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Chivalric Disposition and Attitudes to Sports Injuries: Combat Athletes and their Battle Scars

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Abstract

This study explores uptake of chivalrous values and potential interactions it may have with athletes' attitudes towards injury. It focuses more specifically on combat sports that historically align with notions of chivalry and chivalric ideals. Adopting a novel conceptualization of chivalric disposition as a value-complex subject to cultural evolutionary principles, a sample of 81 Maltese athletes, balanced between combative and non-combative disciplines, was surveyed using bespoke scales to measure chivalric disposition and positive injury perception. The findings of an inferential statistical analysis revealed that while subscribing to chivalrous values appears to be ubiquitous among athletes regardless of gender or type of sport, traditional martial arts practitioners may do so to a slightly higher degree. The main finding was a modest but statistically significant correlation between chivalric disposition and positive attitudes toward injury. Combat athletes displayed significantly more positive injury perception, consistent with valorisation of injuries as badges of honour in this particular culture. Various interpretations of the findings are given from both critical sociological and positive psychological perspectives. In terms of gender, the findings show that men and women exhibit similar levels of commitment to chivalrous values, yet, positive attitudes toward injury appears to be uniquely masculine. Intrasexual competition strategies are proposed as a viable explanation in this respect. Avenues for future research are proposed with a view to continuing to develop a deeper understanding of chivalric disposition as a novel construct of interest for researchers in the social sciences, as well as those interested more specifically in the psycho-social aspects of competitive sport.

Keywords: Chivalric disposition, athlete psychology, injury perception, combat sports, cultural evolution

Şövalyevari Eğilim ve Spor Yaralanmalarına Yönelik Tutumlar: Dövüş Sporcuları ve Savaş İzleri

Özet

Bu çalışma, şövalyevari değerlerin benimsenmesini ve bu değerlerin sporcuların yaralanmalara yönelik tutumlarıyla olası etkileşimlerini incelemektedir. Araştırma, tarihsel olarak şövalyelik ve şövalye idealleriyle ilişkilendirilen dövüş sporlarına daha özel bir odaklanma sunmaktadır. Şövalyevari eğilim, kültürel evrimsel ilkelerle şekillenen bir değer kompleksi olarak yenilikçi bir şekilde kavramsallaştırılmış ve dövüş sporları ile dövüş dışı disiplinlerden eşit sayıda (81 kişilik) Maltalı sporcu örneklemi üzerinde çalışılmıştır. Katılımcıların şövalyevari eğilimlerini ve yaralanmalara yönelik olumlu algılarını ölçmek için özel olarak tasarlanmış ölçekler kullanılmıştır. Çıkarımsal istatistiksel analiz sonuçları, şövalyevari değerlere bağlılığın cinsiyet veya spor türünden bağımsız olarak sporcular arasında yaygın olduğunu, ancak geleneksel dövüş sanatlarıyla uğraşanların bu değerlere biraz daha yüksek bir düzeyde bağlılık gösterebileceğini ortaya koymuştur. Çalışmanın temel bulgusu, şövalyevari eğilim ile yaralanmalara yönelik olumlu tutum arasında mütevazı ancak istatistiksel olarak anlamlı bir korelasyonun varlığıdır. Dövüş sporcuları, bu kültürde yaralanmaların birer onur nişanı olarak yüceltilmesiyle tutarlı bir şekilde, yaralanmalara yönelik daha olumlu bir algı sergilemiştir. Bulgular, eleştirel sosyolojik ve olumlu psikolojik perspektiflerden çeşitli şekillerde yorumlanmıştır. Cinsiyet açısından, erkekler ve kadınların şövalyevari değerlere benzer düzeyde bağlılık gösterdiği, ancak yaralanmalara yönelik olumlu tutumun benzersiz bir şekilde erkeklere özgü olduğu görülmüştür. Bu bağlamda, cinsiyet içi rekabet stratejileri olası bir açıklama olarak önerilmektedir. Gelecekteki araştırmalar için, şövalyevari eğilimin sosyal bilimler araştırmacıları ve rekabetçi sporun psiko-sosyal yönleriyle daha özel olarak ilgilenenler için ilgi çekici bir kavram olarak daha derinlemesine anlaşılmasını sağlamak amacıyla çeşitli araştırma yolları önerilmektedir.

