



INSTITUTO
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Psychological Capital and Grit in Football and Handball Referees

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Master's in Human Resources Management & Organizational Consulting

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BUSINESS
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Department of Human Resources and Organizational Behavior

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Resumo

Objetivo: Embora haja um interesse crescente no papel vital que os árbitros desempenham no desporto, a sua faceta psicológica tem sido consideravelmente subestimada. Assim, este estudo pretende abordar esta lacuna na literatura investigando o efeito de mediação de grit na relação entre personalidade proativa e suporte social percebido para com Capital Psicológico (PsyCap) no contexto dos árbitros de futebol e andebol.

Design: Estudo transversal com uma amostra não probabilística por conveniência de 663 árbitros ativos de futebol e andebol nas categorias regional, nacional e profissional em junho de 2020.

Resultados: O PsyCap apresentou uma associação positiva com o grit, assim como o suporte social percebido para com PsyCap. A relação do suporte social percebido com o PsyCap, e a mediação desta relação por parte do Grit revelaram significância estatística. A personalidade proativa mostrou uma relação positiva com o PsyCap, assim como com o grit. A mediação desta relação pelo grit também revelou significância estatística. A moderação do desporto arbitrado não apresentou significância estatística nas trajetórias investigadas.

Conclusão: Este estudo enfatiza a importância da componente psicológica da arbitragem ao incorporar o PsyCap no contexto da arbitragem de dois desportos distintos, o futebol e o andebol. Incorpora no seu modelo a personalidade proativa, o suporte social percebido e o grit investigando os seus múltiplos relacionamentos. Argumenta-se que o PsyCap pode representar uma ferramenta adequada no contexto da arbitragem e pode ser útil para fins de recrutamento e desenvolvimento.

Palavras-chave:

Capital Psicológico; Suporte Percebido; Personalidade Proativa; Garra; Arbitragem do Futebol; Arbitragem do Andebol

JEL Classifications System:

O15 – Human Resources

L83 – Sports

Abstract

Objective: While there is an increasing interest in the vital role that referees play within sports, their psychological facet has been considerably underresearched. Thus, this study bids to address this gap in the literature by investigating the mediation effect of Grit on the relationship between proactive personality and perceived social support to Psychological Capital (PsyCap) within the context of football and handball referees.

Design: Cross-sectional study with a non-probabilistic convenience sample of 663 active football and handball referees within the regional, national, and professional categories in June of 2020.

Results: PsyCap was positively associated with grit as was perceived social support to PsyCap. The relationship of perceived social support to PsyCap and the grit mediation of this relationship revealed statistical significance. Proactive personality was positively associated with PsyCap as was with grit. Grit mediation of this relationship did also show statistical significance. Sports refereed moderation show no statistical significance in the analyzed paths.

Conclusion: This study emphasizes the psychological side of refereeing by incorporating PsyCap in the refereeing context of two distinctive sports of football and handball. It incorporates into its research model proactive personality, perceived social support and grit investigating their multiple relationships. It is argued that PsyCap may represent an adequate tool in the sports' refereeing context and may be of use for recruiting and development purposes.

Keywords:

Psychological Capital; Proactive Personality; Grit; Perceived Support; Football Refereeing; Handball Refereeing

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Contents

Acknowledgments	i
Resumo	iii
Abstract	v
Tables and Figures	ix
Abbreviations	xi
CHAPTER 1 - Introduction	1
CHAPTER 2 - Literature Review	5
2.1. Background	5
2.2. Psychological Capital (PsyCap)	5
2.3. Grit	8
2.4. Perceived Social Support	9
2.5. Proactive Personality	11
2.6. Sports context moderation: football and handball	12
CHAPTER 3 - Methodology	15
3.1. Participants	15
3.2. Procedure	15
3.3. Data Analysis	16
3.4. Measures	17
CHAPTER 4 - Results	19
4.1. Measurement model	19
4.1.1. Items' distributional properties	19
4.1.2. Dimensionality	20
4.1.3. Reliability	21
4.2. Structural model	21
4.2.1. Direct, indirect, and total effects	21
4.2.2. Sports Moderation	22
CHAPTER 5 - Discussion	25
CHAPTER 6 - Conclusion	29
6.1.1. Limitations and Future Research	30
CHAPTER 7 - References	31

Tables and Figures

Figure 2-1 - Research Model	13
Table 3-1 - Participants' sociodemographic characteristics per sport refereed	15
Table 4-1 - Items' distributional properties (N = 663)	19
Table 4-2 - Structural model paths	22
Table 4-3 - Football and handball referees' structural model	23

Abbreviations

APAF – Associação Portuguesa de Árbitros de Futebol

CFA – Confirmatory Factor Analysis

CFI – Comparative Fit Index

FPF – Federação Portuguesa de Futebol

FPA – Federação Portuguesa de Andebol

FGCS – First-Generation College Students

NFI – Normed Fit Index

CPC-12 – Compound Psychological Capital

PPS – Proactive Personality Scale

PsyCap – Psychological Capital

RMSEA – Root Mean Square Error of Approximation

SEM – Structural Equation Modelling

SRMR – Standardized Root Mean Square Residual

TLI – Tucker Lewis Index

CHAPTER 1 - Introduction

Sports' impact on society is undeniable as they reiterate various ideas and beliefs while integrated into significant spheres of social life and economic sectors (Coakley, 2017). Though players and technical staff get much of the attention, referees are also an integral part of sports. Referees are entrusted with enforcing sets of rules and guidelines, ensuring that competitions are conducted safely while promoting fair competitiveness and directly influencing the quality of the sporting experience for both participants and spectators (Cuskelly & Hoye, 2013; Warner et al., 2013). In essence, whether there is one leading referee as in football or two with similar responsibilities as in handball, without a referee, there would be no enforcement of rules and both in a philosophical and literal sense, no game. Nevertheless, referees' scrutiny has significantly increased since the late twentieth century, matching sports' further embracement of professionalism and enhanced commercial orientations, resulting in referees' decisions progressively inheriting significant economic and social implications (Webb, 2018). Moreover, with the advent of technology into sports, referees' increased exposure to criticism is evident as it created a two-edged situation, both helping referees to better their decisions while simultaneously promoting the over analysis of every possible infraction further increasing the pressure over each ruling. For instance, in football (or soccer or association football), while the addition of Video Assistant Referees (VAR) has significantly raised referees' decisions accuracy (Spitz et al., 2020), it has predominantly prompted negative sentiments in spectators who end up directing their discontent to referees who have the entire burden for the merit of the protocols and technology trusted upon their shoulders (Kolbinger & Knopp, 2020).

Given sports referees' standing and unavoidable influence on sports' outcomes, literature on the role has considerably grown in the past couple decades. Regarding football referees' performance, Aragão e Pina (2018) showed in an integrative review that almost all articles concerning the topic (95.88%) were published after 2001 with the emergence in the last decade of previously less researched themes such as developmental models and psychology. More recently, other topics have been studied such as the introduction of VAR into the sport (Carlos et al., 2019; Samuel et al., 2020; Spitz et al., 2020), mental models (Aragão e Pina et al., 2021; Sinval et al., 2020), individual characteristics for excellency (Aragão e Pina et al., 2019; Schnyder & Hossner, 2016) and the impact of the Covid-19 pandemic in sports (Webb, 2021). Inversely, despite its popularity, though mainly in Europe, there is limited literature concerning handball in general (Saavedra et al., 2018) and even less regarding handball referees in particular. Nevertheless, the sport has been investigated more frequently from 2010 onwards

(Prieto et al., 2015). Specific topics covered concerning handball referees include, for example, sources of stress (Tsorbatzoudis et al., 2005), specific psychological features (Valdevit et al., 2011), self-efficacy (Diotaiuti et al., 2017), decision making (Morillo et al., 2017) and mental models (Kiss et al., 2020).

