

Competition Anxiety in Equestrians Across Different Disciplines and Performance Levels

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Abstract

Competition anxiety among equestrians has been examined very little so far. Therefore, this study investigated the extent and distribution of competition anxiety in female and male equestrians. Furthermore, it was examined whether there are specific differences among equestrians in different disciplines (dressage, show jumping, western, recreational, and eventing) and performance levels. The sample ($N = 406$) consisted of female ($n = 385$) and male ($n = 21$) German competition riders (mean_{age} = 34.84). Competition anxiety (somatic anxiety, concern, concentration (decrease)) was measured with the Competition Anxiety Inventory Trait (German: Wettkampf-Angst-Inventar/WAI-T). The data analysis was based on t -tests, analyses of variance (ANOVAs) including post-hoc tests and correlation analyses. The results reveal that equestrians in higher-level performance classes (2, 3, and 4) had lower perceptions of somatic anxiety (mean_{class 2} = 8.70; mean_{class 3} = 9.13; mean_{class 4} = 9.79) than respondents in lower-level classes (mean_{class 6} = 11.76, $p < .001$). There were differences among the disciplines in concern ($p < .01$) and concentration (decrease); ($p < .001$). Dressage riders showed higher concern scores (mean = 10.67) than western riders (mean = 7.90). Furthermore, dressage riders scored higher on concentration (decrease) (mean = 7.57) compared to show jumping (mean = 6.69) and eventing (mean = 5.76). Equestrians competing in show jumping (mean = 6.69) had significantly lower concentration (decrease) scores than in recreational riding (mean = 8.22). Female riders (mean = 1.71) rated worrying thoughts as more performance-inhibiting compared to male respondents (mean = 2.19, $p < .01$). Dressage riders (mean = 1.74) reported feeling more physical arousal before competitions than show jumpers (mean = 1.71). These results underline the importance of considering competition anxiety to adapt training for riders, minimize risks of injuries in equestrian sports, and improve performance. Results may also be of interest for selecting advice and coaching processes.

Keywords

Stress; equestrian sports; concentration (decrease); concern; somatic anxiety; coping

1. Introduction

Anxiety is accompanied by negative feelings of tension and is geared toward a threat in the future [1]. Since it occurs immediately and automatically as emotions, in contrast to cognitions [2], it can protect people from danger or actions with negative consequences. Conversely, anxiety, like stress, has evolved as a response pattern to better cope with

challenging situations [3] and thus get the best out of people. Anxiety plays an important role in almost all competitive sports. Competition anxiety can be protective as well as motivating [3]. Competitions are associated with stress and anxiety in athletes, which may affect their performance [4]. Thus, competition anxiety has already been examined in various sports, such as bowling [5], athletics [6], basketball

and volleyball [7], ice skating [8], golf [9], swimming [10], football and rugby [11] as well as tennis [12].

Competition anxiety [13] can be divided into state anxiety and trait anxiety. State anxiety consists of an emotional response (anxiety) caused by a particular competitive situation and by worries about not meeting others' expectations. Trait anxiety is considered a personality trait and influences how a competitive situation is perceived [14]. Furthermore, competition anxiety can be understood as a multidimensional construct [15]. Somatic anxiety refers to the physiological response to anxiety. In addition, anxiety manifests itself cognitively or through concentration problems [14]. Specifically for cognitive aspects, the individual experience of competition anxiety is oftentimes assessed using questionnaires. The validated *Wettkampf-Angst-Inventar* (WAI-T; Competition Anxiety Inventory Trait) [16], which is available in German, considers the subdivisions into state and trait anxiety as well as a multidimensional perspective of competition anxiety. Therefore, it was used in the present study.

Despite equestrian sport being of the most popular sports in Germany [17], there are only a few studies (with comparatively small numbers of participants). Horses are flight and prey animals. Thus, athletes expose themselves to additional dangers during competition and depend on their equine partner to perform optimally. Due to the severity of injuries and high mortality, horseback riding is considered a risky sport with numerous accidents reported [18–23]. Therefore, it is not surprising that equestrian sports are found to be anxiety-inducing [24]. It was reported that the perceived severity of horseback riding accidents and injuries correlates with cognitive and somatic competitive anxiety [25].

Unlike in many other sports, which are primarily about speed, strength, or precision and may use inanimate equipment, which is in this sense unresponsive, equestrians interact with their horses via non-verbal channels and view their horses with their individual characteristics and sensations as partners. Equestrians and horses need to work together in harmony to optimize not only their performance but also their welfare, health, and safety [26]. In equestrian sports, the interaction between rider and horse plays an important role, as animals can sense and react to human emotions [25,27]. Critically, it has been pointed out that riders' interpretations of horses' affective state are oftentimes misguided [28] and, hence, increases the risk of miscommunication and, consequently, of injuries. In addition, horses have been suggested to be able to sense their rider's fear and the rider's arousal can be transferred to horses as shown by heart rate measurements [29,30], potentially causing dangerous situations. Therefore, in this study, the extent of competition anxiety in equestrians was examined.

Increasing a rider's somatic arousal can also negatively impact horse-rider interaction and performance. Relaxed, confident riders should be able to execute correct movements to which the horse reacts appropriately. For equestrians who show symptoms of somatic arousal, it could be that previously trained signals are unclear, e.g., due to muscle tension or increased heart rate. This should lead to a decrease in performance. In advanced stages of equestrian sports, demands on the equestrian-horse dyad become more

sophisticated and require greater precision motor skills and better differentiation between the various aids [31]. For those riders who had a better assessment of their riding abilities and more training sessions, less nervousness was transferred to the respective horse [30]. Moreover, competition riders showed significantly higher values of self-efficacy and the assessment of their riding skills than recreational riders and, thus, had more confidence in their abilities. Those who considered themselves to be good riders also had higher self-efficacy values compared to riders who considered themselves less proficient. In addition, self-efficacy correlated with riding experience, the number of horses and, in the case of competition riders, the number of competitions [32]. That is, the performance depends to some extent on the interaction between rider and horse involving communication in both directions and psychological states such as self-efficacy or anxiety.