Anahtar Kelimeler: Şövalyevari eğilim, sporcu psikolojisi, yaralanma algısı, dövüş sporları, kültürel evrim

Introduction

The assumption that athletes can be differentiated from other populations on the basis of some unique psychological characteristics, has garnered sufficient interest among researchers to foster the development of a body of literature dedicated to thoroughly probing the inner worlds of our sporting heroes. That the term "heroes" can even be used aptly here, is telling. Heroes are, by definition, those among us who are worthy of admiration, typically by virtue of great courage and accomplishments. The status of athletes as legitimate heroes has, in this sense, remained relatively secure at least since classical Greece. The fundamental categories of citizenry, soldiering, and Olympic competition (Loy & Morford, 2019) provide a framework for recognising acts that are sufficiently great or admirable, for classic as well as modern-day Olympians to mobilise those unique psychological traits that help distinguish them from the rest of society. We know empirically that such traits vary by, among other factors, level of prowess and type of sporting discipline (Piepiora & Witkowski, 2020). Looking more closely at what specifically makes athletes and their accomplishments "heroic", we ask to what extent do values like strength, bravery, public appeal and moral virtue motivate the athletic psyche? What are the implications, for that matter, of committing to such values in terms of athletes' personal well-being in a very real physical sense? These questions, and the particular value complex we seek to delimit, can be more aptly addressed, we propose, by invoking a novel conceptualisation of the popular and widely intuited cultural artifact of chivalry.

Defining Chivalry

> "*There's no shame in fear, my father told me, what matters is how we face it.*" Jon Snow, A Clash of Kings, Book 2, Chapter 23 (Martin, 1999)

Martin's work and its later TV adaptation in the form of HBO's Game of Thrones gained remarkable popularity and cultural resonance (Daffonchio, 2023; Finn, 2017). In a comprehensive analysis of the chivalrous values portrayed in the franchise, Hackney (2015) points out how the archetypal chivalrous hero Jon Snow is ultimately differentiated from his counterparts on account of his embodiment of a complete set of chivalrous values. The other knights of Westeros are, in this sense, incomplete, and miss one or more key elements from the set. Snow, as the foregoing quote suggests, is human, vulnerable, relatable, yet, in spite of any fear, shame or doubt that plagues him, he, no matter what, maintains a steely-eyed, resolute devotion to the "code". Hackney, like other scholars of chivalry, have cited a broad

panoply of candidate qualities and values that define such a code, and ensure those who faithfully enact it secure the admiration that comes with heroic status. To explore heroic chivalry and its potential effects and implications in the context of modern athletic competition, the present study adopts a novel framework for conceptualising chivalry as a particular set of values that, when adopted by individual members of a population, manifest in the form of "chivalric disposition" (CD).

A branch of research underway at our native institute has been aimed at defining CD as a psycho-social construct with three inextricably linked dimensions measuring the importance individuals place on personal qualities associated with fortitude (strength, prowess, bravery), deference (duty, obedience, self-sacrifice) and virtue (piety, subscription to higher ideals like goodness, purity or justice). Drawing on the main principles of gene-culture co-evolution theory, the values reflected within these dimensions can be treated as cultural variants amenable to the principles of Darwinian evolution in the theoretical tradition of Cavalli-Sforza and Feldman (1981), Boyd and Richerson (1985; 2011) and Laland (2017). Cultural variants in the form of particular chivalrous values are, in this sense, transmitted and reinforced in populations over time through a range of mechanisms. The variants tend to manifest in explicit yet changing forms throughout human history, as noted, for instance, in the widely recognised value codes associated with the Spartans, Romans, Medieval Christian knights (Atkins, 1996; Banner, 2015; French, 2017), Muslim holy warriors or "Mujahideen" (Hashtroodi, 2015), and Japanese Samurai (Setyanto et al., 2020). At least from the European perspective, chivalrous values are observed perhaps most explicitly in the histories of the late medieval orders of Christian knights. Such orders are considered to be the first truly disciplined fighting forces in the West since the Romans (Seward, 1995). A continuity has also been noted from their traditions and codes to those of military officers of the Renaissance (Nievergelt, 2011), and indeed well into modernity (Nye, 2007).

It is unlikely that the emergence of equivalent codes in separate cultures has been entirely coincidental, presenting what Brown (2004) in such circumstances termed as a "statistical universal". Under Tooby and Cosmides' (2015) framework, evolved psychological characteristics in humans influence behaviour in predictable and sometimes universal ways, so it is plausible that CD appeals to such characteristics in the presence of specific environmental conditions. The birth of agriculture and subsequent emergence of early human civilisations gave rise to population increase and the accumulation of surplus resources and wealth, along with the economic and legal systems required to maintain such social

institutions (Melko, 2008). The need to protect people and property engendered in early civilisation the need for policing, and with it, a sanctioned monopoly on violence (Neocleous, 2011). In a strictly Spencerian sense, it follows that societies most able to successfully codify, organise and direct such violence outwards through conquest and warfare would survive and thrive over the long-term (Turner & Abrutyn, 2017), clearly rendering chivalric codes of values culturally adaptive. Conceptualising CD in evolutionary terms ultimately portrays explicit manifestations of it merely as points on a single evolutionary timeline, forging a continuity connecting the beginnings of human civilisation to the present day. Research based on the CD framework, therefore, ultimately seeks to engage with the fundamental question, what exactly are the effects and implications of adopting chivalrous values today?

