

***Next match entrepreneurship –
Three studies exploring the career
transition from professional athletes to
entrepreneurs***

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Executive summary

With great interest, society watches sports stars' career transitions. However, not only famous Olympia winners and world champions have to reconsider their career paths in their younger years. All professional athletes, also those competing on a national level or top athletes proceeding niche sports, are confronted with the need for a completely different profession at some point in their sports career. Previous research finds a high intensity of entrepreneurship within the sports sector. Therefore, the question arises on what factors that high entrepreneurial density depends on. To better understand the specific starting position into career transition, support athletes on the way out of sports, and acknowledge the great potential of athletes with unique experiences, this dissertation is guided by the overall research question: *What affects the career transition of professional athletes into an entrepreneurial career?*

Following the short introduction, athletes are introduced as potential second career entrepreneurs. The current state of the literature on athlete entrepreneurship in 1.2 shows that athlete entrepreneurship should be considered an own sub-research stream in deferral to the existing research on sports entrepreneurship. Section 1.3 gives a graphical overview of three studies conducted within this dissertation and provides an overview of the sub-research questions addressing different aspects of the theory of planned behavior (TPB). After that, section 1.4 shows the structure and scope of this dissertation.

Study 1 in section 2 was co-authored with Andreas Kuckertz and Elisabeth S. C. Berger and addresses the suitability of top athletes as entrepreneurs. The big five personality traits (neuroticism, extraversion, openness for experience, conscientiousness, and agreeableness) and risk-propensity are investigated over top athletes (practicing low-risk or high-risk sport) and non-athletes. The results are analyzed with an analysis of variance (ANOVA) and post-hoc tests and compared to the personality traits associated with entrepreneurship. The explanatory comparison builds upon the person-job fit theory, showing the similarities between the athletes' and the entrepreneurs' careers. The matching personality traits lead to the conclusion that entrepreneurship might be an appropriate second career choice for athletes. The first study builds a basis for the following research in studies 2 and 3.

Study 2 in section 3 concentrates on the career transition process of top athletes into an entrepreneurial career. The explorative approach identifies numerous athlete entrepreneurs' drivers and barriers within eleven semi-structured interviews. Comparative causal mapping was used to identify commonalities clustered into skills and traits, outcome expectations, transitions conditions, and effects. Findings support selection as well as socialization processes of careers by retaining the person-environment fit. Furthermore, exploiting different

coping strategies on possible adversities is identified as a significant advantage for athlete entrepreneurs.

After identifying influencing factors on the career transition of athlete entrepreneurs, study 3 within section 4, co-authored with Celine Ströhle, concentrates on the role of resilience influencing entrepreneurial intention. Based on the assumption of athletes' higher resilience level than non-athletes, resilience is examined as a determining factor on entrepreneurial intention. First, an analysis of variance (ANOVA) shows a significant difference in the level of resilience between the two groups. The structural equation analysis supported the influence of resilience on entrepreneurial intention within the frame of the TPB for top athletes and non-athletes. Furthermore, the influence of perceived behavioral control on entrepreneurial intention was found significantly different between top athletes and non-athletes

Section 5 closes the dissertation by summarizing the main findings. Placing the findings in the overall context of this dissertation and highlighting the contributions to the research areas of athlete entrepreneurship, entrepreneurial career transition, and support programs and entrepreneurship education accentuates the pioneering role of this dissertation in the early development of a new vital research stream.

Zusammenfassung

Der Karriereübertritt von Leistungssportlern wird in der Gesellschaft mit großem Interesse verfolgt. Aber nicht nur berühmte Olympia-Gewinner oder Weltmeister müssen ihre Karriere in jungen Jahren überdenken. Auch Berufssportler auf nationaler Ebene oder Leistungssportler von Randsportarten sind damit konfrontiert, an einem gewissen Punkt in ihrer Sportkarriere einen komplett neuen beruflichen Weg einzuschlagen. Bisherige Forschung hat ein hohes Maß an unternehmerischer Aktivität im Sportsektor gezeigt. Es stellt sich die Frage, ob die hohe Dichte an Unternehmertum von den Hauptakteuren des Sports abhängt, den Athleten. Um die spezielle Ausgangssituation von Athleten besser zu verstehen, die Athleten im Übertritt zu fördern und auf ihr enormes Potenzial durch die einzigartigen Erfahrungen hinzuweisen, befasst sich diese Dissertation mit der übergeordneten Forschungsfrage: *“Was beeinflusst den Karriereübertritt von Athleten in eine unternehmerische Laufbahn?”*

Nach einer kurzen Einleitung, werden Leistungssportler als “second career entrepreneurs” eingeordnet. Der aktuelle Forschungsstand, dargestellt in 1.2, zeigt auf, dass Athleten-Gründertum als eigener untergeordneter Forschungsstrom von bestehender Forschung zu Sport-Gründertum abgegrenzt werden sollte. Abschnitt 1.3 führt neben einer grafischen Übersicht über die drei Studien dieser Dissertation die untergeordneten Teilforschungsfragen auf, welche unterschiedliche Aspekte der Theorie des geplanten Verhaltens (TPB) betrachten. Anschließend werden in Abschnitt 1.4 die Struktur und die Anwendungsbereiche der Dissertation aufgezeigt.

Studie 1 in Abschnitt 2 wurde gemeinsam mit Andreas Kuckertz und Elisabeth S. C. Berger erstellt und befasst sich mit der Eignung von Leistungssportlern als Unternehmer. Es wurden die big five Persönlichkeitsmerkmale (Neurotizismus, Extraversion, Offenheit für Erfahrungen, Gewissenhaftigkeit und Verträglichkeit) sowie die Risikoneigung von Leistungssportlern (von Sportarten mit niedrigem und hohem Risiko) und Nicht-Sportlern erhoben und mit einer Varianzanalyse (ANOVA) und post-hoc Tests analysiert. Die Ergebnisse wurden mit den Persönlichkeitsmerkmalen verglichen, die Unternehmern zugesprochen werden. Dieser explorative Vergleich basiert auf der Theorie der Passung zwischen Person und Arbeit und zeigt die Gemeinsamkeiten zwischen den Karrieren von Leistungssportlern und Unternehmern. Die übereinstimmenden Persönlichkeitsmerkmale führen zu dem Schluss, dass Unternehmertum eine geeignete Wahl für eine zweite Karriere von Leistungssportlern sein kann. Diese erste Studie der Dissertation bildet die Grundlage für die in Kapitel 2 und 3 folgenden Untersuchungen.

Die zweite Studie in Kapitel 3 konzentriert sich auf den Prozess des Karriereübertritts aus dem Leistungssport in das Unternehmertum. Mit dem explorativen Ansatz werden zahlreiche Treiber und Hindernisse über elf semi-strukturierte Interviews identifiziert. Mit der Methode

“comparative causal mapping” wurden Gemeinsamkeiten festgestellt, welche in Fähigkeiten und Eigenschaften, Ergebniserwartungen, Übertrittsbedingungen und Effekte gruppiert wurden. Durch das Einhalten des Person-Umwelt Fits unterstützen die Ergebnisse sowohl die Selektions- als auch die Sozialisationshypothese der Karriere. Außerdem wurden der Vorteil von Leistungssportlern herausgestellt, auf mögliche widrige Umstände verschiedene Bewältigungsstrategien zu entwickeln.

Nachdem Einflussfaktoren auf den Karriereübertritt von Athleten-Gründern gefunden wurden, konzentriert sich Studie 3 in Kapitel 4, die gemeinsam mit Celine Ströhle erstellt wurde, auf den Einfluss von Resilienz auf die Gründungsneigung. Basierend auf der Annahme eines erhöhten Resilienzlevels von Leistungssportlern verglichen mit Nicht-Sportlern, wird Resilienz als Einflussfaktor auf die Gründungsneigung untersucht. Zunächst zeigt die Varianzanalyse zwischen den beiden Gruppen einen signifikanten Unterschied im Resilienzlevel auf. Die Strukturgleichungsanalyse bestätigt den Einfluss der Resilienz auf die Gründungsneigung bei Leistungssportlern und Nicht-Sportlern unter Einbezug der Theorie des geplanten Verhaltens. Außerdem wurde ein signifikanter Unterschied in der Beziehung zwischen wahrgenommener Verhaltenskontrolle und Gründungsneigung zwischen Leistungssportlern und Nicht-Sportlern festgestellt.

Abschnitt 5 schließt die Dissertation mit einer Zusammenfassung der wichtigsten Ergebnisse ab. Die Ergebnisse werden in den Gesamtzusammenhang der Dissertation eingeordnet und der Beitrag zu den Forschungsgebieten Athleten-Gründertum, Karriereübertritt in das Unternehmertum sowie Förderprogramme und Ausbildung zum Unternehmertum werden herausgestellt. Dies zeigt die wegweisende Rolle dieser Dissertation in der frühen Entwicklung eines neuen und entscheidenden Forschungsgebietes.

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List of abbreviations

| | |
|-------|--------------------------------------------------|
| ANOVA | Analysis of variance |
| CSM | Social-cognitive model of career self-management |
| CCM | Comparative causal mapping |
| GEM | Global Entrepreneurship Monitor |
| PA | Personal attitude |
| PBC | Perceived behavioral control |
| RPS | Risk propensity scale |
| SCT | Social cognitive theory |
| SN | Subjective norm |
| TPB | Theory of planned behavior |

1 Introduction

Often individual entrepreneurial activity is built on professional experience acquired in previous jobs. Baucus and Human (1995) coined the term second-career entrepreneur, researching early retirees from large corporations who start a business. For many athletes, entrepreneurship is their second career. Athletes retire at a younger age but have gained specific experiences within their first career, shaping them as individuals and potential entrepreneurs. Within their quantitative research, Boyd, Harrison, and McInerney (2021) identified transferrable skills of athletes that are beneficial for future occupations, e.g., entrepreneurship. Ratten (2015) underlines top athletes' social, emotional, and leadership capital for entrepreneurship.

Nevertheless, athletes' experiences should not be considered one-dimensional, concentrating on the advantages. Also, disadvantages of athletes should be highlighted when it comes to career reorientation: While focusing on a sports career, education is often neglected. As a result, at the time of career transition, most athletes have lower professional experience besides the sport compared to others of the same age who did not concentrate on a sporting career (Zhang, Chin, & Clodt, 2018).

During the COVID-19 crisis, this multidimensionality of experiences came to light even clearer. Many start-ups faced immediate negative consequences such as reduced sales while remaining costs or unfavorable conditions for innovation. On the other hand, the crisis also led to opportunities that start-ups identified and pursued (Kuckertz et al., 2020). The sports industry and, therefore, athletes were strongly affected by a stoppage of sports events leading to financial losses (Ratten 2020). Besides canceled competitions, contact restrictions also led to limitations in the athletes' training, leading to high psychological distress of athletes (Håkansson et al., 2021).