Investigating the interaction between horses and dressage riders using inertial sensors showed that the riding level influenced the rider's posture. Differences could be detected with contemporary available sensor technology and methods. Professional dressage riders and dressage beginners were examined during the study. Professional equestrians held their pelvis closer to the middle position and further forward whereas beginners tilted their pelvis further to the right and further back. The coupling intensity of the horse and rider showed differences between gaits. Although this study did not explore competition anxiety, differences between professionals and beginners were found [33]. Another study emphasized the importance of developing resilience, i.e., mental resistance, for competitive riders and suggested that developing performance strategies can help develop resilience. Overall, more significant correlations between performance strategies were demonstrated among professionals than among novices [34]. Regarding competition anxiety, Wolframm *et al.* [35] argued that pre-competition mood, i.e., competition anxiety, improves performance in advanced riders compared to novice riders because it presumably leads to higher processing efficiency and task-specific concentration in advanced riders. However, it must be emphasized that the associated study involved only 26 dressage riders and no riders from other disciplines. Another study investigating mood and psychological skills in $N = 54$ elite and sub-elite equestrian riders (disciplines: show jumping and dressage) found that elite riders scored higher in anxiety management than non-elite riders [36].

Equestrians with low levels of confidence have been shown to be more likely to feel unable to control their horse [37]. Self-confidence may therefore be an indicator of how well equestrians rate their control, which in turn may be associated with equestrian anxiety. These two constructs of self-confidence and particularly competition anxiety were investigated in another study. Therefore, pre-competition anxiety and self-confidence in 57 eventing equestrians (including dressage, show jumping, and cross-country) were analyzed. Respectively different disciplines identified the show-jumping phase as having the largest impact on somatic anxiety and cognitive anxiety. The participants' self-confidence was highest for the cross-country phase (which is often associated with the most dangerous phase) [38]. In the cross-country phase, equestrians need to trust in

themselves and their abilities to complete the course safely and successfully (in addition to their riding skills).

Regarding the psychological profile, Wolframm and Micklewright [39] investigated the effects of a six-week mental skills training on precompetitive anxiety and performance in non-elite equestrian dressage riders. Ten Dutch non-elite dressage riders who competed regularly in Dutch amateur levels (B = beginner, L = easy, M = medium, and Z = advanced) participated in that study [39]. Findings suggest that mental skills training has a positive effect on competitive dressage performance in non-elite equestrians. These findings illustrate the importance of studying competition anxiety in equestrians and deriving practical implications from the findings. Results of another study by Wolframm and Micklewright [31] showed lower somatic arousal and higher self-confidence in elite compared with non-elite riders ($N = 40$; $n_{\text{female}} = 28$, $n_{\text{dressage}} = 12$, $n_{\text{show jumping}} = 17$, and $n_{\text{eventing}} = 11$). Negative correlations between cognitive arousal and self-confidence were found among elite equestrians, non-elite equestrians, show jumpers, and female equestrians. According to another study, there were differences in self-efficacy in different riding disciplines. Eventers rated their confidence the highest, and recreational riders the lowest. Due to riding ability, show jumpers rated their riding competence the highest, and recreational riders rated their riding ability the lowest [32]. While most of the studies mentioned above had rather small sample sizes, interesting results were found. Nevertheless, the findings indicate further research possibilities. Since various psychological constructs were found to differ between equestrian performance classes and disciplines in these studies, these aspects are also part of the present study.

There are some studies in the field of competitive anxiety dealing with differences between females and males, but the findings are not consistent. Russell *et al.* [7] found a higher degree of cognitive and somatic anxiety in females before competitions. Male competitors exhibited higher levels of self-confidence and lower levels of cognitive anxiety than females [40]. Meta-analytic research revealed that the mean effect size for self-confidence on performance in males was greater than that in females, suggesting males generally exhibit greater self-confidence than females [41]. Fernandes *et al.* [42] found higher expression only for cognitive anxiety, while other results demonstrated higher expression of somatic anxiety and concentration problems in females [43]. In addition, Correia and Rosado [43] found higher general competitive anxiety for females. This finding, again, contrasts with the findings of Aşçi *et al.* [44], who showed no differences in either cognitive or somatic anxiety between males and females. Iungano *et al.* [34] studied 101 show jumpers and found that male and female riders used different performance strategies. Male riders seemed to use the "activation" strategy more often, which showed a positive correlation with resilience. In contrast, female riders more often use the "negative thinking" strategy, which correlates negatively with resilience. Furthermore, sex differences have received little attention in equestrian sports research, which has mostly focused on a small number of male riders (e.g., [31–33,38]). Therefore, the present study also aimed to add to the literature by investigating possible sex differences by investigating a larger sample of athletes.

Focusing on competition anxiety in riders is required to be better able to minimize risks and prevent accidents but also to

mentally strengthen individuals. It is also argued that anxiety can affect equestrian athletes who resume riding before they have psychologically recovered from a previous riding accident, affecting their own performance and that of their horse [45].

The present study investigated whether there are differences in competition anxiety among equestrians of different performance classes, and disciplines, and also whether there are sex differences. Differences would have implications for the psychological profile of athletes and may, hence, lead to consequences for practice, training procedures, and coaching. For example, athletes with higher trait anxiety may benefit from adequate coping strategies whereas athletes with lower trait anxiety may devote more cognitive resources to technical skills (motor control & interaction with the horse).

In the present study it was hypothesized that there are differences between male and female riders (hypothesis H1), equestrian disciplines (H2), and performance classes (H3) regarding competition anxiety. Furthermore, a negative correlation was expected between the assessment of one's own riding abilities and competition anxiety (H4). In addition, it should be investigated whether equestrians' values of competition anxiety were similar to those of the norm sample, which included other athletes, or whether there were differences. These hypotheses are derived to contribute to answering the following research questions: Are there differences between female equestrians' and male equestrians' competition anxiety? Do equestrians in various performance classes have different competition anxiety scores? Is competition anxiety found to be different in equestrians of various disciplines (dressage, show jumping, western, recreational, eventing)? Do equestrians who rate their own riding abilities lower than those who do not show higher competition anxiety scores? Do equestrians differ in their competitive anxiety scores from other athletes that belong to a norm sample?