The broad literature recognizes that referees require specific psychological skills and characteristics to allow them to learn and develop their potential to perform successfully in their endeavors, both on and off the field of play (Aragão e Pina et al., 2019; Cuskelly & Hoye, 2013; Guillén & Feltz, 2011; MacMahon et al., 2015; Webb, 2020a). Indeed, psychological preparation has been considered to have identical performance implications as physical preparation (Blumenstein & Orbach, 2014). However, while increasingly studied, referees' psychological dimension still does not have the same emphasis as other themes (Aragão e Pina et al., 2018). Moreover, as refereeing attrition is increasingly acknowledged as a global, and substantial sport management problem, more the need to find possible avenues of intervention and to identify the factors that contribute to the persistence and thriving of some and cessation of others (Cuskelly & Hoye, 2013; Livingston et al., 2017; Ridinger, Kim, et al., 2017). From this perspective, the inclusion of reasoned, and established constructs from other contexts into sports referees' research may prove beneficial in satisfying these needs, and hopefully even beyond. Psychological Capital (or PsyCap, in short) may be one of those constructs; there is no record of its use in any study concerning specifically sports referees; however, it is researched in a wide variety of settings such as academic (K. W. Luthans et al., 2019; Martínez et al., 2019), organizational (Bogler & Somech, 2019; Madrid et al., 2018), and sports organizations (Kim et al., 2017, 2019; Morgan, 2018). Thus, the broad literature is used as groundwork to consider PsyCap in the sports refereeing context in general, and particularly in football and handball referees.

PsyCap defined as “an individual’s positive psychological state of development” (F. Luthans, Youssef, et al., 2007) concerns individuals’ strengths rather than weaknesses, changing the focus from what is wrong and dysfunctional to what is right and good about them, and how they can thrive by capitalizing on the positive aspects of their environment (F. Luthans et al., 2004). Thus, PsyCap is inherently a positive construct (Seligman & Csikszentmihalyi, 2000) and a possible answer to the call for a shift in the pessimistic research approach through which the experiences of sports officials are regularly viewed and studied (Kellest & Shilbury, 2007; Titlebaum et al., 2009). Additionally, PsyCap is a higher-order core construct that encompasses the constructs of hope, efficacy, resiliency, and optimism (i.e., “HERO”), not only additively but also synergistically (F. Luthans, Youssef, et al., 2007). Interestingly, some of

these constructs have been individually acknowledged in sports referees' literature. For instance, Guillén and Feltz (2011) model of "refficacy" established faster, and more accurate decisions among other improvements in referees with higher levels of self-efficacy. Moreover, Aragão e Pina et al. (2019) study on excellency in football referees deemed resilience as a transversal and essential trait in-game management. These individual relationships between constructs and desirable characteristics for optimum refereeing provide good expectations regarding PsyCap applicability in sports' refereeing context, and the consequent drawing of practical conclusions.

Referees are susceptible to incessant pressures, and unsportsmanlike behaviors that often promote a state of amotivation, leading to their discontinuation (Livingston & Forbes, 2016; Titlebaum et al., 2009). Indeed, referees encounter cognitive, emotional, and physical demands, resulting in numerous outcomes such as increased anxiety, and stress levels corroborated across various sports officiating contexts (Guillén & Feltz, 2011). Considering that one of the main reasons referees mentioned for initiating and persisting in refereeing is an "intrinsic love for the game" (Livingston & Forbes, 2016, p. 348), having grit — defined as "perseverance and passion for long-term goals" (Duckworth et al., 2007) — may be an indispensable trait for referees. In fact, such as a gritty individual, a referee is expected to work towards and surpass numerous challenges while maintaining a constant effort and interest over an extended period despite failure, adversity, and hardship that may be encountered. As such, the consideration of grit is an original and pertinent contribution to the football and handball refereeing literature.

The study further contemplates upon referees' perceived social support, the cognitive appraisal of being reliably connected to others as defined by Barrera (1986). According to the literature, refereeing stress negatively influences sports referees' mental health, performance, job satisfaction, and retention (Cuskelly & Hoye, 2013; Taylor et al., 1990; Voight, 2009). Alternatively, social interactions between referees are considered a positive element of refereeing, with referees themselves stating that support by their peers assisted them in enhancing self-esteem, performance, and retention (Kellett & Shilbury, 2007). Moreover, Phillips and Fairley (2014) conducted interviews with Australian rules football referees who revealed the social facet of refereeing; the camaraderie between referees was stated to reinforce and validate their identity as referees, with those becoming a vital part of their social network and further being recognized as an essential part to produce well-refereed games.

Additionally, football and handball referees must expect the unexpected, meaning they must be preventive of illegitimate or unsportsmanlike behaviors, and proactive in their game approach. Indeed, proactivity is considered a vital game management skill to prevent matches

from escalating, possibly resulting in hostile episodes between players, and consequently, disciplinary actions or loss of match control (Aragão e Pina et al., 2019; Schnyder & Hossner, 2016). As such, proactive personality, defined as a disposition toward taking action to influence one's environment (Bateman & Crant, 1993), is also considered in this study.

Consequently, drawn from the broader PsyCap literature, both proactive personality, and perceived social support are introduced as factors to achieve a more detailed understanding of the antecedents that form grit, and PsyCap on sports referees. Additionally, it is explored how grit mediates the relationship between proactive personality and PsyCap and the relationship between perceived social support and PsyCap. It is also investigated the refereed sport moderator effect, this is, whether the tested model paths' are similar in the case of football, and handball referees. Towards providing more robust results, and relevant findings, this study incorporates differentiated and unique referee samples from two distinctive invasion sports, football, and handball, with both integrating a substantial number of individuals both in absolute and relative values as the former features over five hundred individuals and the latter represents nearly the entire population of actively enrolled referees in Portugal. In fine, the study aims to determine the suitability of the PsyCap construct in the sports' refereeing context and the validation of the proposed relationships.

CHAPTER 2 - Literature Review

2.1. Background

Referees make use of specific psychological skills to maximize their performance and attain the high standards demanded of them at all times (Samuel, 2015), however, the topic remains undervalued in the refereeing context (Aragão e Pina et al., 2018). Researchers have dwelled on referees' human capital (Dohmen & Sauermann, 2016; Weston, 2015) and social capital (Kellett & Warner, 2011), yet research on psychological capital — which surpasses both social and human capital — regarding referees still has not been explored.

The literature on PsyCap has primarily focused its attention on the relationship between PsyCap and several outcomes such as employee performance and desirable employee attitudes as organizational commitment, empowerment, and job satisfaction (Newman et al., 2014). Progressively more research has been directed at its antecedents and factors that lead to or inhibit PsyCap formation as this knowledge can assist organizations in implementing individual development PsyCap initiatives. For instance, Avey (2014) concluded that individual differences were the strongest predictor of PsyCap. Thus, we answer the call for increased research into PsyCap antecedents and outline in this study three constructs as such — perceived social support, grit, and proactive personality — which we consider to be relevant for every referee in their practice while also considering the possibility perceived social support, and proactive personality may be predictors of grit as well.

2.2. Psychological Capital (PsyCap)

From the traditional economic capital (tangible assets) to human capital (experience, skills, and knowledge) and social capital (relationships, and network of contacts), Fred Luthans et al. (F. Luthans & Youssef, 2004) established positive Psychological Capital (PsyCap) as the next logical step in capital expansion for competitive advantage. While human capital focuses on “what you know” and social capital in “whom you know”, PsyCap goes a step further, converging on “who you are” and the development of the actual self into the possible self and thus, transcends other organizational assets (e.g., human and social capital) in the developmental sense (F. Luthans et al., 2015).

Hence, PsyCap is defined for being “an individual's positive psychological state of development characterized by (1) having confidence (*self-efficacy*) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (*optimism*) about succeeding now and in the future; (3) persevering toward goals, and when necessary,

redirecting paths to goals (*hope*) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (*resilience*) to attain success” (F. Luthans et al., 2015, p. 2). The interaction between psychological skills is suggested to have a larger impact on performance and attitudinal outcomes than the individual positive psychological skills by themselves hence the whole (PsyCap) may be greater than the sum of its parts (self-efficacy, optimism, hope, and resiliency) (F. Luthans, Youssef, et al., 2007). A meta-analysis conducted by Avey (2011) supports PsyCap as a predictor of performance, job attitudes and behaviors. Additional research has also suggested that developing employee PsyCap can lead to positive individual and organization outcomes (F. Luthans et al., 2010).

Additionally, PsyCap has been empirically demonstrated to have more stability over time when compared to personality traits although still being open to change and development and considered as more “state-like” — malleable and open to development — than “trait-like” — relatively more stable and less inclined to change (F. Luthans, Avolio, et al., 2007). Most recently, PsyCap has moved from just a focus on work PsyCap to also include relationship PsyCap, health PsyCap, and overall well-being PsyCap (F. Luthans et al., 2013). Moreover, previous studies have demonstrated encouraging results regarding psychological intervention programs in the refereeing context (Lupşa et al., 2020; Mathers & Brodie, 2011; Samuel, 2015).