As the crisis produced challenges and, on the other hand, opportunities, so does the sports environment for athletes. Opportunities can, for example, be based on the positive social capital of athletes (Ratten, 2015) and environmental factors (Pellegrini et al., 2020). Pellegrini et al. (2020) identified entrepreneurial characteristics of sportspeople (locus of control, situational control, discipline, resilience, teamwork capabilities) and different external factors influencing the entrepreneurial intention within their systematic literature review over 86 papers on sports entrepreneurship. For the group of top athletes, the research is still in its' infancy. Entrepreneurship is a popular second-career option for professional athletes (Kenny, 2015), and success as an athlete often translates into success as an entrepreneur (Bernes et al., 2009). First studies begin to explain the unique starting position of athletes in a new career as an entrepreneur (e.g., Li & Sum, 2017).

The purpose of this dissertation is to better understand the career transition of top athletes. The aim is to determine whether entrepreneurship is an attractive and suitable second career option for professional athletes and which factors promote and hamper the career transition. The dissertation is guided by the overall research question: *What affects the career transition of professional athletes into an entrepreneurial career?*

The remainder of this chapter proceeds as follows: in 1.1, athletes are introduced as one group of second career entrepreneurs. Athlete entrepreneurship will be introduced as a sub-stream of research of sports entrepreneurship within section 1.2. With showing the multi-perspectivity of sports entrepreneurship, the necessity for an own research stream of athlete entrepreneurship is presented. After defining the term athlete entrepreneurship, an overview of the current state of research is given. Chapter 1.3 will show the sub-research questions of this dissertation. Concluding the introduction, in section 1.4, an overview of the studies included is presented.

1.1 Athletes and second career entrepreneurship

Individuals are forced into occupational reorientation if the first profession is curtailed or limited. Various researchers have applied the dualistic distinction between opportunity and necessity entrepreneurship (e.g., van der Zwan et al., 2016; Block & Wagner, 2010; Hechavarria & Reynolds, 2009), especially after the Global Entrepreneurship Monitor (GEM) absorbed the respective items in 2001 (Reynolds et al., 2002). The GEM asks respondents whether necessity pushed them towards entrepreneurship (e.g., they had no other option to work), which is then considered as the best option available, or whether the decision to pursue a business opportunity was made even in light of available employment opportunities (Williams, 2008). Block and Wagner (2010) consequently operationalized the distinction based on why an individual left the previous job: an entrepreneur leaving voluntarily is considered an opportunity entrepreneur, and one leaving involuntarily (e.g., through being laid off) is considered a necessity entrepreneur.

Kerr and Armstrong-Stassen (2011) state that post-career entrepreneurship for older workers (meaning those over the age of 50) is influenced by both push and pull factors. However, in the case of limited first careers, that is, careers that will come to a natural end much earlier than when complete retirement from the job market becomes an option, the distinction between voluntarily and involuntarily is blurred and subjective. An indisputable involuntary example would be a severe career-ending injury for an athlete or an accident befalling an artist and causing irreversible health issues that restrict performance and curtail the career (Kenny, 2015). The situation would not be so straightforward for aging professional athletes. Getting

older means performance decreases, and health issues often materialize (Haupt et al., 2013). The athlete can actively decide whether to ignore pain and risk long-term physical damage or curtail the active career. This option to decide suggests that the distinction of voluntariness and involuntariness is more a decision-making continuum than a bipolar, unambiguous criterion. Research shows that different factors such as the voluntariness of retirement decisions affect the quality of athletes' career transition (Park, Lavallee, & Tod, 2013).

Lucas and Cooper (2012) show a positive relationship between the necessity of finding new work and entrepreneurial intention. However, the necessity to find a new profession (push-factors) and the opportunity perspective (pull factors) can either be external or internal factors, both influencing the entrepreneurial intent (Dawson & Henley, 2012). Lüthje and Franke (2003) researched the antecedents of entrepreneurial intent. They found personality traits (risk-taking propensity and internal locus of control) influencing the attitude towards entrepreneurship and identified attitude as the most critical factor influencing the entrepreneurial intention. In addition, the contextual factors (perceived barriers and perceived support) directly influenced the intention (Lüthje & Franke, 2003). A study of 3200 individuals laid off and forced to transition into a new work position also concluded that entrepreneurial intention is affected by both push and pull factors (Virick, Basu, & Rogers, 2015). Nevertheless, the correlations between contextual factors and entrepreneurial intention are still under-researched (Krueger, 2017).

1.2 Athlete Entrepreneurship as a research stream

Already in 1986, Hardy mentioned the challenge of entrepreneurship in the context of sport. Especially Vanessa Ratten is one of the most influential researchers shaping the field of sports entrepreneurship (Hammerschmidt et al., 2020). Also, Pellegrini et al. (2020, p. 802) identified Vanessa Ratten as the “most prolific and cited author in this field.” Analyzing 86 papers, four thematic clusters in sports entrepreneurship were found: “its theoretical definitions and internal factors fostering it (cluster 1), environmental factors may foster it (cluster 2), pedagogical approaches and education (cluster 3), and finally its impacts, especially in terms of community development and social benefits (cluster 4)” (Pellegrini et al. 2020, p. 795).

Definition

As the research field is constantly growing, more and more definitions for sports entrepreneurship emerge (Hammerschmidt et al., 2020). However, Hammerschmidt et al. (2020) criticize that Vanessa Ratten is the only researcher defining the term sports entrepreneurship, which might lead to misinterpretation (Bjärsholm, 2017). Table 1-1 shows definitions that can be found in prior literature.

Table 1-1 Definitions of Sports Entrepreneurship

Source: Development based on Hammerschmidt et al. 2020, p. 842

| Author | Definition of Sports Entrepreneurship |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ratten (2010) | "[...] is a sports-related organization acting innovatively in a business context" (p. 559). |
| Ratten (2011a) | "[...] is therefore the result of a process in which an organisation involved in sport acts entrepreneurially" (p. 315). "[...] is the process of creating value. This value includes the innovativeness, proactive nature and level of risk taking inherent in the activity" (p. 316). |
| Ratten (2011b) | "[...] any form of enterprise or entrepreneurship in a sport context" (p. 60). "[...] when an entity in sport acts collectively to respond to an opportunity to create value" (p. 60). |
| Ratten (2012) | "[...] is described as the mindset of people or organizations actively engaged in the pursuit of new opportunities in the sports-context" (p. 66). "[...] is any innovative activity that has a sports objective" (p. 67). "[...] is the set of values that influence an organizations or individuals propensity to create and develop innovative activities" (p. 67). |
| Ratten (2012b) | "[...] is the entrepreneurship leading to the establishment of new sports-related enterprises and the continued innovation of existing sports organizations" (p. 2). |
| Ratten and Ferreira (2016) | "[...] is innovative, risk-taking and proactive behaviour in the sports-related industry" (p. 244). |
| Ratten (2018) | "[...] is defined as developing new start-ups or ventures that engage with sport" (p. 13). "A more refined definition [...] is the exploitation of opportunities within the sports sector to create change" (p. 13). |
| Hammerschmidt et al. (2020) | "[...] the process by which individuals, acting in a sports environment, pursue opportunities without resources currently controlled" (p. 842). |

Pelligrini et al. (2020) define sports entrepreneurs as “(a) persons often highly engaged with a sport (Ranfagni & Runfola, 2018), (b) that desire to turn their passion or former profession into a new career (Ratten & Jones, 2018), (c) characterized by an entrepreneurial mindset and thus more capable than the average person to identify and seize opportunities emerging in the environment (Ratten & Miragaia, 2020), (d) and interested in motivating other people in starting to practice a sport discipline (Wicker, Breuer, & Pawlowski, 2009)” (pp. 815 f.). This summarizing definition includes two essential perspectives: being a former professional athlete and being an entrepreneur in the sports section. Although having a lot in common, both focal points on the phenomenon should be differentiated. This dissertation concentrates on athletes as second career entrepreneurs. For implementing the distinction, the term athlete entrepreneurship is suggested as a sub-area of research. Whereas sports entrepreneurship focuses on the branch of sport, the anchor around the research of athlete entrepreneurship is the athlete as an individual. Taking the entrepreneurial track as a second career choice during or after the active career as a professional athlete defines the athlete entrepreneur.

The term athlete has first to be defined to describe the athlete entrepreneur. The three studies made within this dissertation project researched athletes on a top-level, specified by the following criteria: “(1) the frequency of training and participation in competitions with a focus on winning, and [either] (2a) the participation in international high-level competitions, [or] (2b) the affiliation to a squad (Steinbrink, Berger, & Kuckertz, p. 866).” (3) In addition, athletes pursuing the sport as a career path and having the main paid occupation with being a professional athlete were also classified as top athletes. Therefore, athlete entrepreneurs are defined as individuals who pursue an entrepreneurial career besides or after their active career as a top athlete.

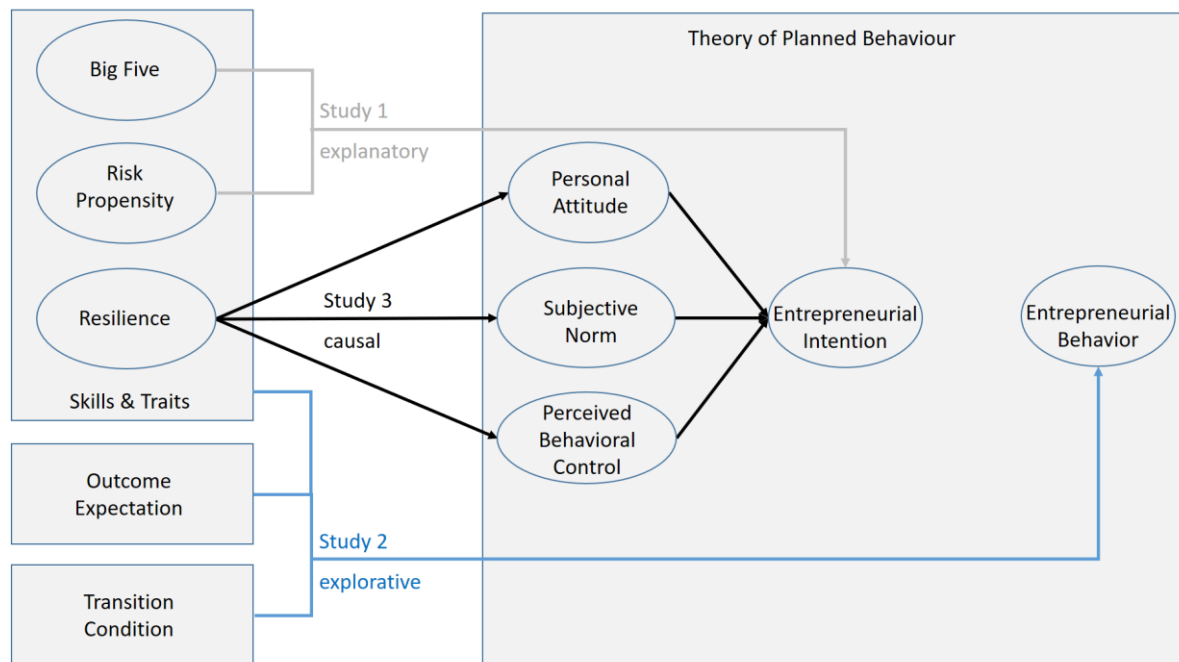
1.3 Purpose of this dissertation

As explained above, sports entrepreneurship is researched from different perspectives and with different research objectives, having one thing in common: research seems to be a patchwork, most on a theoretical or qualitative basis. Therefore, future research on different perspectives of sports entrepreneurship is recommended (Hammerschmidt et al., 2020). This dissertation aims to give a deeper understanding of the athletes’ career transition into entrepreneurship. To achieve that goal, the above-mentioned overall research question will be answered by in-depth research questions within three studies to contribute to the ongoing discussion.