2. Methods

2.1. Sample

A total of $N = 406$ competition riders participated in this study. Participants were 385 females (95%) and 21 males with a mean age of 34.84 ($SD = 11.18$) years. They were either horse owners ($n = 371$) and had $M = 2.27$ horses of their own ($SD = 2.42$) or did not own a horse but rode a foster horse or a school horse ($n = 35$). Participants were recruited via various platforms (social media, notices in riding stables, and universities). An online survey design was used (via "Unipark") over a period of eight weeks. Participants were able to withdraw from the study at any time. In accordance with the ethics code of the American Psychological Association and the ethical standards of the sixth revision of the guidelines of the Declaration of Helsinki [46], participants of the research were volunteers and gave their written informed consent. To protect human welfare, all applicable international, national, and/or institutional guidelines for human participants were followed. Institutional ethics was granted by the local

¹Recreational equestrians are respondents stating that they take part in competitions from time to time, but do not assign themselves to a specific discipline.

university (Hochschule Fresenius, University of Applied Sciences). Data were treated anonymously.

2.2. Design

A between-subjects design was used in which levels of competition anxiety were compared according to sex (male vs. female), discipline (dressage vs. show jumping vs. eventing vs. western vs. recreational riding), and performance class (2-7).

A standardized, German-language questionnaire with various subscales (see below) was used to measure competition anxiety, namely the Competition Anxiety Inventory Trait (WAI-T) [16], which is based on the Sport Anxiety Scale (SAS) by [47]. The WAI-T comprises 12 items, with four each belonging to the subscales of somatic anxiety, concern, and concentration (decrease) (four-point scale from "not at all" to "very much"). It is a psychometrically tested questionnaire with a structure corresponding to the SAS questionnaire. Three components of competition anxiety are assessed (somatic anxiety, concern, and concentration (decrease)). Somatic anxiety refers to the component of anxiety that is physically felt and associated with various signs of anxiety (palpitations, sweaty hands, queasy feeling in the stomach). This anxiety component includes athletes' propensity to have negative expectations, specific concerns, or self-doubt before a competition. The concentration (decrease) component is connected to being distracted by external influences during the ongoing competition (e.g., by spectator reactions). In addition to concern, this also includes the cognitive component of competition anxiety. Internal consistencies of the scales are generally $\alpha = .81$ for the somatic anxiety component, $\alpha = .83$ for concern scale, and $\alpha = .77$ for difficulty concentrating scale. Overall, these can be rated as satisfactory to good. In the present study, internal consistencies for both the somatic anxiety and concern components are $\alpha = .84$ and for concentration (decrease) scale $\alpha = .70$.

Additionally, there are two items in the questionnaire not related to the three sub-constructs. Employing these questions, the extent to which physical arousal on the one hand, and worrying thoughts on the other hand are perceived as performance-inhibiting vs. performance-enhancing is assessed. In addition to demographic variables, respondents were also asked whether they participate in horse shows (filter question) and if so, how many usually (prior to the COVID-19 pandemic), how many years of riding experience they have, which discipline they primarily belong to (e.g., dressage, show jumping, western, eventing) and which performance class they are in (7 = lowest, 1 = highest). Furthermore, participants were asked to state whether they had already experienced a critical situation or a loss of control with the horse and to what extent they considered themselves good riders.

2.3. Data Analysis

Items belonging to each of the three subscales were averaged for further calculations. One-way ANOVA tests were used to examine differences in equestrian disciplines and performance classes. Post-hoc paired-sample *t*-tests were performed using a Bonferroni corrected alpha level

of 0.05 to indicate statistical significance. A *t*-test was used to analyze sex differences. Pearson's correlations tests were conducted between each of the WAI-T subscales according to equestrians' riding experience (in years), number of own horses, number of horse shows (per year), age, and riding expertise (self-assessment). Scores within this sample were compared to those of the norm sample by [16]. An α level of 0.05 was used to indicate statistical significance. Effect sizes were interpreted using Cohen's guidelines [48]. Eta squared values were consequently interpreted as follows: .01 = small effect, .06 = moderate effect, and .14 = large effect. Statistical analyses were conducted using SPSS 28.

3. Results

For this study, 406 competition riders were recruited (95% female, $M_{\text{age}} = 34.84$, $SD = 11.18$). Percentages of equestrian disciplines and performance classes can be found in Figures 1 and 2.

Participants had an average of $M = 25.15$ years ($SD = 10.70$) of riding experience. They took part in $M = 9.72$ ($SD = 7.73$) shows per year. Most respondents stated an experience of a critical (dangerous) situation ($n = 370$, 91.1%) and a loss of control with the horse ($n = 353$, 86.9%). For the three sub-constructs, whose values were derived from the sum scores of the respective items, a value of $M = 10.13$ ($SD = 3.12$) was found for somatic anxiety, $M = 10.21$ ($SD = 3.15$) for experience of concerns and $M = 7.27$ ($SD = 2.67$) for concentration (decrease). The normative sample refers to 414 athletes. These include 169 female (40.8% of the sample) and 245 male (59.2% of the sample) athletes from different sports and different performance levels [16]. Descriptive statistics can be found in Tables 1, 2, and 3.

Female and male riders' values were above those of the norm sample of [16]. There were no significant differences between male and female riders for the three sub-constructs. However, analyzing the items on competition anxiety (the extent to which physical arousal and worrying thoughts are perceived as performance-inhibiting vs. -enhancing) revealed a significant difference in worrying thoughts before a competition between male and female riders with a moderate effect size, $t(404) = -2.91$, $p < .01$, Cohen's $d = -.62$. Female participants ($M = 1.71$, $SD = .74$, $n = 385$) were more likely to rate worrying thoughts as inhibiting performance compared to male participants ($M = 2.19$, $SD = .81$, $n = 21$). Compared to female and male respondents of the norm sample, participants' scores with regard to the three subcomponents are shown in Table 1.

