somatic anxiety, cognitive anxiety, self-confidence, gender, boxing, combat sports, elite athletes, interaction effects

Introduction

One of the most widely studied psychological constructs in sport psychology is competitive state anxiety and has repeatedly been found as a decisive factor on the performance of athletes. It is defined as a multidimensional construct consisting of three connected elements namely cognitive anxiety, which is the negative expectancy and negative pattern of thought; somatic anxiety which is the subjective experience of physiological arousal expressed in terms of increased heart rate and muscle tension and last, self-confidence which is the positive aspect of competitive state anxiety and it acts as a psychological buffer against performance disruptors. Early conceptualizations assumed that there existed a linear association of anxiety with performance whereas modern conceptualizations have developed further than this conceptualization. The catastrophe model assumes that physiological arousal and cognitive anxiety work together to

bring about performance under high-pressure circumstances to an abrupt, nonlinear decline. On the same note, the Individual Zones of Optimal Functioning model (Hanin, 2000) highlights the fact that the effects of anxiety are very much personalised; the effects of the resultant anxiety range have an optimal level that is determined by an athlete, in which performance is optimal. Both of the models are united by the fact that studying the anxiety components in isolation, without their interactions with the individual and contextual variables provide incomplete description of the competitive psychological states.

Boxing and combat sports, in general, offer one of the most special psychological settings that makes them unlike most other sports. Compared to team sports, boxing is characterized by direct-one-on-one physical confrontation, persistent physiological stimulation and consistent evaluative judgment of the officials and the spectators. These states of heightened physiological arousal coupled with cognitive threat appraisal raise the threshold of psychological intensity of a pre-competitive state which makes boxing a uniquely relevant context in which to observe competitive anxiety process. With this, boxing is being underrepresented in sport-anxiety research as compared to team and individual non-contact sports.

Gender is an established modulator of competitive anxiety, where female athletes tend to report higher rates of both cognitive and somatic anxiety than male athletes but there are inconsistencies in this relationship between all sports and competitive environments. Another theoretically salient variable, which is achievement level operationalised in terms of state versus national competitive standing, is associated with increased adaptive anxiety construal and enhanced self-confidence. However, the interactive influence of gender and achievement level in the multidimensional elements of competitive anxiety has been given little systematic coverage especially in combat sporting contexts.

The current study will fill this gap through exploring the differences between genders and differences between human athletes at the achievement levels in terms of somatic anxiety, cognitive anxiety, and self-confidence in competitive boxing sport with special attention to the interaction effects.

Hypotheses

H1: There will be a positive and significant correlation between cognitive and somatic anxiety, as well as negative correlation between them and self-confidence.

H2: No significant main effects of gender or achievement level will be observed upon the multivariate combination of anxiety and confidence variables.

H3: A significant Gender × Achievement Level interaction will emerge reflecting differential anxiety and confidence profiles across subgroups.

Method

Participants

The sample consisted of 67 competitive boxing athletes, female national medalists (n = 13), female state medalists (n = 13), male national medalists (n = 26), and male state medalists (n = 15).

Procedure and Analysis

- Ethical approval was obtained from the institutional review board and all participants provided written informed consent prior to participation.
- All participants had a minimum of two years of organized boxing experience.
- Questionnaires were administered within 60 minutes prior to competitive bouts.

- Pillai's Trace was selected as the primary multivariate statistic due to its robustness to violations of distributional assumptions.
- Data were analyzed using descriptive statistics, Pearson correlations, two-way MANOVA, and follow-up univariate ANOVAs.
- Effect sizes were interpreted using Cohen's (1988) benchmarks: .01 small, .06 medium, .14 large.

Measures

Somatic anxiety (α = .727), cognitive anxiety (α = .837), and self-confidence (α = .817) were assessed using validated competitive state anxiety instruments.

Results

The Pearson correlation test has shown the statistically significant relation between cognitive and somatic anxiety (r =.719, p <.001, df = 65). Additionally, somatic anxiety (r = -.512, p <.001) and cognitive anxiety (r = -.594, p <.001) were also negatively correlated with self-confidence, which also supports the hypothesis defining the theoretical framework of the multidimensional competitive anxiety model.