The research questions of all three studies are connected with the anchor point of the career transition of professional athletes. As figure 1-1 shows graphically, study 1 follows an

explanatory approach, connecting the big five personality traits and risk propensity with the entrepreneurial intention of athletes as the best predictor for actual entrepreneurial behavior. Based on interviews and analysis with comparative causal mapping (CCM), study 2 identifies the causes related to the actual entrepreneurial behavior. Study 3 examines the specific relation of the trait resilience on the entrepreneurial intention with a causal approach. The causal correlations have to be considered as interpreted. The topic of causality will be discussed deeper within the limitations in section 5.4. The structural equation analysis integrates the TPB and researches the model in general and with a multigroup comparison between top athletes and non-athletes to get a deeper understanding of causal relations and their differences between athletes and non-athletes.

Figure 1-1 Graphical overview of the studies included in this dissertation



Although the timeline and the reasons leading to that decision vary between individuals and the kind of sports, the career as a top athlete is limited. Getting older leads to decreasing performance and often health issues (Haupt et al., 2013). An accident might also be a possible career-ending pushing towards a new career. Also, financial reasons could be considered a push factor, highly depending on the individual situations of athletes. Professional athletes might have fixed contracts depending on the kind of sport they pursue. Young and promising professional football players, for example, are usually offered contracts spanning several years. In contrast, athletes specializing in less popular sports often do not have any

employment contracts and instead have to apply for state funding annually or fund themselves through acquiring sponsorship.

The question about the time after sports sometimes already emerge during their career, but latest after ending it. At some point, every athlete is forced to reorientate professionally and choose a second career. As mentioned earlier, the entrepreneurial path is a popular second-career choice of professional athletes (Kenny, 2015) and seems to fit former athletes for different reasons. To better understand the fit of top athletes, study 1 investigates the personality traits of top athletes and compares them to the typical personality profile of entrepreneurs. The explanatory approach builds on the theoretical frame of the person-job fit theory, stating compatibility if the individuals' abilities and job demands are matching (Kristof, 1996). The set of traits is more homogenous in higher levels of competitive athletes considering the self-selection bias (Silva & Weinberg, 1984).

Therefore, assuming a self-selection process of athletes, athlete entrepreneurship seems a desirable and suitable second career choice. Hence, study 1 aims to answer the research question of whether top athletes are more suited to entrepreneurship than non-athletes based on their personality traits; and if so, whether there are further differences between athletes based on the risk class of the sport being practiced.

As mentioned above and supported by study 1, athletes fit well for an entrepreneurial career. Therefore, the second study goes deeper into professional athletes' actual career transition process. The social cognitive theory (SCT) of Bandura (1986) indicates that former career experiences, such as being a professional athlete, shape individuals and influence career decisions. However, current literature on athletes' career transition is often theoretical. For example, Hindle et al. (2021) theorize the possibility of transferring social capital from a sports career to an entrepreneurial one. Besides social capital, top athletes also bring emotional and leadership capital for entrepreneurship (Ratten, 2015), which is expected to be transferred and influences career decisions.

Therefore, the second study identifies commonalities of athletes who have already taken the entrepreneurial path. Semi-structured interviews reveal numerous influencing factors as relevant learnings, environmental conditions, and expectations built within a professional athlete's career that are helpful or hindering for entrepreneurship. With the method of CCM, causal relations concurring over four or more athletes reveal a model with causal relations around the anchor topic of career transition. The method of CCM strengthens the explanatory power of the data qualitatively gained. Therefore, this study aims to understand the transition conditions in terms of drivers and barriers to the career transition of professional athletes into an entrepreneurial career and what effects follow the career transition.

The influencing factor on the second career decision mentioned the most often in study 2 was resilience. The research does not claim resilience as the only factor explaining entrepreneurial intention. It is assumed that influencing factors vary individually and maybe also between the kinds of sport. Nevertheless, a specification is needed to understand better the exact causal relations explaining the entrepreneurial intention. The number of variables is limited to achieving a good model fit. It has to be mentioned that the group of top athletes is a small population, and a high number of participants is not easy to gather, especially when staying within one organizational system of the sport. In every country, sports promotion is organized differently (Vaeyens et al., 2009), so for this study, Germany was chosen. Prior research identified resilience as a key trait of athletes (Westmattelmann et al., 2021) and a key competence of entrepreneurs (D'andria, Gabarret, & Vedel, 2018), supported by study 2. All eleven interviewees mentioned that resilience positively influences life as an entrepreneur.

Therefore, the research questions of study 3 are: Is resilience a determining factor on entrepreneurial intention, and is this relation mediated by the TPB? Can the suggested model be applied in general and for specific groups with a high level of resilience?

1.4 Structure and scope of this dissertation

This dissertation consists of three empirical studies that add knowledge to the specifics of the career transition of professional athletes into an entrepreneurial career. An overview of the dissertation's studies is given in Table 1-2. In the following paragraphs, the three studies will be introduced briefly, including research questions, theoretical background, applied methods, and key findings of each study.

Table 1-2 Summary of the studies included

| Study | Research question(s) | Theme(s) | Theoretical base | Method(s) | Key Findings |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Study 1: Top athletes' psychological characteristics and their potential for entrepreneurship | Are top athletes more suited to entrepreneurship than non-athletes based on their personality traits? Are there further differences between athletes based on the risk class of the sport being practiced? | The influence of personality traits on the entrepreneurial intention of top athletes | Person-Job fit Theory Big Five Personality Traits | Analysis of variance and post-hoc tests Explanatory approach | - Personality traits match the detected directions for entrepreneurial intention and success - Appropriateness of an entrepreneurial career for athletes |
| Study 2: Second career entrepreneurship: analyzing the career transition of professional athletes | What drivers and barriers on the career transition of professional athletes into an entrepreneurial career can be identified and to what effects leads the career transition? | Causes and effects around the career transition (entrepreneurial behavior) of top athletes into an entrepreneurial career | Social cognitive theory Social cognitive career theory Social-cognitive model of career self-management | Comparative causal mapping | - Causes: skills & traits, outcome expectations, transition condition - Development of coping strategies - Staying in familiar surroundings - Influence of selection and socialization on the career transition process |
| Study 3: The entrepreneurial intention of top athletes – does resilience lead the way? | Is resilience a determining factor on the entrepreneurial intention, and does the theory of planned behavior mediate this relation? Can the model be applied in general and for the group of top athletes? | Resilience as an influencing factor on the entrepreneurial intention of top athletes and non-athletes | Theory of Planned Behavior | Analysis of variance Structural equation modeling (AMOS) | - Indirect influence of resilience on the entrepreneurial intention, mediated by the explaining factors of the TPB (personal attitude, subjective norm, perceived behavioral control) - Difference in the influence of perceived behavioral control on the entrepreneurial intention between top athletes and non-athletes |

The first study, "*Top athletes' psychological characteristics and their potential for entrepreneurship*," is presented in chapter 2, examining the suitability of athletes for an entrepreneurial career.

Risk-taking propensity is a key trait for entrepreneurship (Hyrsky & Tuunanen, 1999). Nevertheless, other personality traits were also related to entrepreneurial intention and success (Zhou et al., 2019). Therefore, based on the person-job fit theory, it is expected that both the intention and the ability for entrepreneurship are high for professional athletes.

It is hypothesized that differences between high-risk athletes, low-risk athletes, and non-athletes exist in the big five personality traits and the risk propensity. Data of 31 high-risk top athletes, 36 low-risk top athletes, and 43 non-athletes were collected to test the hypotheses. The variables of the big five (neuroticism, extraversion, openness for experience, conscientiousness, and agreeableness) were measured with the short version of the inventory by Rammstedt and John (2005). To measure the "everyday risk-taking behavior," the propensity scale (Meertens & Lion, 2008) was applied. The data analysis was conducted with an ANOVA and a post-hoc test of variance. Significant differences between the groups were observed for neuroticism, extraversion, conscientiousness, and risk propensity, whereas openness and agreeableness were not. By comparing the results to the typical profile of an entrepreneur (Zhao, Seibert, & Lumpkin, 2010), commonalities based on the personality traits of top athletes and entrepreneurs are analyzed on an explanatory basis. Results show that the entrepreneur and the athlete are less neurotic, more extroverted and conscientious, and exhibit a higher risk propensity level than the other reference groups. Summarizing, findings suggest the eligibility of top athletes as entrepreneurs based on personality traits.

The second study, "*Athlete entrepreneurs: the career transition of professional athletes taking the entrepreneurial track*," is presented in chapter 3.

According to the social cognitive theory, individuals constantly learn within their social environments (Bandura, 1986). The social environment of professional sport is a particular one that is expected to lead to unique experiences. For identifying positive and negative aspects affecting athletes, this study analyses top athletes who have already successfully transitioned into entrepreneurship. Semi-structured interviews with eleven active and former high-level athletes who already took the entrepreneurial path beside or after the active career as an athlete was conducted, coded, and analyzed. The explorative research on successful transitions identifies positive or negative causal relations on the career transition and effects following the transition act. Guided by the social-cognitive model of career self-management (CSM) (Lent & Brown, 2013), the results are clustered in three main areas for causes: (1) skills & traits, (2) transition condition, (3) outcome expectations. In addition, the effects of the career transition were grouped. The multidimensional person-environment fit compares the fit

between individuals and their environment (Jansen & Kristof-Brown, 2006; van Vianen, 2018). Study 1 already discussed the person-job fit as one dimension of person-environment fit, which is confirmed and complemented with further perspectives in study 2. The results show that keeping fit is an essential individual driver towards entrepreneurship, as is the development of different coping strategies.