Between the most frequently mentioned disciplines (dressage, show jumping, western, recreational, eventing), a univariate analysis of variance revealed significant differences for the concern component with a small effect, $F(5, 400) = 3.60$, $p < .01$, $\eta^2 = .04$, and for the concentration (decrease) subconstruct with moderate effect size, $F(5, 400) = 4.79$, $p < .001$, $\eta^2 = .06$. Post-hoc tests showed that differences in concern were between the dressage ($M = 10.67$, $SD = 3.18$, $n = 209$) and western ($M = 7.90$, $SD = 2.60$, $n = 7$) disciplines. Dressage riders showed higher concern scores than western riders.

Table 1: Descriptive results of investigated sample and normative sample.

	Study				Normative sample			
	Female equestrians		Male equestrians		Women		Men	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Somatic anxiety	10.19	3.14	9.05	2.64	9.16	2.75	7.91	2.33
Concerns	10.24	3.12	9.62	2.77	9.06	2.70	7.64	2.34
Concentration (decrease)	7.28	2.70	7.10	2.23	6.39	2.32	6.09	2.10

Note: *M* = Mean; *SD* = Standard Deviation

■ Dressage ■ Jumping ■ Recreational ■ Eventing ■ Western ■ Others

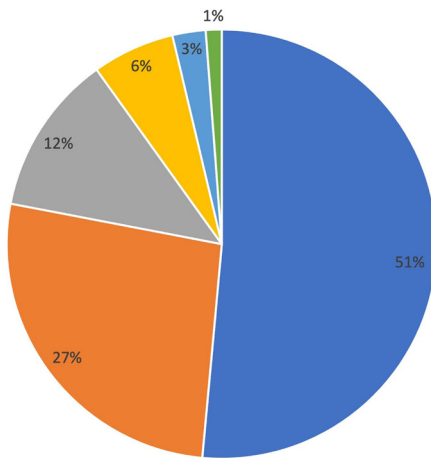


Figure 1: Divisions of the equestrian disciplines.

■ 5 ■ 4 ■ 3 ■ 6 ■ 2 ■ 1 ■ 7 ■ no class

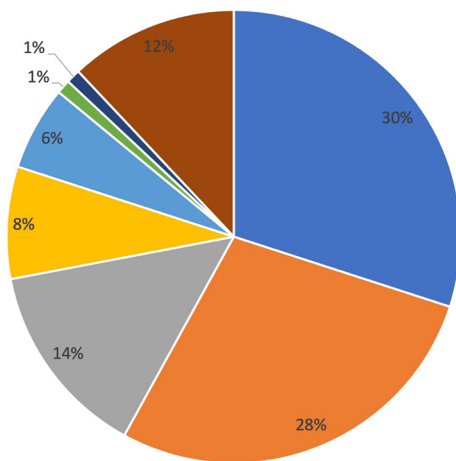


Figure 2: Divisions of the equestrian performance classes (7 = lowest, 1 = highest).

For concentration (decrease), differences were found between dressage ($M = 7.57$, $SD = 2.68$, $n = 209$) vs. show jumping ($M = 6.69$, $SD = 2.34$, $n = 108$) vs. eventing ($M = 5.76$, $SD = 2.42$, $n = 25$) and between show jumping vs. recreational riding ($M = 8.22$, $SD = 2.95$, $n = 49$). Consequently, dressage riders reported having greater difficulties with concentration than show jumpers and eventers, who reported this component

as the least pronounced. In addition, recreational riders reported having far more difficulties with concentration than show jumpers.

Both of the other items related to competitive anxiety were also examined in individual disciplines. A significant result between the groups was found for physically felt arousal before a competition with a small effect size, $F(5, 400) = 2.53$, $p < .05$, $\eta^2 = .03$. Post-hoc tests yielded a difference between show jumpers ($M = 1.71$, $SD = .75$, $n = 108$) and dressage riders ($M = 1.74$, $SD = .75$, $n = 209$). Dressage riders reported feeling more physically perceived arousal before competitions than show jumpers.

Due to unequal sex distribution, a further calculation was conducted exclusively based on the female riders' data ($n = 385$). Similar results were found here. For the concern component, there was a significant result $F(5, 379) = 3.68$, $p < .01$, $\eta^2 = .05$, as well as for concentration (decrease), $F(5, 379) = 4.89$, $p < .001$, $\eta^2 = .06$. Post-hoc test results showed similar values as in the first calculation including male respondents (higher concern scores in dressage riders vs. western riders; higher concentration (decrease) scores in dressage riders vs. show jumpers vs. eventers; higher concentration (decrease) scores in recreational riders vs. show jumpers). In contrast, for the concern component, the difference between respondents of the disciplines dressage and western was not significant. For physically perceptible arousal before competitions, there was a non-significant result without the male riders' data, $F(5, 379) = 2.19$, $p = .054$ (higher scores in dressage riders vs. show jumpers).

In relation to different performance classes, a further ANOVA showed a significant difference in somatic anxiety with moderate effect size, $F(7, 398) = 3.86$, $p < .001$, $\eta^2 = .06$. The post-hoc test yielded differences between respondents in performance class 6 ($M = 11.76$, $SD = 2.63$, $n = 34$) compared to riders in performance classes 4 ($M = 9.79$, $SD = 2.93$, $n = 114$), 3 ($M = 9.13$, $SD = 2.95$, $n = 56$) and 2 ($M = 8.70$, $SD = 3.31$, $n = 23$). Equestrians having a lower-performance class showed higher somatic anxiety than those in higher performance classes.

There were no significant results regarding any other sub-constructs. Due to unequal sex distribution, only the female equestrian data was used to test the third hypothesis. Similar results were found here. For somatic anxiety, a significant result was obtained $F(7, 377) = 3.41$, $p < .001$, $\eta^2 = .06$. Post-hoc tests showed similar values as in the first calculation including male respondents (higher scores in equestrians with better performance classes).