Chivalry, Combat & Sport

Dangerous combative tournaments were a key feature of early European medieval chivalry (Keen, 2005; Wetmore, 2010). Such activities can be viewed as precursory to the eventual development of modern sport as we know it today. Tournaments were opportunities to demonstrate prowess, and doubled up as effective preparation for war (McGlynn, 2016). Ranald (1998) described both knightly tournaments and modern sports simultaneously as apt "surrogates" for war. Accordingly, bravery, discipline, strategy and physical training have long been thought of as transferrable to the context of war (Cox, 2016). We observe even older, yet similar interchangeability in ancient Greece, where active citizenry, soldiering and Olympic competition were idealised and revered (Loy & Morford, 2019). Martial values have similarly been codified elsewhere in the world, in formats that also continue to survive today. Martial arts from various regions in Asia, for instance, have spread around the globe and continue to showcase physical self-defence elements with military origins (Channon & Jennings, 2014). While many martial arts disciplines also have competitive dimensions, they are not typically solely defined by tournament-style performances. Many martial arts prioritise aesthetic, philosophical and also traditional cultural components (Ciaccioni et al., 2023; Vertonghen & Theeboom, 2010). It is a matter of interest, therefore, in any study seeking to distinguish conceptually between martial arts and other combative disciplines, whether significant variations emerge empirically.

Sporting disciplines need not be based on forms of direct combat between competitors (like, say, boxing or wrestling), however, to support the development of desirable qualities transferable to war. Asadi (2023) said of the sport of powerlifting, for instance, that while lifting heavy weight does not appear to have much to do with combat, it nevertheless

promotes the development of transferable physical and psychological skills. No matter what the sport, virtue, courage, discipline and avoiding vices are values desired not only by most sports coaches (Azizi et al., 2021), but also by most military commanders. While differences might exist between practitioners of combat disciplines with or without an emphasis on cultural or aesthetic elements, researchers might also question whether direct combative elements within a sporting discipline are indeed necessary conditions for it to yield observable differences in practitioners' overarching value systems. Given the connections between the famed age of romantic chivalry and contemporary sport, the critical views of Frantzen (2004) and McCarthy (2022), meanwhile, raise a number of pressing concerns. They critically explore the dangerous tendency for chivalrous values to glorify suffering and the acceptance of bodily harm, even to the point of making the ultimate sacrifice. Chivalry, in this vein, is held responsible for some of the bloodiest episodes in 20th century European and world history. If this is so, we are entitled to ask with some urgency, what direct effects might chivalrous values be having today on the health and safety of our athletes?

Attitudes towards Injury

Physical activities like combat sports and martial arts have undeniable links to the spectre of bodily harm. Ultimately, practitioners are defined by their capacity to both inflict and endure physical harm (Channon & Jennings, 2014). Overt signs of being able to endure pain, therefore, signal prowess in this unique context. Even in high-impact sports like rugby or American football, visible scars communicate authenticity by legitimising the practitioner's identity as combat-ready. Being seen as a bona fide combatant also serves an evolutionary function in the context of intrasexual competition, particularly among males. Non-severe facial scarring, in this sense, has been associated with attractiveness in males over the short-term (Burriss et al., 2009). In other words, Burriss et al. showed that females were more attracted to partners with more masculine features as short-term mating prospects. This can render visible injuries among practitioners of combative physical activities paradoxically desirable. The evolutionary dimension helps explain, at least in part, the appeal of chivalrous values and their inherent self-sacrificial quality among males implementing intrasexual competitive strategies dependent on the expression of hyper-masculinity.

When it comes to bodily harm in the broader sporting context, not necessarily limited to combat sports, we know that some athletes are generally more averse to risk-taking behaviours under threat of injury than others (Chen et al., 2019). Non-combative athletes, for instance, vary in terms of their willingness to play through the pain, thereby risking worse

injuries over the long-term in the pursuit of short-term success. Some sports performers are more inclined to engage in such behaviours than others (Jessiman-Perreault & Godley, 2016), and while most research on sports injuries proceed on the assumption that injuries are undesirable and something to be ultimately avoided, there remains an element of romanticism invoked when injuries take on a "battle scar" aesthetic, even among non-combative athletes (Reider, 2014). Given that one might expect all athletes to possess ubiquitously negative attitudes toward injuries, it is reasonable to ask what factors might account for any deviations at all from this otherwise reasonable default. The fact that there could ever be something noble, even "holy", about visible injuries as badges of valour (Glancy, 2004), provides a clear motivation to try and understand why practitioners of certain activities might willingly and irrationally fail to mitigate risk of potentially serious harm. Given that duty and self-sacrifice feature prominently in the literature on medieval chivalry (Brewer & Windeatt, 2019), CD as a measurable construct offers some potential to explain observable variations in attitudes towards injuries among both combative and non-combative athletes. Given the proposed interplay between chivalrous values, participation in combat sports and physical activities, as well as attitudes towards injuries among practitioners of such disciplines, the present study was planned to address the following main research questions:

1) What is the relationship between chivalric disposition and attitudes towards injury?