To get a more profound knowledge about the coping strategies identified in study 2, the third study, *“The entrepreneurial intention of top athletes – does resilience lead the way?”* is presented in chapter 4. Study 3 focuses on the trait mentioned the most often within study 2: resilience. The intention is the best predictor for actual behavior (Ajzen, 1991), and therefore, the TPB was applied better to understand the interdependencies between resilience and entrepreneurial intention. The study investigates 337 individuals, of which 195 were coded as top-athletes and 142 as non-athletes. First, it is hypothesized that resilience and entrepreneurial intention are higher for athletes than non-athletes. Following, a relationship of resilience on the entrepreneurial intention, mediated by the TPB, is expected. Finally, to better understand the specifics of top athletes compared to non-athletes, the differences in the model's relationships between both groups are hypothesized. For testing the hypotheses, data were collected with an online survey, including the TPB measured with the 10-Item short version of the CD-RISC (Campbell-Sills & Stein 2007) and the risk propensity scale (RPS) measuring risk propensity (Meertens & Lion, 2008). As control variables, entrepreneurial background and experience were asked binary. This confirmatory research first analyzes the difference in resilience and entrepreneurial intention with an analysis of variance. Second, the structural relations between resilience and entrepreneurial intention, mediated by the antecedents of the TPB, were built and tested with structural equation modeling (Byrne, 2010). The structural equation modeling method includes several structural regression equations and the possibility to model the relations graphically. Simultaneous analysis of the hypothesized model tests consistency with the data (Byrne, 2010). For testing the differences between top athletes and non-athletes, a multigroup comparison of the structural model was conducted. The results show an indirect influence of resilience on the entrepreneurial intention, mediated by the explaining factors of the TPB. Therefore, the research confirms the TPB with the factors of personal attitude, subjective norm, and perceived behavioral control explaining the entrepreneurial intention in general and for the group of top athletes. The findings suggest a difference in the influence of perceived behavioral control on the entrepreneurial intention between top athletes and non-athletes. High confidence in the ability to face adversities and cope with uncertainties leads to the recommendation of strengthening athletes' risk awareness and management.

The dissertation closes with chapter 5. Structured according to affected research fields of athlete entrepreneurship, entrepreneurial career transition, and support programs and

entrepreneurship education, the dissertation's theoretical and practical contribution is presented.

2 Top athletes' psychological characteristics and their potential for entrepreneurship

Authors

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Abstract

The role of personality traits as predictors of entrepreneurial intention and success has been widely researched. This article investigates the personality traits of top athletes practicing low-risk and high-risk sports and, based on the person-job fit theory, compares them to the personality traits commonly associated with entrepreneurship. To achieve this aim, the big five personality traits and risk propensity of 43 non-athletes, 36 top athletes practicing a low-risk sport, and 31 top athletes practicing a high-risk sport are measured and analyzed with an analysis of variance (ANOVA) and post-hoc tests. Furthermore, an explanatory approach is used to explain the similarities between the athletes' and the entrepreneurs' careers. The results show top athletes' personality traits match the detected directions for entrepreneurial intention and success, and the discussion examines whether entrepreneurship might be an appropriate second career choice for athletes. This study is based on data gathered from high-level competition athletes and thus makes it possible to draw inferences on the eligibility of athletes to become entrepreneurs based on their personality traits. The findings also signal the need for focused entrepreneurship education as well as an awareness among potential investors and future employers who could facilitate professional athletes becoming entrepreneurs and intrapreneurs.

Keywords

Personality traits, Big five, Risk propensity, Top athletes, Sportentrepreneurship, Athlete entrepreneurship, Person-job fit theory

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2.1 Introduction

Even successful professional careers in sport are short and therefore, most top athletes must consider having a second career (Kenny, 2015); some among them will consider entrepreneurship an interesting option. The entrepreneurial propensity of top athletes might be explained by the simple logic that the professional field of sport offers various business opportunities for self-employment (Ratten, 2015).

Alongside other factors, such as the environment and human capital like education and experience, personality is another aspect of the complex model of entrepreneurship (Brandstätter, 2011; Brändle et al., 2018). Entrepreneurs' personality traits have been studied in various contexts; for example, that of the tasks required of entrepreneurs (Rauch & Frese, 2007), and in comparison to managers (Zhao, Seibert, & Lumpkin, 2010; Stewart & Roth, 2001), and most research concentrates on discerning who becomes an entrepreneur and who goes on to be successful (Zhou et al., 2019). Prior research in this area has theoretically established similarities in both the job profiles and personality traits of entrepreneurs and top athletes, but specific empirical research on the connection is scarce.

Kristof-Brown, Zimmerman, and Johnson (2005) investigated the fit between a person and the working environment in a meta-analysis. According to the person-job fit theory as one part of the individuals' fit at work, people and their jobs are compatible when a job's demands and the person's abilities and/or job supplies (i.e., opportunities and resources a job offers to a person), fit the individual's needs (Kristof, 1996). Supported by the person-environment fit, the choice for the subject of sport might be a self-selection process triggered by future career choices.

This paper aims to answer the research question of whether top athletes (competing on a high level) are more suited to entrepreneurship than non-athletes based on their personality traits; and if so, whether there are further differences between athletes based on the risk class of the sport being practiced. The study thus answers the call of Ratten and Tajeddini (2019) for more research on personality traits in the sports entrepreneur context.

To further develop prior findings in the academic literature on personality traits and to focus on top athletes, the results of the athletes' personality analysis will indicate the characteristics of the personality traits neuroticism, extraversion, openness to experience, conscientiousness, and agreeableness, and also their risk propensity. Applying the person-job fit theory would lead one to assume that athletes are likely to be attracted to and successful in entrepreneurship; an assumption that we elaborate on below.

To address the research question of whether top athletes are better suited to entrepreneurship than non-athletes, we collected data on a sample of top athletes and then categorized the sample group as participating in a high-risk or a low-risk sport (to aid brevity we often refer to

high-risk-sport athletes or low-risk-sport athletes). We assessed a sport as high-risk if pursuing it involves a high risk of accident and qualified such accidents as potentially having serious health consequences. Ratten's (2015) work on sports entrepreneurship focusing on the athlete as an entrepreneur indicates that the personality traits of professional athletes match those of entrepreneurs. Following the analysis of the athletes' personality traits, an explorative research design addresses additional considerations. The personality traits of top athletes from both sports risk classes and those of non-athletes are then compared to the picture for entrepreneurs elicited from prior research.

2.2 Theoretical background

Personality traits

The entrepreneurship literature suggests specific personality traits related to entrepreneurship that include the need for achievement, generalized self-efficacy, innovativeness, stress tolerance, the need for autonomy, and a proactive personality (Rauch & Frese, 2007). The broad personality traits known as the *big five* help populate the five-factor model to offer a general approach to understanding personality and can help to elicit an unbiased and context-independent picture. The model has been developed continuously almost since its introduction and is now a well-validated and accepted model in psychology that is used in various contexts and research areas to measure personality traits. Costa and McCrae (1992) provided a framework to examine personality traits across cultures and individuals, and various empirical studies in different research fields have followed since. Conclusions on the relationship between personality and entrepreneurship, however, have been weak and inconsistent, perhaps owing to research focusing on selected variables, such as the relation between openness to experience and entrepreneurial intention (Zhou et al., 2019). Meta-analyses conducted in the entrepreneurial context have examined issues like the relatedness of personality patterns and personality levels (Zhou et al., 2019), personality traits (Kerr, Kerr, & Xu, 2018), or specifically the relation of the big five personality traits (Zhao, Seibert, & Lumpkin, 2010) to entrepreneurial intentions and firm performance. Whereas in the context of sport psychology, more specified relations and subgroups are examined, such as comparing the big five personality traits of people pursuing individual or team sports (Nia & Besharat, 2010) and of individuals participating in organized sport compared to individuals who do not (Allen, Greenleese, & Jones, 2013).

There is no clear consensus on whether risk behavior is an independent personality trait (Zhao, Seibert, & Lumpkin, 2010) or can be explained as a combination of the big five traits (Brandstätter, 2011; Nicholson et al., 2005; Gullone & Moore, 2000; Zuckerman & Kuhlman,

2000). It is important to note that studies differ in the way they explain risk behavior. For example, Castanier, Le Scanff, and Woodman (2010) examined sport-specific risk behavior rather than general risk behavior, and Zhao, Seibert, and Lumpkin (2010) stated that the personality construct of risk propensity is very important for entrepreneurship research but is underrepresented within the big five model, and accordingly, viewed risk propensity as an independent trait in the entrepreneurial context alongside the big five. Such risk propensity is defined as the individual's general tendency to take risks (Meertens & Lion, 2008). By measuring the risk propensity of athletes and entrepreneurs, it is possible to compare how both groups understand and deal with personal risk.

Personality linked to entrepreneurial intention and success

Several empirical studies have aimed to distinguish the personality of individuals with high levels of entrepreneurial intention and high-performing entrepreneurs from that of other groups such as managers or employees. Kerr, Kerr, and Xu (2018) stated that most literature to date asks if certain personality traits predict the likelihood of becoming an entrepreneur and then of success as an entrepreneur. Zhao and Seibert (2006), analyzing 23 studies from 1960 to 2002 concluded that entrepreneurs are more emotionally stable, similarly extraverted, more open to experience, more conscientious, and less agreeable than managers in general. Zhao, Seibert, and Lumpkin (2010) analyzed the relationship of the big five personality traits and also risk propensity with entrepreneurial intention and performance. The results reveal a significant relationship between the big five personality traits (neuroticism, extraversion, openness, conscientiousness, and agreeableness) and intention and performance. Risk propensity was only related to intention and agreeableness to neither. Munir, Jianfeng, and Ramzan (2019) examined the impact of risk propensity on the dimension of the theory of planned behavior, which explains entrepreneurial intention. Risk propensity had a positive impact on all three dimensions (attitude to entrepreneurship, subjective norms, and perceived behavioral control), but no significant impact directly on entrepreneurial intention.

Kerr, Kerr, and Xu (2018) conducted a meta-analysis of studies from 2000 to 2017 addressing the personality of entrepreneurs. The study highlights the inconsistent results in different studies and suggests they might be explained by the different environments in which the studies were conducted (e.g., there was a cultural or industry influence). The same study also suggests opportunity-driven and necessity-driven entrepreneurs might typically have different personality traits. Kerr, Kerr, and Xu (2018) encourage further investigation of the personality traits of different subgroups that might reveal possible context-specific effects.

Personality traits linked to top athletes

First, it is important to note that both what is defined as a high-risk sport and the suggestions of who participates in such sports differ greatly across studies. Tok (2011, p. 1107) for example

investigated the big five personality traits among individuals actively participating in adventure/risky sports “on a regular basis” but also individuals with only a predisposition for, but no actual previous experience in, one group called the “active adventure/risky sport participant group”. Compared to non-participants, regular participants had a lower level of neuroticism and conscientiousness and higher levels of extraversion and openness; differences in levels of agreeableness between the groups were not significant. Allen, Greenless, and Jones (2013) inter alia investigated the differences between athletes competing at a higher level (i.e., in national and international competitions) and athletes competing at a lower level (i.e., in university or club competitions) and found that top athletes competing at a higher level scored lower on neuroticism and higher on conscientiousness and agreeableness.

It is suggested that risk-taking as a personality trait is linked to engagement in risky sports. Freixanet (1991) examined personality traits between three different groups of men active in sport with high physical risk and a control group of men who were not engaged in risky sports and found that extraversion was higher and neuroticism lower among the risky sports group. Diehm and Armatas (2004) compared the levels of sensation seeking and openness to experience between surfers (a high-risk sport) and golfers (a low-risk sport) and concluded that surfers have a higher level of sensation seeking and openness to experience.