Table 2: Descriptive results of disciplines.

	Constructs					
	Somatic anxiety		Concerns		Concentration (decrease)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dressage	10.20	3.16	10.67	3.18	7.57	2.68
Show jumping	9.74	3.18	9.73	2.96	6.69	2.34
Western	10.30	3.40	7.90	2.60	6.70	2.54
Recreational	11.06	2.74	10.40	2.91	8.22	2.95
Eventing	9.56	2.83	9.44	3.65	5.76	2.42

Note: *M* = Mean; *SD* = Standard Deviation

Weak, negative correlations were also found between the assessment of one's own riding expertise and the three sub-constructs of somatic anxiety ($r = -.13, p < .01$), concern ($r = -.22, p < .01$), and concentration (decrease) ($r = -.13, p < .05$). Equestrians having lower self-evaluations had higher anxiety scores. In addition, correlations were found between the scales examined, as can be seen in **Table 4**.

4. Discussion

The purpose of the present study was to investigate differences in competition anxiety among riders of various performance levels, disciplines, and sexes. New insights into the distribution of competition anxiety among riders in Germany were gained. These findings have theoretical and practical implications. Subcomponents of somatic anxiety, concern, and concentration (decrease) were found to be more pronounced in equestrians than in the normative sample [16]. Participants analyzed in the normative sample were non-equestrian athletes. In support of our hypotheses, equestrians might show higher competition anxiety scores than non-equestrian athletes due to higher potential risks associated with riding horses [18–20,22,23].

In accordance with our hypothesis, female and male equestrians differed in worrying thoughts before competitions. This was one of the two additional questions in the questionnaire (WAI-T) that are not part of the three subcomponents (somatic anxiety, concern, and concentration (decrease)). Female respondents were more likely to rate worrying thoughts as inhibiting performance compared to male respondents. This result is in line with findings on sex differences in competition anxiety, including differences between female and male athletes [7,42,43]. Greater self-confidence scores in men than in women might be another explanation. However, the subcomponents of competition anxiety did not yield an (expected) difference between female and male equestrians. Aşçi *et al.* [44] reported no sex differences in either cognitive or somatic anxiety. As in other studies (e.g., [31–33,38]) the small number of male equestrians participating in the present study must be taken into account. Although this distribution is ecologically valid (the distribution of the sexes is in accordance with the rider population in German-speaking countries), the reason why no sex differences were found needs to be established by future research.

Importantly, there were significant differences among disciplines for components of concern and concentration (decrease), but not for somatic anxiety. Concern and

concentration are mental aspects and they correlated with each other. Somatic anxiety involves physical aspects that are often related to mental dimensions, but obviously not always. Thus, a higher level of concern was associated with a higher decrease in concentration. Here, dressage riders reported being more anxious before horse shows than western riders. Concentration (decrease) was also significantly higher for dressage riders – in comparison to show-jumping riders and eventers, who had the lowest scores of all disciplines. In addition to dressage and show-jumping competitions, eventing competitions also include cross-country competitions, which represent an additional challenge and may require more courage because of the partially high obstacles and the higher speed. An assumption might be that fearful riders do not belong to these disciplines, but rather more courageous riders with less fear or those who have more self-confidence. Consistently, event riders showed better concentration performance as indicated by low values in concentration (decrease). Further differences related to riders in show jumping and recreational riding, with show jumpers having significantly lower scores.

Another difference was found in the reported physically noticeable arousal between dressage riders and show jumpers; arousal was higher for dressage riders. Schütz [32] also found the highest self-evaluation of self-efficacy among eventers compared to equestrians in other disciplines. In the same study, show-jumping riders rated their riding abilities highest. Dressage riders rated themselves as less self-efficacious and less good at riding. These findings could be used to explain the results of the present study. In this context, another study can also be referred to, which only focused on eventers [38]. The show-jumping phase had the largest impact on somatic anxiety and cognitive anxiety. The cross-country phase had the highest self-confidence mean score. Competition anxiety is thus also among eventers (as in the present study), but there is a lack of comparative possibilities with riders of other disciplines to be able to classify the equestrians interviewed by McGinn *et al.* with regard to their anxiety. The previous study can also be considered, at least to a limited extent, as an explanation of the present results, even though only show jumpers were examined here and therefore no differences between the disciplines could be focused on. Wolfram and Micklewright [39] investigated the effects of mental training on dressage riders. They did not give any reasons why they did not include equestrians from other disciplines in the study. This research could also serve as an explanation for the findings in the present study.

Table 3: Descriptive results of performance classes (7 = lowest, 1 = highest).

	Constructs					
	Somatic anxiety		Concerns		Concentration (decrease)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance class 1	8.75	2.99	10.75	1.26	9.25	3.40
Performance class 2	8.70	3.31	9.09	3.81	6.43	2.17
Performance class 3	9.13	2.95	9.54	2.64	7.11	2.51
Performance class 4	9.79	2.93	10.16	3.20	7.10	2.61
Performance class 5	10.54	3.16	10.45	3.29	7.23	2.68
Performance class 6	11.76	2.63	11.21	2.95	8.15	3.00
Performance class 7	11.00	2.94	11.00	2.16	6.50	1.91

Note: *M* = Mean; *SD* = Standard Deviation

Regarding the performance classes, a significant difference in somatic anxiety was recorded. Equestrians with the lower-performance class 6 had higher somatic anxiety than respondents with the higher performance classes 4, 3, and 2 (with no further differentiation among classes 4, 3, & 2). This could be attributed, for example, to less experience and routine in competitive sports for riders in lower-performance classes. Less experience can result in greater arousal. Based on more riding experience, badges in competitive sports as well as successes, higher-performance classes could be reached. This perspective is in accordance with findings by [35], who suggest advanced riders have a better mood and thus less competition anxiety compared to novice riders. Experience and success may in turn be associated with higher self-efficacy and lower anxiety. There might also be an interaction between somatic fear, fine muscle control of a rider, and communication between horse and rider. Horses already sense small changes in the rider's posture [33], for example, when the equestrian changes the muscle tension in a minimal way.