PsyCap is empirically demonstrated to be a higher-order core construct that comprises the constructs of hope, self-efficacy, resiliency, and optimism (i.e., “HERO”) not only additively but also synergistically (F. Luthans, Youssef, et al., 2007). Within the positive psychology approach, *hope* is neither simply wishful thinking nor just striving for the best, rather hope is “a positive motivational state that is based on an interactively derived sense of successful (1) agency (goal-directed energy) and (2) pathways (planning to meet goals)” (Snyder et al., 1991, p. 287). An individual who possesses hope sets realistic, simultaneously challenging goals and expectations and then works towards those objectives through determination, energy, and perception of internalized control (F. Luthans, Youssef, et al., 2007). The pathways component of hope refers to the capability of generating alternative paths to desired destinations should the original ones become blocked (Snyder et al., 2002). In the sports context, few researchers have probed into hope and those who have perceived it mostly concerning athletic achievement (Curry et al., 1997; Gould et al., 2002). While not explicitly studied on referees, the psychological resource of hope is relatable to referees as they too establish goals and expectations regarding their progression in competition levels, for instance (Aragão e Pina et al., 2019). Hence, a hopeful referee is one who carefully plans pathways to maximize his or her success and exhibits both the willpower and way power to accomplish the established goals.

Self-efficacy, another PsyCap dimension, is defined in the organizational context as the belief an individual has in being able to execute a specific task to achieve a particular outcome (Bandura, 1997). Efficacious employees are comfortable with challenges and difficult tasks as they trust their abilities much as an efficacious referee trusts their skills to achieve good performance. Moreover, self-efficacy is understood to be essential in mitigating anxiety (Bandura, 1997). Particularly in the refereeing context, Guillén and Feltz (Guillén & Feltz, 2011) model of “refficacy” showed faster and more accurate decisions, lower stress levels, and greater commitment as some of the self-efficacy outcomes. Subsequent publications have found evidence of a positive relationship between self-efficacy and performance in multi-sports contexts such as football, handball, and basketball (Diotaiuti et al., 2017; Karaçam & Adiguzel, 2019; Karaçam & Pular, 2017; Myers et al., 2012). Furthermore, Aragão e Pina et al. (2021) found a positive relationship between self-efficacy beliefs and team adaptation perceptions.

Additionally, *resilience* is “the positive psychological capacity to rebound, to “bounce back” from adversity, uncertainty, conflict, failure or even positive change, progress and increased responsibility” (F. Luthans, 2002a). PsyCap resilience is seen as more reactive than proactive, with the ability to not only recover from setbacks but to have the will and fortitude to overcome challenges (Youssef & Luthans, 2007). In the sports context in general, resilience has been explored and deemed vital at both individual - how athletes overcome poor results and improve performance (Fletcher & Sarkar, 2012; Sarkar & Fletcher, 2014) — and organizational level — how sports clubs recover from adverse conditions and significant change (Fasey et al., 2021; Wicker et al., 2013). Particularly on referees, MacMahon, Mascarenhas, and Plessner (MacMahon et al., 2014), when analyzing interviews with referee development managers in Australia, exposed resilience was one of the positive traits mentioned as necessary for a good referee. Moreover, resilience is linked with persistence in the role of refereeing (Livingston & Forbes, 2016), in addition to being a relevant factor in-game management and suggested to be underestimated in the refereeing context and thus in need of further research (Aragão e Pina et al., 2019).

Lastly, according to Seligman (1998), *optimism* is an attributional style that explains positive events in terms of personal, permanent, and pervasive causes, and negative events as external, temporary, and situation-specific. In the psychological capital setting, optimism is associated with a positive outcome outlook, and it is perceived as more practical and realistic (F. Luthans, 2002b). Thus, realistic optimism includes an assessment of what one can and cannot accomplish in a particular situation and hence adds to one’s efficacy and hope (F. Luthans, Avolio, et al., 2007). Conveying this perspective into the refereeing context, an

optimistic referee is expected to be more easily motivated, have high morale, high levels of aspiration and goals, and perceive setbacks (e.g., poor performances) as temporary, not as personal inadequacies, and view them as one-time unique circumstances. Indeed, higher levels of optimism in basketball referees were found to yield reduced perceived stress intensity (Kaissidis-rodafinos & Anshel, 2000).

As far as we know, there is no record of PsyCap in any study targeted specifically on sports referees, notwithstanding the construct has been lengthily researched in organizational contexts (Avey et al., 2011; Newman et al., 2014), which can be used as a foundation to consider PsyCap in the sports refereeing context. Indeed, previous studies in organizational contexts have incorporated PsyCap mediated relationships into their framework. For instance, Luthans, Norman, and Avolio (2008) observed and found full support for PsyCap mediation of the relationship between supportive climate and employee performance. In a sports organizations context. Kim et al. (2019) introduced a framework with multiple PsyCap mediated relationships, including meaningful work, job satisfaction, and supportive organizational climate uncovering partial and full mediation results.

2.3. Grit

Grit has been defined as a psychological construct established through an individual's passion and perseverance for long-term goals with a strong desire to attain a single objective; a gritty individual is one who approaches achievement as a marathon with stamina as his or her advantage (Duckworth et al., 2007). It entails working towards and surpassing challenges while maintaining a constant effort and interest over a wide period, despite failure, adversity and hardship encountered. Duckworth, Peterson, and Matthews (Duckworth et al., 2007) further establish that to achieve success, grit is a necessary quality in any field, and ability alone is not enough for success.

The grit construct is commonly operationalized as a higher-order construct with two first-order dimensions termed *consistency of interest*, regarding the tendency to not repeatedly change goals and interest, and *perseverance of effort*, concerning the tendency to work hard even with setbacks and hardships. However, Credé, Tynan, and Harms (2017) argue that their findings do not support the claim that grit is a higher-order construct. The authors contend the combination of both sub-scales result in a significant loss in the ability to predict performance further adding that perseverance is a much better predictor of performance than either consistency or overall grit. Nevertheless, the retention prediction capability is recognized particularly in settings where retention is problematic (e.g., sports referees) as it may allow

researchers to identify individuals who might benefit the most from interventions that target grit. Indeed, grit has been shown to predict retention in the military, workplace sales, high school, and marriage (Eskreis-Winkler et al., 2014), the outperformance of novice teachers compared to their colleagues (Robertson-Kraft & Duckworth, 2014), and the innovativeness of Austrian entrepreneurs (Mooradian et al., 2016). In the sports context, Larkin et al. (2016) observed grit influence in sport engagement and perceptual-cognitive expertise regarding elite youth football players and revealed that grittier players participated more in sport-specific activities and performed better on assessments of decision making and situational probability.

Diving into the previously observed PsyCap constructs of hope, self-efficacy, resilience, and optimism, one may find similarities with grit's definition of perseverance and continued interest; Luthans et al. (2007) characterization of PsyCap mentions putting in the necessary effort to succeed at challenging tasks (hope), persevering toward goals (optimism) and bouncing back (resilience). However, one clear distinction is that grit has been identified as being more trait-like (Duckworth et al., 2007) rather than state-like as PsyCap (F. Luthans, Avolio, et al., 2007). Moreover, Kyle Luthans et al. (2019) explored the mediational role that academic PsyCap played in the relationship between grit and student academic performance, uncovering a clear indirect influence of academic PsyCap in the relationship between grit and academic performance. The authors acknowledged that grit and resilience are relatable, although clearly distinguishable as grit also incorporates conscientiousness (the extent to which a person is dependable and responsible) and self-control (the extent to which an individual can control impulses and regulate emotions). Credé, Tynan, and Harms (2017) challenge this distinctiveness however, Duckworth and Seligman (2017) countered that self-control constructs such as grit could reliably predict important outcomes worthy of further study.