Similarities between athletes and entrepreneurs

As shown above, the previous research indicates that specific personality traits can signal the level of entrepreneurial intention and success. Both groups of subsamples, be that people who are considering becoming an entrepreneur or those who undertake physical activity, share certain personality traits. They are found to be more emotionally stable, more extraverted, more open (e.g. Zhao, Seibert, & Lumpkin, 2010; Tok, 2011), predominantly more conscientious (e.g. Zhao, Seibert, & Lumpkin, 2010; Allan, Greenleese, & Jones, 2011) and also to predominantly have a greater propensity for risk (e.g. Zhao, Seibert, & Lumpkin, 2010; Diehm & Armatas 2004). The results for agreeableness are ambiguous in the previous research.

Sport and entrepreneurship can be linked from both the contextual and the individual perspectives. The research around sport-based entrepreneurship is evolving (e.g., Ratten, 2010, 2011; Hemme, et al., 2017), and Ratten (2012, p. 66) describes sports entrepreneurship as “the mindset of people or organizations actively engaged in the pursuit of new opportunities in the sports-context”. This linking of entrepreneurship and sport management research is a promising field for research and practice as entrepreneurial activity is found with great density in the sector of sport (Hammerschmidt et al., 2019). Following, the individual perspective focuses on the personality of top athletes as a focal point for engaging in entrepreneurial activity. Various studies and meta-analyses investigate the personality traits of entrepreneurs

and conclude that people are more attracted to entrepreneurship when they perceive the demands and requirements of the job fit their own personality traits (e.g., Zhao, Seibert, & Lumpkin, 2010). In addition, prior studies on the personality of athletes indicate the same combination of personality traits is present in athletes and entrepreneurs. Based on the person-job fit theory, the demands and requirements that the activities of entrepreneurs and athletes place upon them will be assessed.

Neuroticism. Entrepreneurs and athletes are confronted with uncertainty and need to address that by tapping into emotional stability. Bryan, O'Shea, and MacIntyre (2019) conducted a systematic review that reveals the relevance of resilience in both work and sports contexts. Gottschling et al. (2016) found a strong negative relation between neuroticism and resistance to stress. Both athlete and entrepreneur must build the resilience to perform under pressure and both have to deal quickly with failure and do so in an emotionally stable manner.

H1: There is a difference in neuroticism between non-athletes, top athletes involved in a low-risk sport, and top athletes involved in a high-risk sport.

Extraversion. Optimistic athletes were found to be less exhausted – emotionally and physically – than less optimistic athletes (Gustafsson & Skoog, 2012). Both need to have an optimistic attitude and to be drawn by the excitement and stimulation of taking the risks involved in their chosen careers. That seems self-explanatory for the athlete practising a high-risk sport, but the different kinds of risk detailed below explain the need for all athletes and entrepreneurs to maintain an optimistic attitude. Furthermore, a high level of energy and assertiveness is required because of the demanding physical and psychological requirements of both jobs.

H2: There is a difference in extraversion between non-athletes, top athletes involved in a low-risk sport, and top athletes involved in a high-risk sport.

Openness to experience. Athletes have to be innovative, for example, in terms of their training routine or developing new artistic elements (Ratten, 2018). This willingness and proclivity to change is accompanied in the case of both athletes and entrepreneurs by heightened levels of opportunity recognition and imagination. In addition, both might have a tendency to follow an unconventional lifestyle with regard to their work and leisure time and their income. This applies especially when top athletes do not have access to university scholarships and have to invest money to pursue their chosen sports career, as is the case for instance in Germany.

H3: There is a difference in openness between non-athletes, top athletes involved in a low-risk sport, and top athletes involved in a high-risk sport.

Conscientiousness. The high workload of both entrepreneurs and top athletes demands a high level of achievement motivation. Athletes also have to deal with extraordinary physical strain in addition to committing their time. Of course, entrepreneurs might also suffer from physical

consequences after a long period of engaging in exploitation activity. In addition to having a strong achievement motivation, both entrepreneurs and athletes must maintain a clear orientation towards their targets, the persistence to achieve those targets, and must count dependability among their personal traits.

H4: There is a difference in conscientiousness between non-athletes, top athletes involved in a low-risk sport, and top athletes involved in a high-risk sport.

Agreeableness. This dimension is certainly worth discussing. The entrepreneur needs to be self-centered, has to accept the likelihood of facing conflict, and be able to act ruthlessly when the survival of the firm demands it. Athletes participating in an individual sport also have to fight to achieve their best performance and win. In a team sport, the team spirit would mitigate that self-centered thinking. The affiliation to a team or squad, even in an individual sport, might also influence the level of egocentricity. Various parallels can be found in both job characteristics. The parallels identified above prompt the following hypothesis.

H5: There is a difference in agreeableness between non-athletes, top athletes involved in a low-risk sport, and top athletes involved in a high-risk sport.

Risk Propensity. There are different kinds of risks the entrepreneur and the athlete have to accept. Nicholson et al. (2005) measured risk propensity by dividing it into six domains: recreation (e.g., risky sports), health (e.g., alcohol consumption and smoking), career (e.g., quitting a job without having a replacement), finance (e.g., risky investments), safety (e.g., high-speed driving) and social (e.g., standing for election). In addition, the definition of entrepreneurship used by Hisrich, Peters, and Shepherd (2005, p. 8) adds “financial, psychic, and social risks”. This study encompassing athletes and entrepreneurs applies a division into four domains: financial, social, health (as a combination of recreational and health risk), and career. (1) The financial risk comes with starting a new venture, which generally requires a considerable investment and brings income uncertainty (Sarasvathy, 2001). In addition, the top athlete needs to take financial risks, as the risk of injury or of losing sponsorship, for example, negative publicity (e.g., doping scandals in cycling) might diminish his or her income. (2) The social risk in both cases relates to the limited leisure time that might lead to social isolation from family and friends (Fernet et al., 2016). (3) Both have to face health risks. For the entrepreneur, a high physiological load and the psychological strain come with the constant need to be available and high levels of responsibility, which lead to a constant drain on resources (Dijkhuizen et al., 2016). The athlete has to accept the risk of injury, especially if involved in a high-risk sport. Psychological strain is rooted in the pressure to perform imposed by different stakeholders (by the athletes themselves, sponsors, or their fans). (4) The career risk for entrepreneurs depends on the culture they operate in: The acceptance of failure differs between countries, and a low acceptance level can have a negative impact on future

employers or investors (Walsh & Cunningham, 2016). While non-athletes invest time in education, athletes focus on their sports careers. When they need to adopt a second career, athletes are competing in the same job market as non-athletes, but often with lower education levels, less experience gained through opportunities like an internship, and are often older than other applicants (Zhang, Chin, & Reekie, 2018).

Byrnes, Miller, and Schafer (1999) pointed out that any study of risk behavior should consider gender differences. Women exposing themselves to risky situations like those inherent in high-risk sports are expected to differ from the prevailing gender role of risk-averse women. Demirhan (2005) found no significant difference in the risk perception between male and female mountaineers. Cazenave, Le Scanff, and Woodman (2007) compared women engaging in low-risk sports, female non-professional, and female professional athletes involved in sports involving risk-taking. The findings report professional athletes recorded higher scores for sensation seeking, and thrill and adventure-seeking. Using the context of the big five personality traits, Lochbaum et al. (2010) tested the moderating role of gender on the exercising personality and found no evidence for a moderation effect.

Comparing the characteristics of decision-making non-managerial and managerial (actual and prospective managers with a formal management education) men and women, Johnson and Powell (1994) found the managerial risk propensity to be similar across the genders but found women in the non-managerial group to demonstrate a more risk-averse style of decision-making. Studies of entrepreneurs have shown the same results (e.g., Masters & Meier, 1988). Croson and Gneezy (2009) stated that there is an exceptional relationship between gender and risk behavior when it comes to the subgroup of managers and entrepreneurs and suggest the differences in risk preferences compared to the general population might be a result of selection. Women choosing managerial positions or engaging in high-risk sports might have a similar risk propensity to men.

In summary, prior research indicates that the risk propensity of women and men in the fields of entrepreneurship and top athletes should be similar. This similarity and the other above-mentioned parallels lead to the following hypothesis:

H6: There is a difference in risk propensity between non-athletes, top athletes involved in a low-risk sport, and top athletes involved in a high-risk sport.

Prior research on individuals engaging in risky sports suggests that the differences between non-athletes and top athletes practicing high-risk sports might be stronger than those between non-athletes and top athletes practicing low-risk sports (e.g., Freixanet, 1991; Tok, 2011; Diehm & Armatas, 2004). Considering the same direction of personality traits for entrepreneurs and the higher values for top high-risk-sport athletes, this suggests an assumption that top high-risk-sport athletes are more suited to entrepreneurship than top low-risk-sport athletes.

2.3 Method

Data collection

We collected data via an online survey of 163 people, of whom 110 can be unequivocally classified as active top athletes pursuing individual sports (67) and non-athletes (43) aged 15 and older, who were still in the education process and had not embarked on a second career. To determine if an athlete could be designated top athlete, we refer to the German Olympic Sports Confederation's (2018) definition of squad membership, which provides the basis for (state-funded) sports promotion. Accordingly, we asked about (1) the frequency of training and participation in competitions with a focus on winning, (2) the participation in international high-level competitions, and (3) the affiliation to a squad. If (1) and either (2) or (3) were answered positively, the subject was classified as a top athlete. If all three questions were answered negatively, the participant was assigned to the group of non-athletes. A total of 53 participants were excluded for the following reasons: engagement in a team sport; multiple answers on the kind of sports that were not in the same risk class; answered (1) with yes and (2) and (3) with no, who are assumed to be hobby athletes. The people labeled non-athletes here may do sport in their leisure time as well, but they neither train to a high level and on a regular basis nor do they have a competitive motivation. The kinds of sport practiced by the athletes were clustered into two risk groups according to the classification of Zuckerman (1983), which involved distinguishing three groups based on the associated risks: high risk with the acute danger of incidents leading to serious injuries, medium-risk for sports where accidents might happen but cause only temporary disablement, and low-risk sports where injuries are unlikely. In line with Jack and Ronan (1998), the classification of Zuckerman was used to divide the top athletes into two groups: 31 top high-risk-sport athletes (practitioners of downhill skiing, motocross, mountain biking, Nordic combined, alpine skiing, ski cross, and ski jump) and 36 top low-risk-sport athletes (practitioners of biathlon, bodybuilding, judo, karate, gymnastics, competitive dancing, cycling, sailing, cross-country skiing, and sport shooting).

Given that there is no central register for top athletes that makes it possible to draw a representative sample, the researchers chose to approximate the overall population by utilizing as many channels for data collection as possible. The participants were directly contacted via officials and the trainers of their squads as well as the career advisers of the Olympic Training Centre. Social media channels offering special groups for athletes were used to post the link to the survey. The communication included a definition of the target group to facilitate the self-selection process. The group of non-athletes was also addressed via more general social media channels.

To prevent a language barrier hindering responses and to ensure that the group of German top athletes and non-athletes fully understood the questions, a German version of the

personality traits questionnaire was used. To reflect the time constraints affecting top athletes, a short version of the questionnaire was applied with satisfying reliability and factor validity.