Similarly, riders who assessed their riding abilities better and trained more transferred less nervousness to their horse [30].

They were therefore also less nervous overall [30]. Münz *et al.* [33] found the equestrian level influenced the rider's posture. Professional dressage riders had a different (more efficient) posture compared to novice riders. This may have a positive or negative effect on the interaction with the horse and may be associated with less fear in professional equestrians with better posture. Beauchamp and Whinton [37] found equestrians with low levels of confidence to be more likely to feel unable to control their horse. This may be associated with higher anxiety. Meyers *et al.* [36] found elite riders score higher in anxiety management than non-elite riders, which is consistent with the present results. In addition to equestrians, their horses should also be taken into account. Most horses showing at higher levels probably also have more show experience than those horses competing at lower levels. Therefore, horses competing at lower levels may be more nervous, which could negatively impact their (probably) less experienced riders (increased rider anxiety).

Table 4: Correlations of the subcomponents of competition anxiety (1) with other variables (2-8).

	1	2	3	4	5	6	7
1 Somatic anxiety	-						
2 Concern	.60**	-					
3 Concentration (decrease)	.40**	.49**	-				
4 Riding experience (years)	-.13**	-.21**	-.04	-			
5 Number of own horses	-.18**	-.17**	-.07	.16**	-		
6 Number of horse shows	-.23**	-.07	-.13**	-.05	.28**	-	
7 Age	-.08	-.15**	.02	.84**	.13*	-.01	-
8 Riding expertise	-.13**	-.22**	-.13*	.16**	.05	.10*	-.01

Note: ** $p < .01$, * $p < .05$

4.1. Limitations

Although the sex distribution in the present sample corresponded to the sex distribution in equestrian sports, the comparatively low number of male respondents should be noted. In 2020, the proportion of women in competitive sports was around 87%. Similarly, most members (79%) of the German Equestrian Federation (FN, 2020) were female ($n = 539,607$). The distribution of horses by sex in 2019 also shows this trend (87% female; FN, 2020). It should be considered this study's results are primarily based on data from female equestrians and therefore cannot be simply extrapolated to male equestrians. Similarly, among males aged 14 and over, 0.32 million owned at least one horse; among females, the figure was twice as high at 0.64 million [49]. Furthermore, we would like to note that comparatively few female and male western riders participated in the study.

4.2. Directions for Future Research and Implications for Practice

In follow-up studies, aspects mentioned in the limitation section should be further considered, for example, a greater number of participants with respective subgroups regarding disciplines, performance classes, and sex distribution. In addition, the human-horse relationship and other facets of riding and riding skills should be included. It could also be investigated to what extent the respondents have already actively worked on their competition anxiety and whether this was effective. Furthermore, besides the characteristics of equestrians in competitions, attributes of horses could also be investigated, such as the horses' sex [50].

In this context, longitudinal studies would be informative in addition to experimental designs. An experimental group could receive a treatment such as special anti-anxiety training and could be compared with a control group without treatment over a longer period of time with several measurement points.

People who did not participate in horse competitions were not included in this study. For them, a construct to be investigated would therefore not be competition anxiety, but riding anxiety as such. Nevertheless, it would be interesting to investigate to what extent they have a fear of riding per se - also in direct comparison with those who participate in competitions. Furthermore, a comparison between different sports in terms of fear of competition and related injuries would provide further insight. It could also be investigated to what extent fear plays a central role in human-horse interaction and the actual successes at horse shows. Dressage riders in particular were more anxious before competitions and had more concentration problems. For this reason, it is particularly advisable for female dressage riders to work on their anxiety and concentration problems. One possibility is mental training, which can be integrated into regular training and is associated with performance increases for dressage riders [39]. Wolfram and Micklewright [39] argued that improving mental skills like goal-setting or self-talk may reduce distracting thoughts and could be an explanation of better performance. Future research should also investigate the effect of levels of cognitive and somatic arousal on competitive

performance, including the potentially moderating variable of self-confidence, as stated by Brand et al. [31].

Differences found between disciplines could serve as a basis for specific training to specifically promote riders depending on the discipline. The results of the present study could also be passed on to riding coaches so that they can adapt their riding lessons accordingly. Focusing on the mental states of riders could also have a positive impact on competition success and training to control one's emotions and develop coping strategies. Further on, a discipline-specific, psychological profile (incl. competition anxiety) could also be included in the selection and promotion of squad members.

In practice, equestrians could be targeted by psychological profiling to identify personal risks, derive recommendations for appropriate disciplines, and design suitable opportunities for support. If equestrians, coaches, or support staff are better educated about the underlying causes of their fear and ways to improve coping processes, they can benefit not only regarding the personal experience of fear but also in terms of the interaction between humans and horses. Thus, the human-horse bond could be strengthened, which could prevent accidents. Besides risk minimization, the connection to this sport could also be increased. McGinn et al. [38] also refer to the idea of coaches or sports psychologists considering how to help equestrians manage their level of arousal according to the competition phase. For example, coping strategies can be developed and promoted to improve self-awareness. Consequently, arousal can have an optimal influence on the equestrian's performance. As a result, communication between horses and equestrians can be improved.

5. Conclusion

The present findings call for further research on (competitive) anxiety in equestrian athletes, which is increasingly being investigated but less so as in other sports. Specific differences among sexes and disciplines are reported and should be taken into account as critical aspects of an optimal psychological profile. These findings are relevant for athletes and professionals who aim for optimal (mental) training, competition preparation, and risk reduction in equestrian sports.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Conflicts of Interest

The authors declare that they have no conflict of interest.

Ethical Approval

In accordance with the ethics code of the American Psychological Association and the ethical standards of the sixth revision of the guidelines of the Declaration of Helsinki [46], participants of the research were volunteers and gave their written informed consent. In order to protect human welfare all applicable international, national, and/or institutional guidelines for human participants were followed,

and institutional ethics was granted by the local university. Data were treated anonymously.