Hence, while no articles were found that considered grit explicitly on sports' referees, from the observed literature we posit:

Hypothesis 1. *Grit is positively related to PsyCap*

2.4. Perceived Social Support

Social support may be broadly referred to as any process through which social relationships might promote health and well-being (Cohen & Gordon, 2000). Social support has been described as a meta-construct comprising three sub-constructs: social embeddedness, perceived social support, and enacted/received social support (Barrera, 1986); the focus of this research will be on perceived social support. Perceived social support has been defined as the cognitive

appraisal of being reliably connected to others (Barrera, 1986) and is measured by assessing recipients' perceptions concerning the general availability of support and/or overall satisfaction with support provided (Sarason, Pierce, et al., 1990). It differs from enacted/received social support - actions performed when assistance is rendered to an individual (Barrera, 1986) - measured by assessing what an individual specifically does when providing support.

Perceived social support has been regularly linked to health outcomes as people who are more socially integrated tend to be healthier, both physically and mentally, than those who are more socially isolated (House et al., 1988; Lin et al., 1979; I. G. Sarason et al., 1994). The cognitive and stress-buffering theory accounts for this relationship, arguing that those with social ties are protected from the potential pathogenic effects of stressful events (Cohen & Gordon, 2000). The stress-buffering hypothesis considers social support's main role as the conveying of information that others care about and value the individual. Hence, the support stems from the way it is perceived by the recipient and its effect on the relationship and not so much on the support action *per se*. This view is further reinforced by Cassel's (1976) argument that the conveying of caring and positive notions to the recipient may be more accountable for positive outcomes than any specific behavior.

In the sports refereeing context, referees are found to be susceptible to increased levels of anxiety and stress across various sports, negatively influencing their mental health, performance, job satisfaction, and retention (Cuskelly & Hoye, 2013; Rainey & Hardy, 1999; Taylor et al., 1990). In the opposite direction, social interaction has been found to be a positive element of officiating, with referees stating that those interactions assisted them in enhancing self-esteem, performance, and retention (Kellett & Shilbury, 2007). Indeed, referee's social experience is directly correlated to the referee's involvement and developing of a sense of community, two aspects considered essential to overcome stress inherent to the refereeing task (Warner et al., 2013).

People rely on their social relationships to help them cope with many stressors over the course of their lives. As previously stated, it is believed those with social ties are better protected from potential negative influences of stressful events (Cohen & Gordon, 2000). In fact, Slack (2013) interviewed fifteen elite premier league referees and from those, thirteen highlighted access to social support with some considering the support received from their peers invaluable and crucial for their refereeing. Moreover, from the multidimensional characterization of excellency in refereeing, Aragão e Pina et al. (2019) results showed considerable relevance of the sociable variable regarding referees' *Individual Preparation* dimension. Thus, it is argued that increased perceived social support might play a critical role in the development of personal

psychological resources (Newman et al., 2018). For example, emotional support from close friends is likely to make a referee feel more confident in his ability to deal with challenges (optimism), put setbacks behind (resilience), and develop different pathways to achieve his goals (hope). Additionally, an individual who perceives greater support from his peers might maintain (or even increase) his interest in the tasks on hand and persevere on his objectives' pursuit, eventually becoming a grittier individual. Further research has dabbled on perceived support and academic achievement and has demonstrated a correlation between perceived social support and PsyCap of postgraduate students at university (Nielsen et al., 2017) and how perceived social support and/or grit may aid students to reach their objectives (Almeida et al., 2021; Clark et al., 2020; Eskreis-Winkler et al., 2014). Hence, we posit:

Hypothesis 2. *Perceived Social Support is positively related to PsyCap*

Hypothesis 3. *Perceived Social Support is positively related to Grit*

Hypothesis 4. *Grit mediates Perceived Social Support relationship on PsyCap*

2.5. Proactive Personality

Proactive personality is defined as a disposition toward taking action to influence one's environment, with the prototypic proactive personality branded as one who is relatively unconstrained by situational forces and who affects environmental change (Bateman & Crant, 1993). The topic of interactionism holds the proactive personality construct background, which argues that situations are as much a function of the person as the person's behavior is a function of the situation (Bowers, 1973) thus, individual, environment and behavior continuously influence another (Bandura, 1986). Moreover, proactive individuals are characterized by seeking out new experiences and activities, showing initiative, being goal-oriented, and persevering to bring about meaningful change by the opposition, individuals who are not proactive fail to seize and thrive on opportunities or even to identify them; they show little initiative while relying on others who become forces for change thus ending up to passively adapt to the circumstances (Bateman & Crant, 1993).

Research has associated a proactive personality with outcomes such as career success (Seibert et al., 2001), job performance (Thompson, 2005), and charismatic leadership (Crant & Bateman, 2000). As expected, proactive personality is also linked to several proactive behaviors including career initiative and innovation (Seibert et al., 1999, 2001), social network building (Thompson, 2005) and learning and development behavior (Major et al., 2006). Parker and colleagues (2006) conceptualized proactive behavior by combination of proactive personality

and personal initiative concepts. Through that conceptualization, Grant and Ashford (2008) defined proactive behavior in a workplace context as anticipatory action that employees take to impact themselves and/or their environments. The mentioned definition suggests that proactivity is not a unique set of behaviors, but rather a process involving planning, anticipating, and striving to have an impact.

In the sports refereeing context in general, but in football and handball particularly, referees must indeed have planning and anticipation skills for optimal performance (Aragão e Pina et al., 2019; Schnyder & Hossner, 2016). They must *expect the unexpected* in the sense they must be preventive of illegitimate or unsportsmanlike behaviors and proactive in their game approach to readily enforce rules and regulations. Acting proactively may be the difference between loss of match control or having decisions generally respected. Indeed, while anticipating actions in refereeing has received little academic consideration, its importance for game management is recognized and further research is suggested (Aragão e Pina et al., 2018, 2019; Guillén & Feltz, 2011).

This action-oriented behavior and goal-driven process (Parker et al., 2010) that characterizes individuals with a proactive personality can be related to the gritty individual and its perseverance for long-term goals (Houston et al., 2020). Like gritty people, proactive individuals formulate goals, work through problems, and persevere to achieve desired outcomes. However, a distinctive characteristic of proactive individuals may be their focus on goals relating to constructive change in their environment rather than simply the pursuit of personal goals and individual success.

Avey (2014) includes trait-like individual differences as one of the four clusters considered to be PsyCap antecedents, with the said cluster being the strongest predictor of PsyCap. In the same study, proactive personality (alongside self-esteem) was found to explain unique variance regarding PsyCap with its reasoning grounding itself on the strong correlation between PsyCap and cognitive dispositions (Avey, 2014).

Hypothesis 5. *Proactive Personality is positively related to PsyCap*

Hypothesis 6. *Proactive Personality is positively related to Grit*

Hypothesis 7. *Grit mediates Proactive Personality relationship on PsyCap*

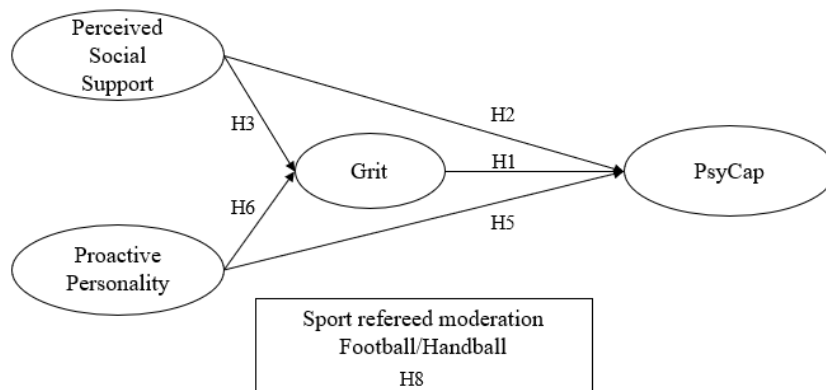
2.6. Sports context moderation: football and handball

While football and handball are both invasion and team sports, they are altogether different sport; from the football grass fields to the hard floors of handball to the evident different way

of play with the feet and hands, respectively, refereeing each sport is also a divergent experience. Particularly in football, a match “is controlled by a referee who has full authority to enforce the Laws of the Game in connection with the match” (IFAB, 2021, p. 65), while in a handball match, “two referees with equal authority shall be in charge of each game” (IHF, 2016). Furthermore, different sports have different velocities of play and technicalities requiring diverse skills that impact a referee’s performance (Pizzera & Raab, 2012). Following the call that referees’ roles should be studied separately (Aragão e Pina et al., 2018), it is suggested to investigate if the differing contexts included in the study (i.e., football and handball) may shape divergent conclusions in the proposed model. As such, this study contends:

Hypothesis 8. *Investigate whether there is a moderation effect of the sport refereed in the proposed model (sport refereed moderation).*

Figure 2-1 - Research Model



- H1:** Grit is positively related to PsyCap
- H2:** Perceived Social Support is positively related to PsyCap
- H3:** Perceived Social Support is positively related to Grit
- H4:** Grit mediates Perceived Social Support relationship on PsyCap
- H5:** Proactive Personality is positively related to PsyCap
- H6:** Proactive Personality is positively related to Grit
- H7:** Grit mediates Proactive Personality relationship on PsyCap
- H8:** Investigate whether there is a moderation effect of the sport refereed in the proposed model (sport refereed moderation).