2) What is the relationship between chivalric disposition, engagement in a variety of sporting disciplines and other measured factors?

3) What is the relationship between attitudes towards injury, engagement in a variety of sporting disciplines and other measured factors?

Method

Sampling

Ethical clearance was granted by the institutional review board at the Malta College of Arts, Science & Technology in January 2024. Malta is a small island nation that happens to be the last country on Earth to have been governed by a major order of European chivalrous knights. Malta retains a mostly European identity to this day, which can at least in part be attributed to the strong influence of the Knights Hospitaller during their reign from 1530 to 1798 (Montebello, 2009). A convenience sampling strategy was used to recruit sports students at the main national college and members of local combat sport and martial arts clubs to complete an online questionnaire, developed using the *Google Forms* platform. A total of 81

participants eventually took part, of whom 31% (n = 25) were female, and 69% (n = 56) male, enabling us to also hypothesise about gender differences. Assigning each participant the middle age from each five-year category presented in the original questionnaire with a view to also treating age as a scale variable, the mean age of the participants was approximately 26.38 (SD = 7.96). All were competitive athletes, distributed across various sporting disciplines as shown in Table 1 below. Overall, there were 37 combat athletes, 30 of whom (81%) were male, and 49 non-combat athletes, 31 of whom (63%) were male (five individuals practiced both). We also operationalised an additional variable, to distinguish those within the group of combat athletes who specifically practiced either Judo or Muay Thai. These two disciplines were differentiated due to their additional strong historical and cultural elements.

Table 1. Frequencies for participation in combat and non-combat sporting disciplines.

Sport	***Female***	***Male***	***All***
		Combat Sports	
Boxing	0	6	6
Jiu-Jitsu	1	1	2
Judo	2	3	5
Kick Boxing	0	9	9
MMA	1	5	6
Muay Thai	1	1	2
Wrestling	1	1	2
Other	1	4	5
		Non-combat Sports	
Athletics	2	0	2
Basketball	1	3	4
Football	1	11	12
Gymnastics	4	0	4
Powerlifting	1	3	4
Rugby	0	1	1
Swimming	1	2	3
Volleyball	5	1	6
Other	3	10	13

Data Collection

The remainder of the online questionnaire was dedicated to two scales, one for measuring attitudes towards injuries, and the other for measuring CD. Attitudes towards injury was measured using a bespoke scale designed for both combat and non-combat athletes. Nine items accompanied by five-point strongly disagree/strongly agree linear scales were generated by the researchers following repeated discussions to ensure face validity. The items

cumulatively demonstrated good internal reliability (*Cronbach's α* = .75), and were eventually averaged to construct a single overall *Positive Attitudes towards Injury* (*PAI*) variable. Table 2 shows the descriptive statistics for these items, including item-rest correlations. The *PAI* variable exhibited an approximately normal distribution (*Skewness* = -0.074, *SE of Skewness* = 0.267).

Table 2. Descriptive statistics for items measuring attitudes towards injury.

Item	***Mean***	***SD***	***Item-rest* r**
1. Injuries sustained during training and competition are an inevitable part of the sport I practice.	3.654	1.153	0.363
2. Overcoming injuries contributes significantly to the overall resilience and development of an athlete.	4.000	1.107	0.445
3. Regular training, body conditioning and exercises involving external impact made my body more resilient to opponents' blows/offensive physical impact.	4.148	0.923	0.455
4. I feel positive emotions about having visible injuries/bruises on my face or body after a tournament/competition.	3.136	1.563	0.403
5. There is no shame in being on the receiving end of intensive rough play.	4.025	1.172	0.396
6. Experience in rough and intense sessions made me less afraid of opponents' blows/offensive physical impact.	4.185	0.923	0.648
7. Accepting the injury is easier when caused by opponents' legal actions, rather than by other factors (eg. poor technique or equipment).	4.136	1.009	0.540
8. Competing in my sport toughens me up for everyday life.	4.395	0.890	0.294
9. Overcoming injuries and fear of impact made it easier to deal with problems outside of my sport.	4.370	0.843	0.422

Next, a 21-item scale for measuring CD (Muscat-Inglott, 2024) was used in the questionnaire. The CD scale had good internal reliability (*Cronbach's α* = .83), yielding a summative CD Index (CDI) as a composite of the three sub-dimensions of CD, namely fortitude, deference and virtue. CDI is a normalised measure taking on any value between 0 and 1, with .50 acting as a threshold for indicating the presence of CD. Basic fit and reliability statistics related to the CDI established in a prior unpublished scale-validation study based on a separate mixed-gender sample of 241 participants, are shown in Table 3. The present data showed CDI to be approximately normally distributed (*Skewness* = -0.013, *.SE of Skewness* = 0.267).