Two-way multivariate analysis of variance (MANOVA) revealed that there were no significant main effects of gender (Pillai's Trace = .054, F(3, 61) = 1.153, p = .335) or achievement level (Pillai's Trace = .024, F(3, 61) = 0.495, p = .687). The Gender × Achievement Level interaction approached but did not reach statistical significance at the multivariate level (Pillai's Trace = .109, F(3, 61) = 2.490, p = .069).

Follow-up univariate ANOVA for self-confidence showed that the interaction effect is significant (F(1, 63) = 5.68, p = .020, η2 p = .083) meaning a medium effect size. There were better scores of self-confidence (M = 32.6) in female national medalists in comparison with female state medalists (M = 27.6); male national medalists (M = 29.5) had lower scores of self-confidence compared to state medalists of this category (M = 30.7).

The interaction effect of somatic anxiety was not statistically significant (F(1, 63) = 2.20, p = .143, η^2p = .034) however, the descriptive statistics suggested a crossover design and, in this case, female national medalists (M = 13.8) were less anxious about somatic anxiety than female state medalists (M = 17.4), and male national medalists (M = 17.6) and male state medalists (M = 17.5) showed similar levels. In the same way, the interaction effect on cognitive anxiety was non-significant (F(1, 63) = 0.499, p =.483, η2p = .008).

Discussion

The current research investigated the gender and achievement level disparities of competitive state anxiety and self-confidence in the boxing athletes on the multidimensional framework. The interaction of results gives some backing to interaction-based theoretical conceptualizations of competitive anxiety, but also makes significant asides as to which particular psychological components are sensitive to gender-achievement combinations and which are psychologically relatively stable. Although this does not meet the 0.05 test, the effect size and the directional trend indicates that there is indeed some significant trend that should be pursued. That results show no considerable main effects of either of the genders or achievement level alone would be theoretically consistent with models which stress that the factors should be considered jointly and not alone since the complexity of the pre-competitive psychological state is difficult to explain through the use of one factor alone. The observation of achievement level and it alone as not being sufficient to account any psychological profiles of competitive boxing athletes was only observed in self-confidence, F(1, 63) = 5.68, p =.020, η^2p = .083. This is a medium effect size. Self-confidence levels in female national medalists were reported to be significantly higher (M = 32.6) than with female state medalists (M = 27.6) and male national medalists were marginally

lower (M = 29.5) than male state medalists (M = 30.7). This cross over phenomenon is theoretically significant. In the case of the female boxing athletes, such as sportswomen, the promotion to the national level seems to be conditional with the significant increase in self-confidence which can possibly indicate the sum of successful competition experiences, an increased sense of self-efficacy beliefs, and the establishment of more consistent pre-competition psychological routines over time. This explanation is in line with the studies that reveal that competitive experience stimulates relatively adaptive resources of self-confidence among women athletes in high-demand sporting situations. In relation to male athletes, the relatively reduced self-confidence at the national level compared to the state level should be interpreted with attention. Instead of being indicative of a psychological inadequacy, this tendency is probably an objective and experience-based evaluation of the increased demands of the competition in male boxing of elite level. The physical intensity, quality of opponents and competitive stakes are significantly higher at the national level and some recalibration of confidence, in turn, may be predictable and germane. Such an interpretation complements theoretical points which argue that the more advanced athletes are in terms of competitive level, the more accurate the self-assessment is instead of the inflated confidence which is demonstrated in the face of the objectively greater challenge. The descriptive pattern is interesting and it cannot be ignored even though the interaction between the somatic anxiety and the self-assessment was not significant in statistical sense $F(1, 63) = 2.20$, $p = .143$). The female national medalists had lower somatic anxiety (M = 13.8) than female state medalists (M = 17.4), and it can be possible that with further exposure to high-level competition female boxers develop more beneficial skills in physiological arousal regulation. However, there was no significant difference in the level of somatic anxiety between male national and state medal winners (M = 17.6 and M = 17.5 respectively), whereas somatic arousal could be more uniformly increased in male boxers of different levels of achievement, perhaps due to the high levels of physical task required on a regular basis. A lack of statistical significance of this interaction can partially be attributed to the fact that there is inadequate statistical power considering presently adopted sample size. Cognitive anxiety showed no significant interaction effect, $F(1, 63) = 0.499$, $p = .483$, $\eta^2p = .008$, and was relatively constant throughout the various gender-achievement subgroups. This result is indicative of the fact that evaluative, worry-focused aspect of pre-competitive anxiety is comparatively indifferent to the contextual factors of gender-achievement that were investigated in this particular study. In contrast to somatic anxiety and self-confidence which seem more driven by the competitive experience amassed and its correlations with gender, cognitive anxiety might be even more influenced by gender-specific individual-level psychological factors including trait anxiety, perfectionism, and coping approach. There are direct practical implications to this fact - the cognitive and somatic anxiety are interdependent constructs and group-based programs based on gender or competitive status will not provide adequate solutions to cognitive anxiety issues. The overall negative relationships between the two elements of anxiety as well as self-confidence also support the theoretical framework of the multidimensional competitive anxiety model whereby self-confidence serves as a compensatory psychological resource that moderates the otherwise debilitative effect of high levels of anxiety.