CHAPTER 3 - Methodology

3.1. Participants

A sample of 663 football referees and handball referees completed the survey. The study participants' sociodemographic characteristics per sport refereed may be found in Table 3-1. Interestingly, very similar mean ages were encountered between sports, with football referees presenting a slightly higher mean age ($M = 28.51$; $SD = 8.84$) when compared to those refereeing handball ($M = 28.34$; $SD = 7.71$). Out of the 549 football referees, three referees did not disclose their primary role however, of those that did, the sample revealed 60.44% ($n = 330$) referees and 39.56% ($n = 216$) assistant referees; there is no role differentiation in handball as both referees have identical responsibilities.

Table 3-1 - Participants' sociodemographic characteristics per sport refereed

	Sports	
	Football ($n = 549$)	Handball ($n = 114$)
Sex (male) %	88.72	87.39
Number of children %	None	70.13
	One	16.21
	Two or more	13.66
Working years as referee $M (SD)$	9.86 (8.99)	9.72 (6.41)
Level (national) %	18.94	71.93
Academic Level		
12th grade or lower %	47.49	40.53
Graduation %	39.56	42.35
Post-graduation %	12.94	17.12
Biometrics		
Height $M (SD)$	175.38 (8.7)	177 (7.2)
Weight $M (SD)$	71.83 (10.81)	79.27 (12.74)

Note. Some referees ($n = 11$) did not indicate their sex

3.2. Procedure

Participants were approached through an e-mail invitation containing a survey link and related instructions for completion. Concerning football referees, the e-mail was sent through official representatives from the 22 regional associations, the referees' union body (APAF), and the Portuguese Football Federation (Federação Portuguesa de Futebol – FPF). Regarding handball referees, only national ranked referees were targeted. As such, the e-mail was sent through the Portuguese Handball Federation (Federação Portuguesa de Andebol – FPA).

The adapted instruments followed the *International Test Commission guidelines for translating and adapting tests* (International Test Commission, 2017) when altering the items

to the Portuguese language. Moreover, a pilot study was conducted to ascertain the understandability and correct functioning of the resulting instrument.

This approach granted a higher assurance of reaching the desired sample as only officially enrolled referees in the respective sports authorities received the invitation to participate in this research. Responses were collected via the web based LimeSurvey system (LimeSurvey GmbH, 2021). The participants were approached at the end of the 2019/2020 sports season through an e-mail invitation containing a survey link and related instructions for participating in the study.

3.3. Data Analysis

All the analyses were performed within *R* (R Core Team, 2019) using the integrated development environment, *RStudio* (RStudio Team, 2019) considering an $\alpha = .05$.

The descriptive statistics were estimated using the *skimr* package (McNamara et al., 2021). The dimensionality of the psychometric instruments was assessed using confirmatory factor analysis (CFA), while the structural model was tested using full SEM (structural equation modelling). Both through the *lavaan* package (Rosseel, 2012) using the Weighted Least Squares Means and Variances (WLSMV) estimator or the maximum likelihood estimation with robust (Huber–White) standard errors (MLR) depending on the sample size.

The goodness-of-fit indices used were the TLI (Tucker Lewis Index), NFI (Normed Fit Index), χ^2/df (ratio chi-square and degrees of freedom), CFI (Comparative Fit Index), the RMSEA (root mean square error of approximation), and the SRMR (Standardized Root Mean Square Residual). For values of $\chi^2/df < 5$, values of *CFI*, *NFI* and *TLI* $> .95$, values of *SRMR* $< .08$, and *RMSEA* $< .08$ the fit of the model was considered good (Marôco, 2021). All paths (total, direct and indirect effects) had their effects reported with 95% confidence interval.

The Cronbach's α , and the McDonald's ω were used as reliability estimates of internal consistency for first-order constructs. While the $\omega_{\text{partial } L1}$ (the proportion of variance explained by second-order factor after partialing the uniqueness of the first-order factor), ω_{L2} (the variance of the first-order factors explained by the second-order factor), and ω_{L1} (the proportion of the second-order factor explaining the total score) were used as second-order internal consistency estimates. As the internal consistency estimates were calculated via the *semTools* package (Jorgensen et al., 2021).

3.4. Measures

Psychological Capital was measured using the Compound PsyCap Scale or CPC-12 (Lorenz et al., 2016) is composed of 12 items (e.g., “I am confident that I could deal efficiently with unexpected events”) answered on a six-point ordinal scale ranging from 1 (“Strongly disagree”) to 6 (“Strongly agree”). The structure of the scale is comprised of four factors: hope (three items), self-efficacy (three items), resilience (three items), and optimism (three items).

Grit was measured using the Grit Scale short version (Duckworth et al., 2007; Duckworth & Quinn, 2009). The instrument originally composed of 12 items is reduced to 8 items in the short version (e.g., “I have overcome setbacks to conquer an important challenge”), and it is answered in a five-point ordinal scale ranging from 1 (“Not like me at all”) to 5 (“Very much like me”), integrating two dimensions: consistency of interest and perseverance of effort.

Perceived Social Support was measured using the F-SozU K-6 (Kliem et al., 2015). The instrument is a 6-item (e.g., “If I’m very depressed, I know who I can turn to”) shortened version of a well-established German psychometric instrument (F-SozU K-14) and of comparable reliability to both similar instruments with 14 and 22 items. It assesses social support in the natural environment (general social support) and it is answered in a five-point Likert-scale ranging from 1 (“Does not apply”) to 5 (“Exactly applicable”).

Proactive Personality was measured using the Proactive Personality Scale (Bateman & Crant, 1993). The instrument is composed of 17 items (e.g., “Nothing is more exciting than seeing my ideas turn into reality”) and is answered through a seven-point Likert-scale ranging from 1 (“Strongly disagree”) to 7 (“Strongly agree”).

Type of sport. This research also seeks to determine the impact of the type of sport refereed (i.e., football vs. handball) has on the relationships examined here, thus it was coded the type of sport that each referee was engaged with.

CHAPTER 4 - Results

4.1. Measurement model



























4.1.1. Items' distributional properties

The items of the PPS revealed acceptable distributional properties and received the full range of possible answers (i.e., 1 to 7). The CPC-12 items had acceptable distributional properties, with only item 3 and item 8 exhibiting slightly higher absolute values of ku ($ku_{item\ 3} = 4.11$; $ku_{item\ 8} = 3.43$). Additionally, all items, except item 3 ($min = 2$), presented the full range of possible answers (i.e., 1 to 6). It is important to note that item 3 is a reversed item resulting in inevitable trade-offs that should be highlighted and could partially explain results (Suárez-Alvarez et al., 2018). The Grit-S items revealed adequate psychometric sensitivity while obtaining the full range of possible answers (i.e., 1 to 5). The F-SozU K-6 items presented acceptable evidence in terms of psychometric sensitivity without severe univariate normality violations. All items obtained the full range of possible answers (i.e., 1 to 5). The items' descriptive statistics are presented in Table 4-1.