	C-Vir	***C-For***	***C-Def***	***General***
Cronbach's α	.733*	.801*	.821*	.884*
McDonald's ω	.734*	.840*	.826*	.885*
RMSEA	.049*	.070*	.059*	.088

SRMR	.041*	.048*	.032*	.080

Table 3. *Summary reliability and fit statistics for each factor and the 21 items overall (general).*
** Denotes acceptable values in terms of nominated thresholds.*

Data Analysis

The data was sorted in open-source spreadsheet software (*LibreOffice Calc v.7.3.7.2*), and imported into the open-source software application (*JASP v.0.17.2.1*) for statistical analysis. The main variables of interest were CDI, PAI, gender (F/M), dummy coded practitioner of a combat sport (CS), and dummy coded practitioner of a traditional discipline (Trd). A hypothesis-testing approach was taken, with hypotheses organised according to the three research questions posed above. The equality of variance assumption in all but the first hypothesis was tested using the Brown-Forsythe test, and duly met in every instance. The normality of distribution assumption was tested using the Shapiro-Wilk test, and was not always met, as shown in Table 4.

Table 4. Hypotheses and the inferential statistical procedures selected to test them, as well as Shapiro-Wilk test results for testing normality of distribution.

Research Hypothesis	***Normality***	***Test***	***Null***
H_1: There is an association between CD and attitudes towards injury.	$W = 0.99$, $p = .76$ *	Pearson Correlation *r*	H_0: $r = 0$
H_{2A}: CD varies between athletes who practice combat sports, and those who do not.	CB=0: $W = .98$, $p = .42$ CB=1: $W = .97$, $p = .54$	Student *t*	H_0: $\mu_{CDI\|CB=0} = \mu_{CDI\|CB=1}$
H_{2B}: CD varies between those who practice combat sports with a strong traditional component, and those who do not.	Trd=0: $W = .98$, $p = .44$ Trd=1: $W = .98$, $p = .93$	Student *t*	H_0: $\mu_{CDI\|Trd=0} = \mu_{CDI\|Trd=1}$
H_{2C}: CD varies by gender among competitive athletes.	F: $W = .97$, $p = .26$ M: $W = .95$, $p = .26$	Student *t*	H_0: $\mu_{CDI\|Male} = \mu_{CDI\|Female}$
H_{3A}: Attitudes towards injury vary between athletes who practice combat sports, and those who do not.	CB=0: $W = .98$, $p = .55$ CB=1: $W = .91$, $p < .01$	Mann-Whitney *U*	H_0: $\mu_{CDI\|CB=0} = \mu_{CDI\|CB=1}$
H_{3B}: Attitudes towards injury vary between those who practice combat sports with a strong traditional component, and those who do not.	Trd=0: $W = .97$, $p = .08$ Trd=1: $W = .75$, $p = .01$	Mann-Whitney *U*	H_0: $\mu_{CDI\|Trd=0} = \mu_{CDI\|Trd=1}$
H_{3C}: Attitudes towards injury vary by gender among competitive athletes.	F: $W = .98$, $p = .91$ M: $W = .94$, $p < .01$	Mann-Whitney *U*	H_0: $\mu_{CDI\|Male} = \mu_{CDI\|Female}$

Note. * Test of bivariate normality.

An alpha level of .05 was selected to infer statistical significance, as per social science convention. Where the Student's *t* test was used, effect sizes are reported using Cohen's *d*. In the case of the Mann-Whitney *U* test, effect sizes are presented using rank biserial correlation coefficients (r_{rb}).

Results

Table 5. Descriptive statistics for CDI and PAI.

Statistic	***CDI***	***PAI***
Mean	.650	4.005
Median	.669	3.889
Standard Deviation	0.186	0.626
95% Confidence Interval	.609, .690	3.869, 4.142
Skewness	-.049	-.074
SE of Skewness	0.267	0.267

The descriptive statistics for the two main dependent variables of interest are given in Table 5, along with 95% confidence intervals (CIs) for basic initial inferences. The CI for CDI suggests a relatively high score in the population when compared to original scale validation data (M = .558, SD = .01). Athletes in general may exhibit higher CD than non-athletes, given that the original scale validation data comprised both categories with no distinction between the two. A post-hoc Spearman test on the rank correlation between CDI and number of years of sports practice, meanwhile, provided further insight by showing small increases in CDI as individuals spend additional years practicing their sport (r_s = .23, p = .04). If more sports practice corresponds with more CDI over time, then the hypothesis that athletes exhibit higher CD than non-athletes is indirectly supported. Future research might shed further light on this relationship. With respect to the other main dependent variable of interest, PAI, no existing data exists for the purpose of comparison, since the scale used to measure attitudes towards injury was novel and bespoke. Judging solely on the basis of the original five-point Likert scales accompanying each item, where a response of five indicated strong agreement, an overall mean value of 4 implies a generally positive attitude to injuries in the sample. A lower bound confidence interval exceeding the mid-point of 3 lends further support to this assertion. To address the first research question, concerning the association between CDI and PAI, the evidence was sufficient to reject the null for H_1, suggesting a mild but statistically significant association (r = .32, p < .01), illustrated in Figure 1.