Measures

The short version of the inventory was developed by Rammstedt and John (2005) based on the big-five inventory of Costa and McCrae (1992). The development process included comparing the reliabilities of the short version to the long version with 45 items; the results indicated that the Cronbach's alpha of the short version is less reliable by an average measure of 0.10. In addition, a test-retest measure was conducted to confirm the stability of the test; and proved almost equal to the long version, Rammstedt and John (2005) found their results reliable with a difference of $\Delta_{rtt} = .01$. The participants in the present study rated 21 items on a 5-point Likert scale to measure the variables neuroticism (4 items), extraversion (4 items), openness (5 items), conscientiousness (4 items), and agreeableness (4 items). The Cronbach's alpha readings show similar results to those of Rammstedt and John (2005), and all variables exceed the value of 0.6 ($\alpha_N = .788$, $\alpha_E = .751$, $\alpha_O = .653$, $\alpha_C = .667$, $\alpha_A = .620$), which is acceptable in line with other studies using similar alpha levels, for instance, Shepherd, Patzelt, and Baron (2013) or Martinez-del-Rio, Antolin-Lopez, and Cespedes-Lorente (2015) using values of 0.60 and 0.61.

The risk propensity scale (RPS) based on that of Meertens and Lion (2008, p. 1508) was applied to measure "everyday risk-taking behavior". The authors emphasize that the RPS does not reflect thrill-seeking or the risk of violating social norms within the questionnaire. Participants rated their risk-seeking tendencies on a 9-point Likert scale against nine items. With a Cronbach's alpha of $\alpha = .860$, the results show high reliability. Age and gender were used as descriptive variables.

2.4 Results

Sample characteristics

Responding to all questions asked was mandatory, so there were no missing values. A total of 163 participants completed the questionnaire, of whom 110 were unequivocally classifiable in the groups of non-athletes and top athletes participating in high-risk and low-risk sports. The gender distribution differs between the groups; because fewer women than men choose to engage in risky sports, the number of female participants in the high-risk-sport group is lower ($f=7$, $m=24$) than in the low-risk-sport group ($f=20$; $m=16$) and that covering non-athletes ($f=30$, $m=13$). The overall average age was 20.15 years (19.03 for top high-risk-sport athletes, 19.72 for top low-risk-sport athletes, and 21.30 for non-athletes).

Our results suggest that age did not correlate with any of our examined variables, but there is a correlation between gender and three personality traits (see Table 2-1). Men record lower scores in neuroticism than women ($r_N = -.369$, $p = .000$) and are therefore likely to be more emotionally stable, less agreeable ($r_A = -.271$, $p = .004$), and record higher risk propensity ($r_R = .446$, $p = .000$). To confirm that risk propensity should be viewed as an independent variable as assumed, Pearson's correlation coefficient (two-tailed) was calculated. Risk propensity was not correlated with the big five traits except for a significant negative correlation with neuroticism ($r_S = -.502$, $p = .000$). The absence of a correlation with the remaining four traits justifies using risk propensity as an additional variable. Table 2-1 shows the descriptive statistics and the correlations between the variables.

Table 2-1 Descriptive statistics and correlations

| Variable | Mean | SD | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. |
|----------------------------|--------|-------|---------|---------|-------|---------|-------|-------|-------|-------|-----|
| 1. Risk Group ¹ | 0.890 | 0.817 | -/- | | | | | | | | |
| 2. Gender ² | 0.480 | 0.502 | .376** | -/- | | | | | | | |
| 3. Age | 20.150 | 3.118 | -.304** | -.133 | -/- | | | | | | |
| 4. Neuroticism | 2.811 | 0.904 | -.326** | -.369** | .056 | -/- | | | | | |
| 5. Extraversion | 3.559 | 0.777 | .267** | -.133 | -.022 | -.257** | -/- | | | | |
| 6. Openness | 3.560 | 0.742 | -.113 | -.179 | .125 | .183 | .179 | -/- | | | |
| 7. Conscientiousness | 3.700 | 0.699 | .260** | 0.089 | .013 | -.157 | .198* | -.034 | -/- | | |
| 8. Agreeableness | 3.066 | 0.758 | .071 | -.271** | -.084 | -.213* | .200* | .011 | -.064 | -/- | |
| 9. Risk Propensity | 4.724 | 1.764 | .393** | .446** | -.161 | -.502** | .160 | -.098 | -.019 | -.006 | -/- |

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

¹ 0 = non-athlete; 1 = top low-risk-sport athlete; 2 = top high-risk-sport athlete

² 0 = f; 1 = m

Differences between the groups

To test the hypotheses, an ANOVA and a post-hoc test of variance were conducted. To transform mean and dispersion across individuals for one variable, we follow Fisher and Milfont (2010), who suggest z-standardizing the variables. In Table 2-2, the results of the ANOVA show the differences in personality traits between the groups of non-athletes, top athletes practicing a low-risk sport, and top athletes practicing a high-risk sport: Significant differences between the groups were observed for the variables neuroticism ($p_N = .002$), extraversion ($p_E = .007$), conscientiousness ($p_C = .023$), and risk propensity ($p_R = .000$). The variables openness and agreeableness were not found to differ significantly between the groups.

To obtain a more detailed view of the variables, a post-hoc ANOVA was conducted. Figure 2-1 shows the results graphically, and Table 2-3 provides the mean differences of the group comparisons.

Table 2-2 Results of the one-way ANOVA

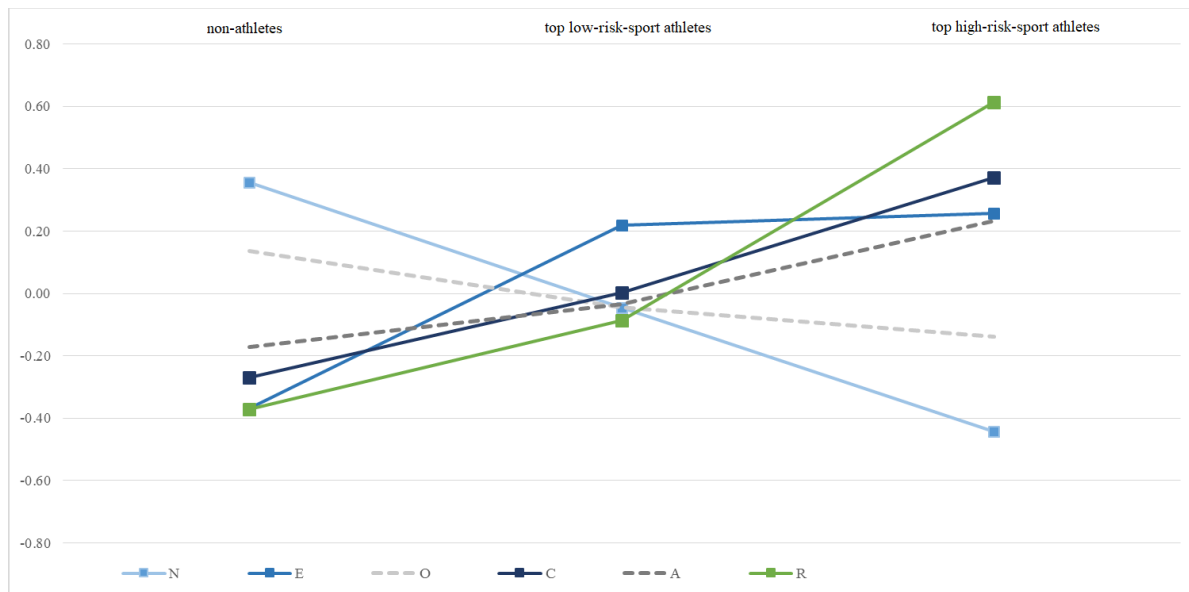
| Variable | | SS | df | MS | F | p |
|-------------------|----------------|-----------|-----------|-----------|----------|----------|
| Neuroticism | Between Groups | 11.602 | 2 | 5.801 | 6.373 | 0.002 |
| | Within Groups | 97.398 | 107 | 0.910 | | |
| | Total | 109.000 | 109 | | | |
| Extraversion | Between Groups | 9.586 | 2 | 4.793 | 5.159 | 0.007 |
| | Within Groups | 99.414 | 107 | 0.929 | | |
| | Total | 109.000 | 109 | | | |
| Openness | Between Groups | 1.442 | 2 | 0.721 | 0.717 | 0.490 |
| | Within Groups | 107.558 | 107 | 1.005 | | |
| | Total | 109.000 | 109 | | | |
| Conscientiousness | Between Groups | 7.406 | 2 | 3.703 | 3.900 | 0.023 |
| | Within Groups | 101.594 | 107 | 0.949 | | |
| | Total | 109.000 | 109 | | | |
| Agreeableness | Between Groups | 3.266 | 2 | 1.633 | 1.652 | 0.196 |
| | Within Groups | 105.734 | 107 | 0.988 | | |
| | Total | 109.000 | 109 | | | |
| Risk Propensity | Between Groups | 17.845 | 2 | 8.922 | 10.473 | 0.000 |
| | Within Groups | 91.155 | 107 | 0.852 | | |
| | Total | 109.000 | 109 | | | |

SS = sum of squares, df = degrees of freedom, MS = mean square

The level of neuroticism decreases from its high level among non-athletes through top athletes practicing a low-risk sport down to top athletes practicing a high-risk sport, thus indicating that individuals pursuing high-risk sports on a top-level are more emotionally stable than both top low-risk-sport athletes and even more so in relation to non-athletes. The post-hoc test showed a significant difference in neuroticism between non-athletes and high-risk-sport athletes. Considering extraversion, the ANOVA revealed significantly higher means for both top athlete groups compared to non-athletes (see Table 2-2). The graphic and the post-hoc test show a lower level of extraversion for non-athletes and only a slight difference for both top athlete groups. The post-hoc test confirmed only the difference between non-athletes and top high-risk-sport athletes was significant. The high significance of risk propensity reflected in the

ANOVA results can be emphasized by the graph that shows a steep slope for the means over the groups. Additionally, the post-hoc test confirms a significant mean difference for non-athletes compared to high-risk-sport athletes and a low risk compared to the same high-risk-sport athletes.

Figure 2-1 Means of personality traits of non-athletes, top low-risk-sport, and top high-risk-sport athletes



N = Neuroticism, E = Extraversion, O = Openness, C = Conscientiousness, A = Agreeableness, R = Risk Propensity

Table 2-3 Results of the post-hoc ANOVA between the groups

| Variable | Pair | | Mean Difference (I-J) | p |
|-------------------|------------------------|-------------------------|-----------------------|-------|
| Neuroticism | non-athlete | low-risk-sport athlete | 0.401 | 0.182 |
| | non-athlete | high-risk-sport athlete | 0.799** | 0.003 |
| | low-risk-sport athlete | high-risk-sport athlete | 0.398 | 0.240 |
| Extraversion | non-athlete | low-risk-sport athlete | -0.587* | 0.030 |
| | non-athlete | high-risk-sport athlete | -0.624* | 0.026 |
| | low-risk-sport athlete | high-risk-sport athlete | -0.037 | 0.988 |
| Openness | non-athlete | low-risk-sport athlete | 0.179 | 0.733 |
| | non-athlete | high-risk-sport athlete | 0.273 | 0.515 |
| | low-risk-sport athlete | high-risk-sport athlete | 0.094 | 0.929 |
| Conscientiousness | non-athlete | low-risk-sport athlete | -0.272 | 0.470 |
| | non-athlete | high-risk-sport athlete | -0.641* | 0.023 |
| | low-risk-sport athlete | high-risk-sport athlete | -0.370 | 0.306 |
| Agreeableness | non-athlete | low-risk-sport athlete | -0.405 | 0.201 |
| | non-athlete | high-risk-sport athlete | -0.138 | 0.842 |
| | low-risk-sport athlete | high-risk-sport athlete | 0.268 | 0.549 |
| Risk Propensity | non-athlete | low-risk-sport athlete | -0.285 | 0.397 |
| | non-athlete | high-risk-sport athlete | -0.984** | 0.000 |
| | low-risk-sport athlete | high-risk-sport athlete | -0.700** | 0.010 |

*. The mean difference is significant at the 0.05 level.