Table 4-1 - Items' distributional properties (N = 663)

Item	$N_{missing}$	M	SD	Min	P_{25}	Mdn	P_{75}	Max	Histogram	SEM	CV	$Mode$	sk	ku
<i>PPS</i>														
Item 1	69	5.85	1.17	1	5	6.0	7	7		0.05	0.20	7	-1.10	1.44
Item 2	69	5.52	1.23	1	5	6.0	7	7		0.05	0.22	6	-0.64	0.11
Item 3	69	4.30	1.60	1	3	4.0	6	7		0.07	0.37	4	-0.04	-0.70
Item 4	69	4.89	1.24	1	4	5.0	6	7		0.05	0.25	5	-0.42	0.20
Item 5	69	5.67	1.08	1	5	6.0	7	7		0.04	0.19	6	-0.62	0.17
Item 6	69	6.24	0.99	1	6	7.0	7	7		0.04	0.16	7	-1.50	2.73
Item 7	69	5.52	1.19	1	5	6.0	6	7		0.05	0.22	6	-0.77	0.82
Item 8	69	5.59	1.17	1	5	6.0	7	7		0.05	0.21	6	-0.64	0.15
Item 9	70	5.68	1.28	1	5	6.0	7	7		0.05	0.22	7	-1.02	1.00
Item 10	70	4.90	1.26	1	4	5.0	6	7		0.05	0.26	5	-0.28	-0.14
Item 11	70	5.80	1.08	1	5	6.0	7	7		0.04	0.19	6	-0.74	0.40
Item 12	70	5.27	1.24	1	5	5.0	6	7		0.05	0.24	5	-0.48	0.00
Item 13	70	5.10	1.25	1	4	5.0	6	7		0.05	0.24	5	-0.33	-0.16
Item 14	70	5.78	1.10	1	5	6.0	7	7		0.05	0.19	6	-0.85	0.50
Item 15	70	4.92	1.25	1	4	5.0	6	7		0.05	0.25	5	-0.33	-0.09
Item 16	70	4.57	1.23	1	4	5.0	5	7		0.05	0.27	5	-0.14	-0.13
Item 17	70	5.93	1.04	1	5	6.0	7	7		0.04	0.18	6	-0.90	0.60

Psychological Capital and Grit in Football and Handball Referees

Item	<i>N_{missing}</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>P₂₅</i>	<i>Mdn</i>	<i>P₇₅</i>	<i>Max</i>	Histogram	<i>SEM</i>	<i>CV</i>	<i>Mode</i>	<i>sk</i>	<i>ku</i>
CPC														
Item 1	74	4.93	0.83	1	4	5.0	5	6		0.03	0.17	5	-0.69	0.97
Item 2	74	4.39	0.98	1	4	4.0	5	6		0.04	0.22	4	-0.60	0.85
Item 3	74	4.92	0.82	2	4	5.0	5	6		0.03	0.17	5	-0.66	0.82
Item 4	74	5.11	0.87	1	5	5.0	6	6		0.04	0.17	5	-1.03	1.41
Item 5	75	5.03	0.89	1	5	5.0	6	6		0.04	0.18	5	-0.89	1.18
Item 6	75	5.33	0.84	1	5	6.0	6	6		0.03	0.16	6	-1.66	4.11
Item 7	75	4.53	1.11	1	4	5.0	5	6		0.05	0.24	5	-0.74	0.45
Item 8	75	4.74	0.93	1	4	5.0	5	6		0.04	0.20	5	-1.39	3.43
Item 9	75	4.86	1.18	1	4	5.0	6	6		0.05	0.24	6	-0.95	0.38
Item 10	75	4.83	0.85	1	4	5.0	5	6		0.03	0.18	5	-0.78	1.49
Item 11	75	5.13	0.76	1	5	5.0	6	6		0.03	0.15	5	-0.96	2.03
Item 12	75	5.02	0.86	1	5	5.0	6	6		0.04	0.17	5	-1.11	2.23
Grit-S*														
Item 1	73	3.82	1.10	1	3	4.0	5	5		0.05	0.29	5	-0.66	-0.40
Item 2	73	3.47	1.10	1	3	3.5	4	5		0.05	0.32	3	-0.23	-0.76
Item 5	73	3.81	1.10	1	3	4.0	5	5		0.05	0.29	4	-0.75	-0.15
Item 6	73	3.94	1.10	1	3	4.0	5	5		0.05	0.28	5	-0.87	-0.08
Item 9	73	3.88	0.88	1	3	4.0	5	5		0.04	0.23	4	-0.51	-0.08
Item 10	73	3.85	0.96	1	3	4.0	5	5		0.04	0.25	4	-0.57	-0.33
Item 11	73	4.38	0.73	1	4	5.0	5	5		0.03	0.17	5	-1.06	1.02
Item 12	73	4.39	0.70	1	4	5.0	5	5		0.03	0.16	5	-0.88	0.40
FSozUK-6														
Item 1	75	3.81	0.85	1	3	4.0	4	5		0.04	0.22	4	-0.55	0.46
Item 2	75	4.45	0.84	1	4	5.0	5	5		0.03	0.19	5	-1.69	2.86
Item 3	75	4.11	1.04	1	4	4.0	5	5		0.04	0.25	5	-1.27	1.18
Item 4	75	4.39	0.80	1	4	5.0	5	5		0.03	0.18	5	-1.24	1.12
Item 5	75	4.35	0.91	1	4	5.0	5	5		0.04	0.21	5	-1.63	2.64
Item 6	75	4.15	1.11	1	4	5.0	5	5		0.05	0.27	5	-1.32	1.01

*Items numbering from the 12 items version

4.1.2. Dimensionality

The PPS revealed a good fit to the data ($\chi^2(119) = 495.996$, $p < .001$, $n = 593$, $\chi^2/df = 4.168$, $NFI = .986$, $CFI = .989$, $TLI = .988$, $SRMR = .052$, $RMSEA = .073$, $P(\text{rmsea} \leq .05) < .001$, 90% CI [.067; .080]) however item 3 demonstrated a low factor loading ($\lambda_3 = .096$). A reduced model

without item 3 was tested ($\chi^2(104) = 481.846, p < .001, n = 593, \chi^2/df = 4.633, NFI = .986, CFI = .989, TLI = .987, SRMR = .054, RMSEA = .078, P(\text{rmsea} \leq .05) < .001, 90\% \text{ CI } [.071; .085]$).

The CPC-12 revealed a very good fit to the data ($\chi^2(50) = 114.864, p < .001, n = 588, \chi^2/df = 2.297, NFI = .990, CFI = .995, TLI = .993, SRMR = .041, RMSEA = .047, P(\text{rmsea} \leq .05) = .652, 90\% \text{ CI } [.036; .058]$). The item with the lowest factor loading was item 7 ($\lambda_7 = .358$) while all others $\geq .500$. All other structural weights presented high values ($\gamma_i \geq .772$).

The Grit-S revealed a good fit to the data ($\chi^2(19) = 124.243, p < .001, n = 590, \chi^2/df = 6.539, NFI = .986, CFI = .988, TLI = .983, SRMR = .063, RMSEA = .097, P(\text{rmsea} \leq .05) < .001, 90\% \text{ CI } [.081; .114]$). Both structural weights showed acceptable values ($\gamma_i \geq .622$).

The FSozUK-6 revealed a good fit to the data ($\chi^2(9) = 26.685, p = .002, n = 588, \chi^2/df = 2.965, NFI = .993, CFI = .995, TLI = .992, SRMR = .039, RMSEA = .058, P(\text{rmsea} \leq .05) = .271, 90\% \text{ CI } [.033; .084]$).

4.1.3. Reliability

The PPS items revealed satisfactory internal consistency ($\alpha = .94; \omega = .82$). The CPC-12 items presented satisfactory internal consistency values ($\omega_{L1} = .85; \omega_{L2} = .93; \omega_{\text{partial } L1} = .90$). The Grit-S items revealed marginally acceptable internal consistency values ($\omega_{L1} = .56; \omega_{L2} = .62; \omega_{\text{partial } L1} = .85$). The FSozUK-6 presented satisfactory internal consistency values ($\alpha = .86; \omega = .82$).

4.2. Structural model

4.2.1. Direct, indirect, and total effects

The structural model displayed an excellent fit to the data ($\chi^2(807) = 1,988.869, p < .001, \chi^2/df = 2.465, n = 573, NFI = .980, CFI = .988, TLI = .987, SRMR = .052, RMSEA = .051, P(\text{rmsea} \leq .05) = .358, 90\% \text{ CI } [.048; .053]$). The paths from Grit to Psychological Capital (H1; $\beta_{G \rightarrow PsyCap} = 0.225; p < .001$) and Social Support to Psychological Capital (H2; $\beta_{PsyCap \leftarrow SS} = 0.221; p < .001$) revealed statistical significance. Moreover, the path from Social Support to Grit presented statistical significance (H3; $\beta_{G \leftarrow SS} = 0.106, p = .027$). Additionally, statistical significance was also displayed in the paths from Proactive Personality to Psychological Capital (H5; $\beta_{PsyCap \leftarrow PP} = 0.554690; p < .001$); Proactive Personality to Grit (H6; $\beta_{G \leftarrow PP} = 0.608; p < .001$).