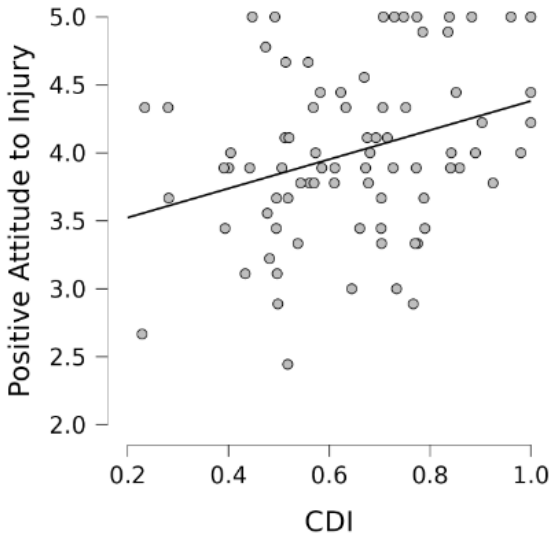

Figure 1. Scatter plot for CDI and PAI illustrating a mild, statistically significant relationship.

This result indicates that as CD increases, so does the proclivity for more positive attitudes towards injury. In other words, the more one subscribes to chivalrous values, the more likely one is to accept injuries as a normal part of their sport without fear, as well as see them as opportunities to become stronger and more resilient in the long-term, both in sport and life. From the critical perspective, given the self-sacrificial aspects of chivalry explored by Frantzen (2004) and McCarthy (2022), and theorised ties between chivalry, sport and preparation for war (Asadi, 2023; Azizi et al., 2021; Ranald, 1998), the result implicates sport in arguably more insidious implications of chivalry from a sociological perspective. From a psychological perspective rooted at the level of the individual psyche, the association between PAI and CDI can also signify increased chivalrous bravery in a positive sense. Athletes high in CD might be equipped with greater resilience than their less chivalrous counterparts, enabling them to more fully commit, as well as handle injuries more effectively if and when they occur. In terms of additional insight for understanding the developing CD framework, the association between CDI and PAI offers empirical validation for the status of CD as an affective construct with substantive influence on practical matters of interest to social scientists.

The next batch of hypotheses was designed to address the second research question, looking at variations in CDI across sporting disciplines and gender. For H_{2A}, the evidence was not sufficient to reject the null (t = 1.07, df = 79, p = .29), suggesting that athletes in non-combative sports had an average CDI (M = .67, SD = 0.19) that was not significantly different from those engaged in combat sports (M = .63, SD = 0.19). In other words, there is no reason

to believe that any difference in CD exists between athletes who engage in combat sports and those who do not. Further to the foregoing proposition that CD increases with sport participation, it would appear that the specific type of sport does not matter, rendering the hypothesised effect homogeneous across sporting disciplines. Further to Asadi (2023), the transferability of skills and traits from athletes to soldiers regardless of whether their sport is directly combative or not, is supported by the evidence. For those actively seeking to increase chivalrous tendencies, therefore, simply taking up a sport and sticking with it appears to be more important than the particular discipline is chosen. Promoting sport across the board in all its guises, therefore, would represent an apt strategic application of the present finding. A deviation from this trend did emerge, however, in the case of combat disciplines with a stronger traditional element. Although the sample size was small, the evidence was sufficient (t = -2.07, p = .04) to reject the null hypothesis that CDI did not differ across those who either do or do not partake in more traditional combat disciplines. The average CDI among athletes practicing Judo and Muay Thai specifically (M = .79, SD = 0.16) was higher than that among all remaining athletes in the sample (M = .64, SD = 0.18), regular combat athletes included, corresponding to a relatively large Cohen's effect size (d = 0.82). Figure 2 gives a visual depiction of the difference. More research is needed to substantiate this claim with greater confidence.

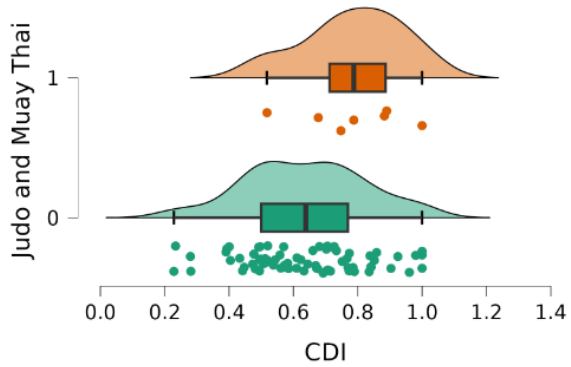

Figure 2. Raincloud plot showing distributions for CDI by those who do Judo and Muay Thai (=1), and those who do not (=0).