** . The mean difference is significant at the 0.01 level.

2.5 Discussion

Person–job fit theory and the fact that careers of a top athlete and an entrepreneur have very similar requirements led us to assume that the top athlete and entrepreneur groups would display similar personality traits. The study considered if there is a significant difference between the groups of non-athletes, top low-risk-sport athletes, and top high-risk-sport athletes and if the characteristic of the variables is similar to the direction of personality traits found for individuals with high levels of entrepreneurial intent and success.

Entrepreneurs and athletes – traits in the same direction

The results of the ANOVA – showing a significant difference between the groups in terms of neuroticism, extraversion, conscientiousness, and risk propensity – are in line with our assumptions and thus support H1, H2, H4, and H6. Unexpectedly, openness and agreeableness failed to register significance, and H3 and H5 must therefore be rejected. As stated above, the characteristics of agreeableness might be ambiguous as the athlete is an individual sportsperson aiming for a personal-best performance, which one might expect to adversely affect agreeableness, but might also feel a strong affiliation with a training squad or identify with the sport, which might lead to a higher level of agreeableness. These opposite effects might explain the non-significance of the difference in agreeableness. Openness is the variable that is most difficult to measure and predict among the big five (Schwaba et al., 2018). The last referenced research examined openness over the subjects' lifespan and found openness reached a high and constant level during young adulthood. The level of openness is also positively related to successful applications to college, showing higher means for college students compared to individuals not attending a college or university (Lüdtke et al., 2011). In the group of non-athletes, the mean age was 21.30 years, and 36 of the 43 participants were students, factors that might increase the mean value of the non-athlete group and narrow the gap with the athletes.

We were interested in scrutinizing the relationships, so used ANOVA to conduct single comparisons between the groups. Table 2-4 shows significant differences between non-athletes and top athletes, independent of the kind of sport, in neuroticism ($p_N = .002$), extraversion ($p_E = .002$), conscientiousness ($p_C = .023$), and risk propensity ($p_R = .002$). The results, therefore, support indications in the existing literature that there is a difference between athletes and non-athletes (Steca et al., 2018). Comparing non-athletes with top athletes conducting a low-risk sport, all variables failed to register significance with the exception of extraversion ($p_N = .086$, $p_E = .010$, $p_O = .427$, $p_C = .231$, $p_A = .080$, $p_R = .174$). This might indicate that being a top athlete is not enough to establish that a person is a strong candidate to pursue entrepreneurship and that other influential factors are at play. Our study focused on the risk class of sports. Comparing non-athletes and top athletes participating in high-risk sports, the results were in line with the graphical analysis, showing highly significant differences between the groups for neuroticism ($p_N = .000$), extraversion ($p_E = .010$), conscientiousness ($p_C = .002$), and risk propensity ($p_R = .000$).

Table 2-4 Results of single comparisons of the one-way ANOVA

| | | Top athlete vs non-athlete | | | | | Top low-risk-sport vs non-athlete | | | | | Top high-risk vs non-athlete | | | | |
|-------------------|---------------|----------------------------|-----|-------|-------|-------|-----------------------------------|----|-------|-------|-------|------------------------------|----|-------|-------|-------|
| | | SS | df | MS | F | p | SS | df | MS | F | p | SS | df | MS | F | p |
| Neuroticism | Between | 8.970 | 1 | 8.970 | 9.684 | 0.002 | 3.155 | 1 | 3.155 | 3.018 | 0.086 | 11.49 | 1 | 11.49 | 13.85 | 0.000 |
| | Within Groups | 100.03 | 108 | 0.926 | | | 80.50 | 77 | 1.045 | | | 59.74 | 72 | 0.830 | | |
| | Total | 109.00 | 109 | | | | 83.65 | 78 | | | | 71.23 | 73 | | | |
| Extraversion | Between | 9.563 | 1 | 9.563 | 10.38 | 0.002 | 6.753 | 1 | 6.753 | 6.927 | 0.010 | 7.020 | 1 | 7.020 | 7.022 | 0.010 |
| | Within Groups | 99.437 | 108 | 0.921 | | | 75.06 | 77 | 0.975 | | | 71.97 | 72 | 1.000 | | |
| | Total | 109.00 | 109 | | | | 81.81 | 78 | | | | 78.99 | 73 | | | |
| Openness | Between | 1.295 | 1 | 1.295 | 1.298 | 0.257 | 0.627 | 1 | 0.627 | 0.636 | 0.427 | 1.341 | 1 | 1.341 | 1.445 | 0.233 |
| | Within Groups | 107.70 | 108 | 0.997 | | | 75.83 | 77 | 0.985 | | | 66.83 | 72 | 0.928 | | |
| | Total | 109.00 | 109 | | | | 76.46 | 78 | | | | 68.17 | 73 | | | |
| Conscientiousness | Between | 5.130 | 1 | 5.130 | 5.334 | 0.023 | 1.445 | 1 | 1.445 | 1.460 | 0.231 | 7.406 | 1 | 7.406 | 10.25 | 0.002 |
| | Within Groups | 103.87 | 108 | 0.962 | | | 76.22 | 77 | 0.990 | | | 51.97 | 72 | 0.722 | | |
| | Total | 109.00 | 109 | | | | 77.67 | 78 | | | | 59.38 | 73 | | | |
| Agreeableness | Between | 2.074 | 1 | 2.074 | 2.094 | 0.151 | 3.217 | 1 | 3.217 | 3.138 | 0.080 | 0.341 | 1 | 0.341 | 0.327 | 0.569 |
| | Within Groups | 106.92 | 108 | 0.990 | | | 78.93 | 77 | 1.025 | | | 75.15 | 72 | 1.044 | | |
| | Total | 109.00 | 109 | | | | 82.15 | 78 | | | | 75.49 | 73 | | | |
| Risk Propensity | Between | 9.695 | 1 | 9.695 | 10.54 | 0.002 | 1.589 | 1 | 1.589 | 1.886 | 0.174 | 17.45 | 1 | 17.45 | 22.15 | 0.000 |
| | Within Groups | 99.305 | 108 | 0.919 | | | 64.85 | 77 | 0.842 | | | 56.71 | 72 | 0.788 | | |
| | Total | 109.00 | 109 | | | | 66.44 | 78 | | | | 74.17 | 73 | | | |

SS = sum of squares, df = degrees of freedom, MS = mean square

The ANOVA, showing the sum of squares, allows us to make a statement concerning the difference between the groups but no further interpretation of the direction of the differences. Therefore, graphic analysis and post-hoc tests were conducted, which made it possible to establish the similarities of athletes and entrepreneurs and highlight the difference between athletes participating in low-risk sports and those favoring high-risk sports. The mean differences in the post-hoc test for neuroticism and conscientiousness were significant (positive in the case of neuroticism and negative in the case of conscientiousness) for non-athletes compared to high-risk-sport athletes. The direct comparison between non-athletes and low-risk-sport athletes failed to register significance, as did the comparison between low-risk-sport athletes and their high-risk-sport counterparts. But the graphical analysis shows a reduction in the means relating to neuroticism and an increase in those for conscientiousness running from the non-athlete to the low-risk-sport athlete to the high-risk-sport athlete. Although the post-hoc test results showed non-significance for the comparison between low-risk- and high-risk-sport athletes in terms of the big five, the graph (see Figure 2-1) gives a first indication that athletes practicing high-risk sports might be more emotionally stable and more conscientious than those involved in low-risk sports.

For both groups of top athletes, being emotionally stable is a useful trait as it would help them remain calm during competition or to handle failure. Top athletes also need a high level of conscientiousness to achieve peak training conditions and be successful. Nevertheless, it is important to note that the consequences of failing to maintain high levels of conscientiousness can be far more serious in high-risk sports than in low-risk ones. For example, missing a target in a biathlon shooting event does not physically harm anyone, but a crash at over 100km/h in mountain skiing most likely will. Accordingly, the need for emotional stability and conscientiousness is more imperative for top athletes pursuing high-risk sports than it is for their counterparts pursuing low-risk sports. It could therefore be the case that a top high-risk-sport athlete might make the more suitable entrepreneur.

In the case of extraversion, the comparison between non-athletes and low-risk-sport athletes as well as high-risk-sports athletes was significant, but the comparison between both groups of athletes failed to register significance. Top athletes need to maintain high levels of assertiveness, activeness, and energy if they are to trust their competence, stay motivated, and achieve personal-best performances. The same argumentation can be used for entrepreneurs. Entrepreneurs believing in their own ideas and performance have higher chances of prevailing in the market (Baluku, Kikooma, & Kibanja, 2016). In addition, the self-motivation aspect is important for entrepreneurs because they face an ongoing battle against high workloads and the risk of failure. The higher values recorded in extraversion for high-risk-sport athletes (see Figure 2-1) might be supported by the enhanced search for excitement and stimulation that is also a characteristic of the extraversion variable.

The result of risk propensity being significantly different for all comparisons with athletes practicing high-risk sport is of consequence because the choice of whether to pursue a more or a less risky sport and the risk propensity variable is expected to be causally interrelated. Figure 2-1 shows the incremental development rising from the non-athlete through the low-risk-sport athlete to a high mean value of 5.8 for a high-risk-sport athlete on a 9-point Likert scale. A high-risk propensity, thus, the willingness to take risks, is a key attribute for entrepreneurship (Zhao, Seibert, & Lumpkin, 2010). So, it can be said that athletes are more suited to entrepreneurship than non-athletes because of their greater risk propensity, which is particularly marked among athletes involved in high-risk sports.

To summarise, it can be said that considering the direction of the variable for athletes (see Figure 2-1), the personality characteristics match the detected direction for entrepreneurial intention and success. With reference to the meta-analysis on entrepreneurial intention and success produced by Zhao, Seibert, and Lumpkin (2010) and our result, the entrepreneur and the athlete are less neurotic, more extroverted, more conscientious, and exhibit a higher level of risk propensity than the other reference groups.

Finally, the findings of this study do not support the logic that “the more the better” (or “the less the better” for neuroticism) is applicable for all personality traits of entrepreneurs. A higher level of emotional stability and conscientiousness will not do any harm; however, in the case of extraversion and risk propensity, in particular, an overly high level might lead to impetuous decisions involving too high a risk that stems from a desire to seek out excitement.