The analyzed mediations exhibited statistical significance namely Proactive Personality indirect effect to PsyCap via Grit (H4; $\beta_{PsyCap<-PP \times G<-PsyCap} = 0.137 ; p < .001$) and the Social Support indirect effect to PsyCap via Grit (H7; $\beta_{PsyCap<-SS \times G<-PsyCap} = 0.024 ; p = .035$).

The total effect also demonstrated statistical significance namely the Proactive Personality total effect to PsyCap via Grit ($\beta_{G<-PP+(PsyCap<-PP \times G<-PsyCap)} = 0.690 ; p < .001$) and the Social Support total effect to PsyCap via Grit. ($\beta_{G<-SS+(PsyCap<-SS \times G<-PsyCap)} = 0.244 ; p < .001$).

Table 4-2 displays the standardized factor weights (β) and their 95% confidence intervals.

Table 4-2 - Structural model paths

Direct Effects							
Latent Factor	Indicator	B	SE	Z	] 95% CI [	β	p-value
Grit	Proactive Personality	0.305	0.046	6.667	0.216; 0.395	0.608	< 0.001
Grit	Social Support	0.050	0.023	2.217	0.006; 0.095	0.106	0.027
Psychological Capital	Grit	0.506	0.104	4.884	0.303; 0.709	0.225	< 0.001
Psychological Capital	Proactive Personality	0.625	0.055	11.361	0.518; 0.733	0.554	< 0.001
Psychological Capital	Social Support	0.237	0.042	5.670	0.155; 0.319	0.221	< 0.001
Indirect Effects							
Path		B	SE	Z	] 95% CI [	β	p-value
Proactive Personality indirect effect	(PsyCap<-G \times G<-PP)	0.155	0.039	3.982	0.078; 0.231	0.137	< 0.001
Social Support indirect effect	(PsyCap<-G \times G<-SS)	0.026	0.012	2.109	0.002; 0.049	0.024	0.035
Total Effects							
Path		B	SE	Z	] 95% CI [	B	p-value
Proactive Personality total effect	PsyCap<-PP + (PsyCap<-G \times G<-PP)	0.780	0.048	16.360	0.687; 0.873	0.690	< 0.001
Social Support total effect	PsyCap<-SS + (PsyCap<-G \times G<-SS)	0.262	0.043	6.117	0.178; 0.346	0.244	< 0.001

4.2.2. Sports Moderation

Due to the limited size of the handball sample, the estimator was changed to MLR as WLSMV is more demanding in terms of sample size, and it would not allow the multi-group path testing. The multigroup full structural equation model revealed an unsatisfactory fit ($\chi^2(1,614) = 3,080.731, p < .001, \chi^2/df = 1.909, n_{football} = 470, n_{handball} = 103, NFI = .746, CFI = .859, TLI = .850, SRMR = .062, RMSEA = .056, P(rmsea \leq .05) < .001, 90\% CI] .053; .059[$). Table 4-3 shows the corresponding β s for the football referees and for the handball referees with their correspondent 95% confidence intervals. There were no statistically significant differences among sports for any of tested paths (Table 4-4). Presenting the absence of any statistically significant moderation on the tested paths.

Psychological Capital and Grit in Football and Handball Referees

Table 4-3 - Football and handball referees' structural model's paths

		Direct Effects							
Latent Factor	Indicator	<i>B</i>	<i>SE</i>	<i>Z</i>	] 95% CI [	β	<i>p</i> -value	Sport refereed
Grit	Proactive Personality	0.323	0.070	4.590	0.185; 0.461	0.652	< .001	Football	
Grit	Social Support	0.038	0.050	0.750	-0.061; 0.136	0.046	.454	Football	
Psychological Capital	Grit	0.357	0.134	2.662	0.094; 0.619	0.209	.008	Football	
Psychological Capital	Proactive Personality	0.501	0.070	7.121	0.363; 0.638	0.594	< .001	Football	
Psychological Capital	Social Support	0.299	0.076	3.942	0.150; 0.448	0.215	< .001	Football	
Grit	Proactive Personality	0.279	0.128	2.176	0.028; 0.530	0.576	.030	Handball	
Grit	Social Support	0.124	0.146	0.849	-0.162; 0.410	0.158	.396	Handball	
Psychological Capital	Grit	0.103	0.223	0.463	-0.334; 0.540	0.073	.643	Handball	
Psychological Capital	Proactive Personality	0.365	0.136	2.675	0.098; 0.632	0.536	.007	Handball	
Psychological Capital	Social Support	0.237	0.143	1.652	-0.044; 0.517	0.214	.098	Handball	
		Indirect Effects							
Path		<i>B</i>	<i>SE</i>	<i>Z</i>	] 95% CI [	β	<i>p</i> -value	Sport refereed
Proactive Personality indirect effect		0.115	0.052	2.229	0.014; 0.216	0.137	.026	Football	
Social Support indirect effect		0.013	0.019	0.721	-0.023; 0.050	0.010	.471	Football	
Proactive Personality indirect effect		0.029	0.063	0.458	-0.094; 0.152	0.042	.647	Handball	
Social Support indirect effect		0.013	0.028	0.457	-0.042; 0.068	0.012	.648	Handball	
		Total Effects							
Path		<i>B</i>	<i>SE</i>	<i>Z</i>	] 95% CI [	β	<i>p</i> -value	Sport refereed
Proactive Personality total effect		0.616	0.068	9.024	0.482; 0.750	0.731	< .001	Football	
Social Support total effect		0.393	0.076	4.122	0.164; 0.461	0.225	< .001	Football	
Proactive Personality total effect		0.313	0.117	3.361	0.164; 0.623	0.578	< .001	Handball	
Social Support total effect		0.249	0.135	1.841	-0.016; 0.515	0.226	.066	Handball	

Table 4-4 - Paths comparison between football and handball referees' structural model

		Direct Effects					
Latent Factor	Indicator	Football's β	Handball's β	$\Delta\chi^2$	Δdf	<i>p</i> -value	
Grit	Proactive Personality	0.652	0.576	0.091	1	.763	
Grit	Social Support	0.046	0.158	0.311	1	.577	
Psychological Capital	Grit	0.209	0.073	0.950	1	.330	
Psychological Capital	Proactive Personality	0.594	0.536	0.785	1	.376	
Psychological Capital	Social Support	0.215	0.214	0.148	1	.700	
		Indirect Effects					
Indicator		Football's β	Handball's β	$\Delta\chi^2$	Δdf	<i>p</i> -value	
Proactive Personality indirect effect		0.137	0.042	1.127	1	.288	
Social Support indirect effect		0.010	0.012	< 0.001	1	.984	
		Total Effects					
Indicator		Football's β	Handball's β	$\Delta\chi^2$	Δdf	<i>p</i> -value	
Proactive Personality total effect		0.731	0.578	2.693	1	.101	
Social Support total effect		0.225	0.226	0.165	1	.684	

CHAPTER 5 - Discussion

Sports refereeing is a complex task performed within a highly competitive and demanding context. Even with the introduction of technology into sports in hopes of assisting referees, as with video reviewing tools such as Video Assistant Referee technology — VAR, the referee remains an indispensable persona as the sports' inherent subjective laws interpreter. Divergence of opinions is certain under these circumstances, and controversy unavoidable which in many cases has unfortunately led to abusive behaviors towards the decision maker. Not solely but in great part due to these adverse conditions, multiple reports indicate high turnover levels, low recruitment results, and an increasingly more challenging task in retaining experienced referees, essential for the passing of knowledge to younger and less experienced officials (Ridinger, Kim, et al., 2017; Wicker & Frick, 2016).

As structural issues slowly materialize themselves with the lack of referees throughout the sporting fields, literature on the theme has been steadily growing (Aragão e Pina et al., 2018). Hence, referees are progressively being regarded as athletes of their own needing specific skills that must be trained and developed to achieve optimum performance, much so the athletes their decisions are inflicted upon in the sporting fields. While still under researched, referees' psychological facet is one of the prominent themes in the context owing to its critical importance in the role of refereeing. Thus, this study contributes to the literature in trying to understand how individual factors contribute to a referee's PsyCap and grit. Specifically, we investigated how proactive personality — relevant for game management (Aragão e Pina et al., 2019) – and perceived social support – directly correlated to performance and retention enhancing (Kellett & Shilbury, 2007) – influence PsyCap and grit within handball and football referees while also investigating whether there is a moderation effect of the sport refereed in the proposed model.