According to the results for H_{2C}, average CDI among females (M = .65, SD = 0.16) was not significantly different (t = 0.15, df = 79, p = .88) from that of males (M = .65, SD = 0.20). There is no reason to believe, therefore, that CD varies by gender among competitive athletes. So long as this trend extends to members of the general population not engaged in sports practice, credence is given to the argument that chivalrous behaviour is not in fact predefined by gender, and is not in fact the sole reserve of males, as suggested by much of the

contemporary literature on chivalry that assigns it a paternalistic or patriarchal nature (Hutton, 2018; Kruttschnitt & Savolainen, 2009). It is worth noting that the CD framework is based on dual-inheritance theory (Cavalli-Sforza & Feldman, 1981; Boyd & Richerson, 1985) which conceptualises attitudes, beliefs and values as heritable cultural variants. Research on CD, therefore, ultimately has, as one of its main aims, the exploration of mechanisms and factors involved in the transmission of such variants. Gender, in this sense, indeed emerges as a factor influencing the heritability of CD, albeit only when interacting with others, and not as a main effect. In other words, in the context of sport participation, possession of chivalrous values does not so far appear to be a fundamentally gendered phenomenon.

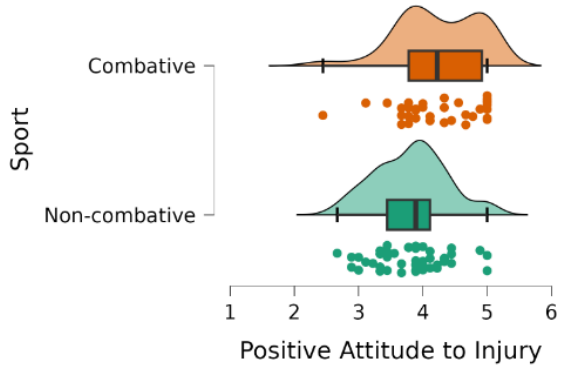

Figure 3. Raincloud plot showing distributions for PAI by those athletes who practice combat sports and those who do not.

The third batch of hypotheses was designed to ascertain variations across the same three independent variables in attitudes towards injuries. The evidence in support of H_{3A} showed PAI to be significantly ($U = 498$, $p < .01$, $r_{rb} = -.39$) higher in combat athletes ($M = 4.25$, $SD = 0.63$) than in the rest of the participants ($M = 3.81$, $SD = 0.55$), as illustrated above in Figure 3. This finding supports the "battle scar" (Reider, 2014) or "badge of valour" (Glancy, 2004) interpretation of sports injuries, and justifies the tendency to ground it specifically in the context of combat sports (Channon & Jennings, 2014). A practitioner of combat sports may view injuries more positively due to a desire to reinforce their identity as a combatant with a capacity to both endure and inflict physical harm (Burriss et al., 2009). The evidence was not sufficient ($U = 202$, $p = .34$) to reject the null hypothesis for H_{3B} that practitioners of Judo and Muay Thai had significantly different attitudes to injury ($M = 4.30$, $SD = 0.66$) than the rest of the athletes sampled ($M = 3.98$, $SD = 0.62$). A post-hoc partial Spearman correlation was performed next, to further clarify the original relationship between attitudes towards injury and CD, given the additional emerging insights. The relationship between PAI and CDI was assessed while partialing out (or "controlling for") the effects of practicing a combat sport.

The association remained virtually unchanged (r_s = .37, p < .001), strengthening the validity of CD as an independent predictor of attitudes towards injury that, despite the strong effect practicing a combat sport has on the latter. Otherwise stated, CD increases with the positivity of one's attitude to injury, regardless of whether one is in a combat sport or not.

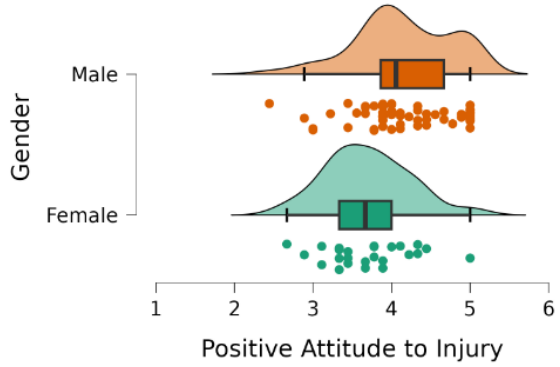

Figure 4. Raincloud plot showing distributions for PAI by gender.