Clinical Implications

The findings of this study have substantive implications on the sports psychologist and boxing coaches who work in various gender and competitive levels. The psychological preparation programmes must be gender and achievement-sensitive, and must not use standardised protocols on the management of anxiety. In the case of female athletes who are at state-level of competition but in a situation where they are to switch to a national competition, self-efficacy theory based confidence-building interventions seem to be particularly relevant, as the interaction with self-confidence has been identified as strong. Moreover, somatic regulation procedures such as progressive muscle relaxation, controlled breathing, pre-performance activation routines can be helpful in the acquisition of the physiological arousal-management competencies which as per the descriptive information are at an early stage among state level athletes (women). Psychological assistance to male athletes competing internationally at the national level could be better channeled towards reappraisal-guided techniques which, instead of perceiving pre-competitive arousal as a warning of excessive competition, should cause athletes to perceive such arousal as a positive indicator of competition preparedness. Training of cognitive anxiety management in all subgroups should be implemented using personalized

training on the use of psychological skills, including cognitive restructuring, rational emotive behaviour therapy, and mindfulness-based approaches, regardless of gender or competitive level.

Limitations and Future Directions

There are a few shortcomings of the current research that should be mentioned. The sample size used was sufficient to the utilized statistical design although it might have limited power to identify smaller interaction effects as expressed by the small significant but descriptively patterned interaction on somatic anxiety. Future research that would utilize larger samples would provide greater power to test these trends with greater certainty. The cross-sectional design does not allow the use of causation and the data do not allow concluding whether competitive experience is the reason to change the anxiety profiles or athletes with specific psychological profiles are more likely to attain the national status. Measurements were not taken at multiple time points before the competition and this does not reflect the dynamic changes in anxiety occurring throughout the process of competition. It would be beneficial to design longitudinal designs that monitor anxiety trajectories during the season of competitions along with the addition of other psychological variables (trait anxiety, coping style, years of experience, training volume, and others). Cross-cultural replication research would also help in achieving a clear understanding of whether the interaction complexities that are evident here are unique to the Indian boxing case or of macro phenomenological considerations within the psychology of competitive fighting sports psychology.

Conclusion

Not only an intense physical training is required in competitive boxing, a close understanding of the mental states that athletes arrive at competitions with is also required. The current research study aimed to identify the extent to which gender and level of achievement have a differing level of influence in these psychological states and the result of the research revealed a more intricate pattern than would have been suggested by simple main-only analyses.

Amongst the three psychological elements tested, self-confidence showed the highest sensitivity to cross-interaction of gender and competitive status. The crossover effect, which was observed, i.e., the national-level experience had an indirect positive correlation with high-confidence in female athletes and a slightly negative correlation with male athletes, indicates that there are differences in the development of psychological resources between the two genders. This trend does not mean that one of the two groups lacks something, but it serves to demonstrate how the exigencies and symbolic senses of competition among female and male boxers vary and are rarely integrated into the current psychological training programmes.

The descriptively significant, but statistically insignificant relationship was observed between somatic anxiety and the investigated group of cohorts, and overall consistency in cognitive anxiety was quite constant. All of these findings suggest that different aspects of competitive anxiety do not react equally to any contextual factors hence the ineffectiveness of intervention strategies used universally with all athletes.

The practical implication is obvious: any psychological intervention in boxing requires individualization. Competitive level and gender ought to be used to design confidence enhanced and arousal regulation programs and not should be brought in as background variables. The analysis could be enhanced in future by tracking the athletes longitudinally, including heterogeneous and larger sample sizes, and analysing the cultural determinants that influence the lives and ways of control of pre-competitive psychological states among Indian boxers.

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