References

- [1] Becker E. *Angst*. München: Ernst Reinhardt; 2011.
- [2] Betsch T, Funke J, Plessner H. [On the role of emotions in decisions]. In: Betsch T, Funke J, Plessner H, editors. [Thinking – judging, deciding, problem solving], Heidelberg: Springer; 2011, p. 123–34.
- [3] Nesse RM. Evolutionary explanations of emotions. *Human Nature* (Hawthorne, NY) 1990;1. <https://doi.org/10.1007/BF02733986>.
- [4] Ford JL, Ildefonso K, Jones ML, Aryinen-Barrow M. Sport-related anxiety: current insights. *OAJSM* 2017;8:205–12. <https://doi.org/10.2147/OAJSM.S125845>.
- [5] Woodman T, Albinson JG, Hardy L. An investigation of the zones of optimal functioning hypothesis within a multidimensional framework. *Journal of Sport and Exercise Psychology* 1997;19:131–41. <https://doi.org/10.1123/jsep.19.2.131>.
- [6] Gould D, Tuffey S, Hardy L, Lochbaum M. Multidimensional state anxiety and middle distance running performance: An exploratory examination of Hanin's (1980) zones of optimal functioning hypothesis. *Journal of Applied Sport Psychology* 1993;5:85–94. <https://doi.org/10.1080/10413209308411307>.
- [7] Russell WD, Robb M, Cox RH. Sex, sport, situation, and competitive state anxiety. *Percept Mot Skills* 1998;86:816–8. <https://doi.org/10.2466/pms.1998.86.3.816>.
- [8] Martin KA, Hall CR. Situational and intrapersonal moderators of sport competition state anxiety. *Journal of Sport Behavior* 1997;20:435–47.
- [9] Moore LJ, Wilson MR, Vine SJ, Coussens AH, Freeman P. Champ or chump?: Challenge and threat states during pressurized competition. *Journal of Sport and Exercise Psychology* 2013;35:551–62. <https://doi.org/10.1123/jsep.35.6.551>.
- [10] Burton D. Do anxious swimmers swim slower? Reexamining the elusive anxiety-performance relationship. *Journal of Sport & Exercise Psychology* 1988;10:45–61. <https://doi.org/10.1123/jsep.10.1.45>.
- [11] Lavallée L, Flint F. The Relationship of Stress, Competitive Anxiety, Mood State, and Social Support to Athletic Injury. *Journal of Athletic Training* 1996;31:296.
- [12] Hoja S, Jansen P. Mindfulness-based intervention for tennis players: a quasi-experimental pilot study. *BMJ Open Sport & Exercise Medicine* 2019;5:e000584. <https://doi.org/10.1136/bmjsem-2019-000584>.
- [13] Ehrlenspiel F, Graf K, Kühn C, Brand R. [Stability and variability from competition anxiety]. *Zeitschrift Für Sportpsychologie* 2011;18:31–43. <https://doi.org/10.1026/1612-5010/a000034>.
- [14] Patel DR, Omar H, Terry M. Sport-related performance anxiety in young female athletes. *Journal of Pediatric and Adolescent Gynecology* 2010;23:325–35. <https://doi.org/10.1016/j.jpjg.2010.04.004>.
- [15] Cheng W-NK, Hardy L, Markland D. Toward a three-dimensional conceptualization of performance anxiety: Rationale and initial measurement development. *Psychology of Sport and Exercise* 2009;10:271–8. <https://doi.org/10.1016/j.psychsport.2008.08.001>.
- [16] Brand R, Ehrlenspiel F, Graf K. [Competitive Anxiety Inventory. Manual for comprehensive initial diagnostics of competition anxiety, competition anxiety and anxiety management mode in sport]. Köln: Sportverlag Strauß; 2009.
- [17] [Most popular types of sport in Germany from 2019 to 2021, based on the population's interest in sport]. IfD Allensbach 2022. <https://de.statista.com/statistik/daten/studie/171072/umfrage/sportarten-fuer-die-besonderes-interesse-besteht/> (accessed November 16, 2022).
- [18] Bentley T, Page S, Meyer D, Chalmers D, Laird I. How safe is adventure tourism in New Zealand? An exploratory analysis. *Applied Ergonomics* 2001;32:327–38. [https://doi.org/10.1016/S0003-6870\(01\)00011-4](https://doi.org/10.1016/S0003-6870(01)00011-4).
- [19] Fleischer L, Faschingbauer M, Seide K, Kienast B. [Injury patterns in riding accidents]. *Dtsch Z Sportmed* 2016;2016:270–5. <https://doi.org/10.5960/dzsm.2016.249>.
- [20] Heitkamp H-C, Horstmann T, Hillgeris D. Riding and handling injuries in experienced riders. *Unfallchirurg* 1998;101:122–8. <https://doi.org/10.1007/s001130050244>.
- [21] Schröter C, Schulte-Sutum A, Zeckey C, Winkelmann M, Krettek C, Mommsen P. [Equestrian accidents]. *Unfallchirurg* 2017;120:129–38. <https://doi.org/10.1007/s00113-015-0074-z>.
- [22] Sorli JM. Equestrian injuries: a five year review of hospital admissions in British Columbia, Canada. *Inj Prev* 2000;6:59–61. <https://doi.org/10.1136/ip.6.1.59>.
- [23] Wallin L, Strandberg E, Philipsson J, Dalin G. Estimates of longevity and causes of culling and death in Swedish warmblood and coldblood horses. *Livestock Production Science* 2000;63:275–89. [https://doi.org/10.1016/S0301-6226\(99\)00126-8](https://doi.org/10.1016/S0301-6226(99)00126-8).
- [24] Tenenbaum G, Lloyd M, Pretty G, Hanin YL. Congruence of actual and retrospective reports of precompetition emotions in equestrians. *Journal of Sport and Exercise Psychology* 2002;24:271–88. <https://doi.org/10.1123/jsep.24.3.271>.
- [25] Gomolla A. [Psychotherapy: Horses have a mirror function]. *Deutsches Ärzteblatt* 2014;12:356–7.
- [26] McGreevy PD. The advent of equitation science. *The Veterinary Journal* 2007;174:492–500. <https://doi.org/10.1016/j.tvjl.2006.09.008>.
- [27] Smith AV, Proops L, Grounds K, Wathan J, McComb K. Functionally relevant responses to human facial expressions of emotion in the domestic horse (*Equus caballus*). *Biology Letters* 2016;12:20150907. <https://doi.org/10.1098/rsbl.2015.0907>.
- [28] Bornmann T, Randle H, Williams J. Investigating equestrians' perceptions of horse happiness: an exploratory study. *Journal of Equine Veterinary Science* 2021;104:103697. <https://doi.org/10.1016/j.jevs.2021.103697>.
- [29] Keeling LJ, Jonare L, Lanneborn L. Investigating horse-human interactions: The effect of a nervous human. *The Veterinary Journal* 2009;181:70–1. <https://doi.org/10.1016/j.tvjl.2009.03.013>.
- [30] von Borstel UU, Duncan IJH, Shoveller AK, Millman ST, Keeling LJ. Transfer of nervousness from competition rider to the horse. the Conference Proceedings 3rd International Equitation Science Conference, East Lansing: Michigan State University, MI USA; 2007.
- [31] Wolfram I, Micklewright D. Pre-competitive levels of arousal and self-confidence among elite and non-elite equestrian