Support was found for the hypothesized positive relationship between grit and PsyCap (hypothesis 1 – H1), further demonstrating the relationship between the constructs, as acknowledged in previous research (K. W. Luthans et al., 2019). This result may accrue from some similitude between constructs as argued by Credé, Tynan, and Harms (Credé et al., 2017), more specifically between resilience (one of the key components that make up PsyCap) and grit. However, Kyle Luthans et al. (2019) supports Duckworth and Seligman (2017) view that there are key divergences between both constructs such as the multiple year commitment a gritty individual remains obligated to and not exclusively having resilience over short-term setbacks or the conscientiousness and self-control attributed to high level of grit. These

attributes may be indispensable for referees considering their careers must span along several years to reach elite competition levels adding to the already strenuous tasks a referee must perform in each match. Higher grit individuals were also found to have increased sport engagement and perceptual-cognitive expertise (Larkin et al., 2016) which should support a developmental path and, in turn, lead to improved performance however, further research is needed concerning this argument.

Perceived social support was investigated in this context and hypothesis 2 (H2) was successfully tested revealing a positive relationship between perceived social support and PsyCap confirming results achieved in other contexts (Avey et al., 2009; Nielsen et al., 2017). These results suggest that refereeing organizations should promote social relationships between referees and nurture a constant networking to improve their PsyCap. Indeed, referees' perceived social support and their social experiences have already been under research mainly concerning their stress-buffering effect on the inherently stressful activity of refereeing through the development of a sense of community and involvement (Warner et al., 2013). However, to our knowledge, this study is the first to research perceived social support as an antecedent to PsyCap in the refereeing context providing yet another environment where PsyCap may provide valuable inputs simultaneously displaying the multidisciplinary feature of the construct. A notable example of social networking promotion is group of activities organized by APAF such as ENA (Estágio Nacional de Arbitragem or National Encounter of Refereeing, in English) or ENAJ (Encontro Nacional do Árbitro Jovem or National Encounter of Young Referees, which English) consist in inviting referees for a weekend trip encouraging the sharing of knowledge and experience between top-level international referees and referees through talks, practical sessions, and informal gatherings. Such programs not only promote participation in the refereeing community as they may help tackle the retention problem the sector suffers as well as possible being a helpful recruiting asset through the trickle-down effect of role models (Wicker & Frick, 2016).

Hypothesis 3 (H3) concerning perceived social support relationship to grit was also investigated and results demonstrated a statistically significant path. Similar results were found regarding the indirect effect of perceived social support on PsyCap via grit (H4). Empirically, it is rather easy to understand that referees need support to overcome the challenges found in the pitch and to keep the motivation to perform week after week, match after match. Indeed, literature has regarded support networks as critical to referee retention since lack of support is one of the main discontinuation reasons (after abuse) (Kellett & Shilbury, 2007; Ridinger, Tingle, et al., 2017). Hence, in practical terms, a mentorship program for young referees may

be paramount for their continuance and should be implemented in any referee organization that wishes to reduce their turnover metrics. Moreover, while there is a referee who is ultimately responsible for the decisions taken, he is assisted by a team that besides helping in decision making and match control also supports the referee enhancing his confidence and concentration. Thus, advocating the creation of regular refereeing teams may relate to stronger ties between referees and be beneficial for their continuation and development.

The relationship between proactive personality to PsyCap was statistically significant in the hypothesized direction, as predicted by hypothesis 5 (H5). These results reassert Avey (2014) findings in the organizational context regarding the same relationship. Hypothesis 6 (H6) regarding proactive personality relationship to grit and hypothesis 7 (H7) concerning proactive personality indirect effect on PsyCap via grit also displayed statistically significant path. Hence, it seems that it is for refereeing organizations best interest to establish trait-based selection criteria to recruit or possibly promote into other competition levels individuals with potentially more sustainable high level of PsyCap and potentially, higher grit levels. Indeed, the developmental facet of PsyCap represents an opportunity to not only identify but to establish paths of intervention for performance development. In practical terms, it should be for referees' benefit to include in their season activities, regular psychological guidance, and interventions, if not personalized to each individual at least tailored for the activity of refereeing through the growing literature on the topic of which this study intends to contribute. Indeed, this research aims to further study PsyCap's pertinence in different contexts by expanding it into the sports' refereeing context and possibly provide arguments for its continued research and use of it in the sector.

Lastly, we investigated whether there is a moderation effect of the sport refereed in the proposed model (H8) and results show no statistically significant differences in the paths studied meaning that football and handball referees did not perceive the tested model differently.

CHAPTER 6 - Conclusion

Such as art, music, or any other cultural marker, sports are truly a cultural phenomenon. Indeed, football and handball promote a feeling of belonging and identity while simultaneously nurturing virtues of fairness, integrity, responsibility, and respect. Even though they may be played and refereed very differently, these values are transversal to football and handball, as for all sports. In fact, fairness is stated in football's laws (IFAB, 2021) to be a crucial foundation of the game and a vital feature of the *spirit of the game*. Thus, is born the referee character, out of the need for a *guardian of the sports law* that promotes its philosophy and enforces the rules in the hope of delivering fairer and more fluid contests as well as ultimately producing more entertaining matches for fans and all involved. As their popularity has grown, so has their economic and cultural importance accompanied by an increasing interest in the vital role that referees play within these sports. As such, research has progressively examined factors that shape the performance of referees, however, the psychological facet of referees has been considerably underresearched. Thus, this study intends to provide an original perspective into this matter by introducing PsyCap into the refereeing context intertwined with other constructs with the intent to expand and broaden the refereeing literature.

Supported on the individual constructs that compose PsyCap (i.e., HERO) having already been individually acknowledged and studied in sports referees' literature, on the relationships between those and desirable characteristics for optimum refereeing, and on the achieved results in this study, we argue that PsyCap may represent an adequate tool in the sports' refereeing context. Moreover, the study includes constructs such as grit, proactive personality, and perceived social support which we deem to be in line with "real life" experience. Hence, it provides *face validity* to the findings as a referee does require grit to persevere and maintain interest, a proactive personality to be efficient, and support to overcome the obstacles that may well arise. As such, we reckon to have provided a groundwork to consider in future research on the topic in the refereeing context.

Refereeing is one of the most challenging and difficult tasks in competitive sports. To be successful in this endeavor, a referee receives training that is just as applicable to broader society as it is in the sporting field. Referees learn to make difficult decisions under pressure, to manage and resolve interpersonal conflicts, to understand, interpret and apply rules equitably and fairly, to manage their stress and their emotions. Through training and experience, referees learn and develop these hard-to-master skills that one would argue, are as essential in a good human resource manager as they are valuable in everyday life.

6.1.1. Limitations and Future Research

This study has several strengths such as an exclusive and yet wide sample, and a model with several paths materialized through the eight formulated hypotheses; nevertheless, for transparency purposes to ignore its limitations would not be reasonable and thus, two are mentioned here. Firstly, each sample size provided a good picture of the population in focus as the data obtained integrated a substantial sample of referees in both sports, particularly considering the limited target population in the selected geography when compared to other more populated countries. However, the somewhat unbalanced aggregate between referees of each sport revealed itself challenging when analyzing the moderation effect of the sport. As such, future research may want to examine whether the findings presented here are reproduced within samples of other geographies and in more balanced sample sizes. For instance, specifically targeting different referee levels from novices to experienced and professional referees throughout distinct geographies may provide pertinent inputs as to the work and processes established in each organization and its results on referees' PsyCap and psychological resources.

Additionally, while the inclusion of the sport moderation between football and handball enriches the study, there were no differences among sports in the tested model suggesting that the tested model works equally independently of the refereed sport. Nevertheless, it should be mentioned that the fit of the multigroup model was not satisfactory. Future research may provide pertinent results by examining if the implementation of practical processes has the same impact on referees of different sports. Indeed, future research may want to build upon the work developed here and take PsyCap to a practical level by, for instance, exposing the results of longitudinal intervention programs on referees' PsyCap and its impact on their performance.

CHAPTER 7 - References

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Psychological Capital and Grit in Football and Handball Referees

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