Figure 4 illustrates how in terms of gender, the evidence was sufficient to reject the null hypothesis for H_{3C} (U = 389.50, p < .01). In other words, males had, on average (M = 4.15, SD = 0.62), significantly more positive attitudes towards injury than females (M = 3.69, SD = 0.53). The effect size was moderately strong (r_{rb} = .44). So while CD does not vary by gender among athletes, attitudes towards injury does. Further to enabling combat athletes to assert their combatant identity, injuries seem to have a special appeal specifically to males that is not shared by females. The intrasexual competition hypothesis (Burriss et al., 2009; Buss, 2023) offers a compelling explanation for the discrepancy. In the context of competition among males for sexual selection by females, visual injuries communicate possession of combat experience, and more to the point, display dominance to other males and attractiveness to females. We ran additional post-hoc partial Spearman correlation tests, this time mainly to test if the difference among males and females in terms of their attitude to injury was not just a result of more males in our sample being involved in combat sports, since we already know that practicing a combat sport in itself tends to increase positive injury perception. The relationship between gender and attitudes towards injury (while controlling for combat sport participation), however, remained virtually unchanged (r_s = -.31, p < .01). The relationship also remained highly significant when controlling for CDI (r_s = -.39, p < .001). Gender, therefore, appears to be the operative factor here, thereby strengthening the plausibility of the intrasexual competition hypothesis.

Conclusion

The study gives cause to suspect that CD is more prevalent in athletes than non-athletes, although further research is needed to support this claim. Nevertheless, the findings show CD to be homogeneous among athletes irrespective of their gender or the type of sport they practice. The only exception to this arose in the case of martial arts with a more traditional or cultural focus. Practitioners in these disciplines had slightly higher CD levels, however, the number of participants practicing them was small. Indeed, all claims resulting from the analysis would be stronger had a larger sample of Maltese athletes been accessible. Future studies might look to replicate our findings on larger and more diverse samples and in different locations. The conclusions we have drawn should be interpreted mainly within the context of Maltese sports, with all the political and cultural implications this entails. We nonetheless present several propositions based on our findings.

The main hypothesis of the study concerning the association between CD and attitudes towards injury was supported by the evidence with a mild, statistically significant correlation ($r = .32$, $p < .01$). This relationship did not depend on what kind of sport athletes practiced, or on whether the sport had a directly combative nature or not. This distinction matters, because combat athletes had significantly more positive attitudes to injury than non-combat athletes. This difference in combat athletes was unsurprising, given the "battle scar" or "badge of honour" culture they are sometimes suspected of subscribing to. This relationship between CD and positive injury perception can be interpreted in a number of ways. Given the main points of theoretical inquiry in the literature we propose two primary contrasting interpretations involving first, a critical sociological lens, and second, a holistic positive psychological lens. If athletes with a higher propensity to subscribe to chivalrous values are more comfortable with the prospect of incurring bodily harm, then sports promotion takes on a potentially insidious nature in the context of manipulative, propagandising mass appeals to chivalry in malleable populations overly sensitised to collective mass media messaging. Further research on chivalry from a critical Nietzschean philosophical perspective could yield fascinating insights here, on the interplay between sport, nationalism, duty and self-sacrifice. On the other hand, if athletes with a stronger commitment to chivalrous values are more accepting of the prospect of getting injured, they are less anxious and eventually able to deal with injuries as opportunities to grow in strength and resilience over the long-term. CD may thereby have a contribution to make in the study of psychological well-being at the individual level. Future studies might draw further on the CD framework to explore such possibilities not only in sports but also in other areas.

The study shows that among athletes, males and females do not differ in their propensity to subscribe to chivalrous values. When it comes to attitudes towards injury, however, they do. Furthermore, the latter relationship between gender and attitudes to injury was stable, regardless of participation in a combat sport or CD. What this suggests is that positive perception of injuries, all things being equal, is a uniquely masculine phenomenon across multiple sporting disciplines, regardless of degree of chivalrous orientation. We find the intrasexual competition hypothesis from an evolutionary psychological perspective particularly compelling in explaining this finding. Visible scars are evidence of bodily harm overcome, signaling survivability and durability. This might serve as a useful cue for deterring male competitors as well as attracting female mates, operating via evolved responses to visual scars that rouse fear among males and attraction among females. It is also interesting to note that CD and gender are independent predictors of positive injury perception, suggesting that CD operates as a cultural, transmitted value complex which, while itself fundamentally based on deep, evolved psychological traits in individuals, has a capacity for placing such individuals at heightened risk of bodily harm for the sake of the evolving culture itself. Finally, the study makes an important contribution to the developing CD framework, by correlating CDI with observable social phenomena in applied contexts, most notably courage and self-sacrifice as a function of positive injury perception. This serves to further enhance our understanding not only of the CD framework itself, but of chivalry more broadly as a well-known cultural and historical artifact.

Author Contribution

Nikola Zvicer (Conceptualisation, Theoretical Framework, Data Collection), Matthew Muscat-Inglott (Conceptualisation, Theoretical Framework, Data Analysis)

Conflict of Interest

The authors declare no conflicts of interest.

Ethical Statement

Ethical clearance was granted by the institutional review board at the Malta College of Arts, Science & Technology in January 2024.

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