- riders. *Comparative Exercise Physiology* 2008;5:153–9. <https://doi.org/10.1017/S1478061509356133>.
- [32] Schütz K. [Believe in yourself and your horse! Expectations of self-efficacy and assessment of riding competence among riders]. *Zeitschrift Für Psychologie Im Reitsport* 2021;1–10.
- [33] Münz A, Eckardt F, Witte K. Horse–rider interaction in dressage riding. *Human Movement Science* 2014;33:227–37. <https://doi.org/10.1016/j.humov.2013.09.003>.
- [34] Iungano HM, Lancaster BE, Wolfram I. Relationship between performance strategies, resilience qualities, riding experience and competitive performance of show jumping riders. *Comparative Exercise Physiology* 2019;15:69–76. <https://doi.org/10.3920/CEP180019>.
- [35] Wolfram IA, Shearman J, Micklewright D. A preliminary investigation into pre-competitive mood states of advanced and novice equestrian dressage riders. *Journal of Applied Sport Psychology* 2010;22:333–42. <https://doi.org/10.1080/10413200.2010.485544>.
- [36] Meyers M, Bourgeois A, Leunes A, Murray N. Mood and psychological skills of elite and sub-elite equestrian athletes. *Journal of Sport Behavior* 1999;22:399–409.
- [37] Beauchamp M, Whinton L. Self-efficacy and other-efficacy in dyadic performance: riding as one in equestrian eventing. *Annual Conference of the British-Psychological-Society* 2005;27:245–52. <https://doi.org/10.1123/jsep.27.2.245>.
- [38] McGinn S, Alcock D, Cameron L.j. A retrospective investigation of the impact of ‘eventing phase (dressage, show-jumping and cross-country)’ on pre-competition anxiety and self-confidence. *Comparative Exercise Physiology* 2019;15:269–81. <https://doi.org/10.3920/CEP190007>.
- [39] Wolfram IA, Micklewright D. The effect of a mental training program on state anxiety and competitive dressage performance. *Journal of Veterinary Behavior* 2011;6:267–75. <https://doi.org/10.1016/j.jveb.2011.03.003>.
- [40] Jones G, Swain A, Cale A. Gender differences in precompetition temporal patterning and antecedents of anxiety and self-confidence. *Journal of Sport & Exercise Psychology* 1991;13:1–15.
- [41] Woodman T, Hardy L. The relative impact of cognitive anxiety and self-confidence upon sport performance: a meta-analysis. *Journal of Sports Sciences* 2003;21. <https://doi.org/10.1080/0264041031000101809>.
- [42] Fernandes MG, Nunes SAN, Raposo JV, Fernandes HM. Factors influencing competitive anxiety in Brazilian athletes. *Brazilian Journal of Kinanthropometry and Human Performance* 2013;15:705–14. <https://doi.org/10.1590/1980-0037.2013v15n6p705>.
- [43] Correia ME, Rosado A. Anxiety in athletes: Gender and type of sport differences. *International Journal of Psychological Research* 2019;12:9–17. <https://doi.org/10.21500/20112084.3552>.
- [44] Aşçi FH, Koca C, Demirhan G, Dinç SC. Precompetitive anxiety and affective state of climbers in indoor climbing competition. *Percept Mot Skills* 2006;102:395–404. <https://doi.org/10.2466/pms.102.2.395-404>.
- [45] Hogg RC, Hodgins GA. The relationship between trait anxiety, trait competitive anxiety, riding experience, accident/injury status, and state competitive anxiety for equestrian athletes. *Journal of Veterinary Behavior* 2010;5:211–2. <https://doi.org/10.1016/j.jveb.2009.11.011>.
- [46] World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for Medical Research involving human subjects. *JAMA* 2013;310:2191–4. <https://doi.org/10.1001/jama.2013.281053>.
- [47] Smith RE, Smoll FL, Schutz RW. Measurement and correlates of sport-specific cognitive and somatic trait anxiety: The sport anxiety scale. *Anxiety Research* 1990;2:263–80. <https://doi.org/10.1080/08917779008248733>.
- [48] Cohen J. *Statistical power analysis for the behavioral sciences*. Hillsdale: NJ: Erlbaum; 1988.
- [49] Number of people who personally own a horse by gender in 2019. Statista 2019. <https://de.statista.com/statistik/daten/studie/959897/umfrage/umfrage-in-deutschland-zum-persoennlichen-besitz-eines-pferdes-nach-geschlecht> (accessed November 16, 2023).
- [50] Whitaker TC, Olusola O, Redwin L. The influence of horse gender on eventing competition performance. *Comparative Exercise Physiology* 2008;5:67–72. <https://doi.org/10.1017/S1478061508017039>.

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