Implications

Our findings contribute to both the existing research and to practice. Existing studies with quantitative data examine sports students or individuals engaging in sport, regardless of whether the context is recreational or professional. This study fills the existing research gap by supplying data from high-level competition athletes engaging in either low-risk or high-risk sports and linking the results to entrepreneurship. The explanatory study following the ANOVA makes it possible to draw further conclusions on the eligibility of athletes. The graphical analysis offers reasonable evidence of differentiation between the risk level of their sports, which should encourage further research on that topic. This research could provide a decisive cornerstone for future research as it presents athletes as a group of individuals choosing a career as a professional athlete based on the same motives and similar characteristic personality traits. Based on the person-job fit theory and the associated attraction to entrepreneurship, entrepreneurship could offer a suitable second career choice not only for athletes but also for individuals in other professions, which are typically limited in time, such as fashion models, artists, or military personnel.

Athletes were found to be similar to entrepreneurs in their personality traits, and person-job fit theory suggests there is a greater probability they would be inclined to engage in entrepreneurial activity as a second career choice. Successful athletes develop special skills within a certain setting, but as the professional education of athletes often suffers from their focus on their sports career, their lack of business knowledge might hamper their becoming an entrepreneur. In line with Ratten and Jones (2018), our results emphasize the relevance of entrepreneurship education to build upon the ability and the knowledge top athletes possess and direct them towards entrepreneurship. The knowledge acquired here offers a fundamental basis upon which to formulate education programs specifically for athletes.

The similarity in personality between athletes and entrepreneurs also indicates the occupational aptitude of top athletes for specific jobs. This aptitude might be considered by future employers for jobs requiring innovative behavior as well as investors considering an investment decision in a top athlete as an entrepreneur.

Limitations and future directions for research

Several interesting limitations of this study pave the way for further research on the interface of sports and entrepreneurship. Men and women were included in the study, although it is important to be aware that risk behavior differs between the sexes (Byrnes, Miller, & Schafer, 1999). Although the difference for women engaging in a high-risk sport and female entrepreneurs was explained above, the gender difference merits further research attention. The limited access to top or elite athletes led to a total sample size of 67 top athletes. The resulting small group sizes might limit the generalizability, which future research might address.

It can be said that top athletes are temperamentally suited to becoming entrepreneurs. What effect the kind of sport plays in that process opens a potential avenue for future research. Here the risk class of the sport was included in the examination and interpretation, and those factors clearly affected risk propensity, but agreeableness not having a significant influence might be investigated in the context of individual versus team sports, where the ambiguous effects are clearer. Hence, understanding the particularities of team sport athletes and their fit to entrepreneurship might be an interesting future research question.

Another interesting avenue for future research is the question of what kind of entrepreneurship top athletes might engage in. Ratten (2019) highlights the social impact of sport, for instance, by mitigating differences in physical or mental states. Accordingly, athletes might be more aware of social inequality and social states of emergency. Massive (social) problems can be valuable sources for discovering entrepreneurial opportunities (Kuckertz, Berger, & Gaudig, 2019). Therefore, top athletes might engage especially in entrepreneurial activity, which creates not only economic but also social impact.

2.6 Conclusion

The personality traits of athletes practicing high-risk sports and those practicing low-risk sports were examined and compared to the picture of entrepreneurs' personalities derived from prior research. The athletes' personality traits match the detected directions for entrepreneurial intention and success. The entrepreneur and the athlete are less neurotic, more extroverted, more conscientious, and record a higher risk propensity than members of the reference groups. In light of the person-job fit theory, the similar job demands associated with the careers of athletes and entrepreneurs lead to the conclusion that athletes are more likely to pursue a career in entrepreneurship and do so successfully as a second career choice. The analogous nature of athletes' and entrepreneurs' personality traits also indicates the suitability of athletes for entrepreneurship and, therefore, the necessity of entrepreneurship education programs tailor-made for professional athletes. Entrepreneurship education programs might foster awareness of entrepreneurship as a second career choice and also provide specific business knowledge to enable the athletes to succeed with a business idea.

3 Athlete entrepreneurs: the career transition of professional athletes taking the entrepreneurial track

Author

Kathrin Steinbrink

Abstract

Purpose – Being a professional athlete shapes individuals in a particular way. The purpose of this study is to understand the transition conditions as learnings, expectations, and external factors affecting professional athletes entering an entrepreneurial career.

Design/methodology/approach – The study uses comparative causal mapping to investigate the career transition of eleven athlete entrepreneurs (i.e., former or active professional athletes who pursue an entrepreneurial career as a second career choice). Information on the drivers of and barriers to the career transition was gathered through semi-structured interviews.

Findings – Skills and traits were identified as important drivers of an entrepreneurial career for athletes. Furthermore, athletes' developing various coping strategies and opting to remain in a familiar environment show that selection and socialization influence the career transition process.

Research limitations/implications – The research on the specific group of athlete entrepreneurs provides a cornerstone for future research on drivers of and barriers to athletes' transition into entrepreneurship. Retaining the person-environment fit, socialization, and selection processes are identified as influencing athlete entrepreneurs. Furthermore, the development of coping strategies is found to be a great advantage for the career transition into entrepreneurship.

Practical implications – The findings identify specific support needs of athletes arising from the limitations of their first career. However, the advantages identified reveal the opportunity to develop relevant skills and traits in different settings with entrepreneurial education measures.

Originality/value – The use of a comparative causal mapping approach creates interview data that allow a systematic comprehension of common drivers observed among athletes choosing to become entrepreneurs. Findings underline the particularities of athletes as entrepreneurs and reveal opportunities to imitate advantageous learning in education programs.

Keywords

Athlete entrepreneurship, sport entrepreneurship, career transition, coping, comparative causal mapping

Article information

This section is based on the manuscript, currently under review at a C-ranked journal according to VHB JOURQUAL 3. The author is indebted to Univ.-Prof. Dr. Andreas Kuckertz for enriching discussions and his assistance during the conceptualization and editing of this study.

3.1 Introduction

Social scientists began to research career transitions in the field of sports in the 1970s (e.g., Mihovilovic, 1968, Haerle, 1975). In the 1990s, the predominant perspective on that career transition process developed from the perspective of two points of transition (into and out of sport) to being a lifespan process (Wyllemann, Alfermann, & Lavallee, 2004). Research showing parallels between professional athletes and entrepreneurs (Steinbrink, Berger, & Kuckertz, 2020) suggests that former professional athletes have skills and traits that are advantageous if they choose to become entrepreneurs. However, the relationships do not appear to be that simple, as the adaption of a new career is also influenced by factors such as the extent to which leaving the first career is voluntary (Webb et al., 1998) or the preparations for that new career (Kenny, 2015).

This research aims to challenge the findings on career transition within the frame of second career entrepreneurs with a former career as professional athletes. A professional athlete is here defined as a person who (1) themselves considers their sport a career and whose work time and income earned is mainly in a sports setting (2) who actively has trained for and participated in national or international competitions.

The central questions of this study are 1) what drivers of and barriers to the career transition of professional athletes into an entrepreneurial career can be identified and 2) what are the effects of such a career transition. Answering our research questions will identify which commonalities, relevant learnings, and prerequisites relating to being a professional athlete can be transferred to the career choice of entrepreneurship.

The theoretical framework of social cognitive theory (SCT) of Bandura (1986) indicates that past experiences influence a career transition. In this study, the career transition process of people whose first career was as a professional athlete is examined to find out more about influencing factors and motives that are developed within the first career or that exist independently. To empirically validate the theoretical assumptions, comparative causal mapping after Laukkanen and Wang (2015) is applied to identify and visualize shared causes and effects around the anchor topic of career transition. Causal relations between the coded concepts and the actual point of career transition were examined to better understand the drivers and barriers affecting the specific group of sports entrepreneurs.

This explorative study provides relevant insights into the literature on career transition by researching the causal relations affecting and following the career transition process of professional athletes entering an entrepreneurial career. Addressing the research gap around the details of the career paths of former athletes commencing a second career as entrepreneurs (Pellegrini et al., 2020), the findings around athlete entrepreneurs' transition conditions, skills, and traits alongside outcome expectations contribute to the entrepreneurship

literature. The applied method of comparative causal mapping deepens recent findings about drivers towards entrepreneurship, e.g., by Stirzaker et al. (2021) analyzing social entrepreneurs. Changing the viewpoint on the advantages conferred by being an athlete, the results can have implications for non-athletes too. The specific situation of athlete entrepreneurs enables a combined consideration of the contextual and the individual approach on coping to better develop coping strategies (Pathak & Goltz, 2020). Knowledge about supporting starting conditions for the career transition into entrepreneurship, such as coping strategies, contributes to the discussion of entrepreneurship education.

3.2 Theoretical background

According to SCT, learning is embedded in a social context and behavioral action, and the reasons for this action are rooted in past experience (Bandura, 1986). The basis of SCT is three variables: self-efficacy (confidence in performance capability), outcome expectations (consequences of behavioral efforts), and goals (determination to act). The social cognitive career theory by Lent, Brown, and Hackett (2002) is a development of SCT, which can be applied to specific contexts such as career transition, which adds that people develop adaptive career behaviors through educational and work experience over the course of their careers (Lent & Brown, 2013).

Numerous studies research entrepreneurial intention as a predictor of the actual entrepreneurial behavior (e.g., Autio et al., 2001; Engle et al., 2010; Liguori, Bendickson, & McDowell, 2018). A popular approach to explain an entrepreneurial career path via intention is the social-cognitive model of career self-management (CSM) (Lent & Brown, 2013). Perez-Lopez, González-López, and Rodríguez-Ariza (2019) addressed a research gap by empirically testing the social cognitive model of CSM in the context of entrepreneurship among a group of university students. The authors surveyed 376 final-year students and found adaptive behavior based on exploratory activities and coping behavior moderated their decisiveness with regard to an entrepreneurial career (Perez-Lopez, González-López, & Rodríguez-Ariza, 2019).

Self-efficacy

Perez-Lopez, González-López, and Rodríguez-Ariza, (2019) apply the CSM model to entrepreneurial career decisions and do not expressly consider personality traits as suggested in the CSM model of Lent and Brown (2013). The variable *self-efficacy* represents the perceived confidence concerning the ability to assess available career options and the personal fit concerning those options, as well as the decision on which option to take (Pérez-López, González-López, & Rodríguez-Ariza, 2019). Within this study, the participants were asked to speak about specific knowledge or experience (1) gained in the first career of being

a professional athlete and (2) that which existed independently without any connection to the first career, which retrospectively had a positive or negative impact on their careers as entrepreneurs.

Coping behaviors

The CSM model of Lent and Brown (2013) was extended by Pérez-López, González-López, and Rodríguez-Ariza (2019) through the addition of the variable *coping behaviors*, which is presented as a relevant aspect explaining the decisiveness relating to adopting an entrepreneurial career. Pérez-López, González-López, and Rodríguez-Ariza (2019) defined the adaptive behaviors they anticipated would be involved in the career transition of university students. For the sample of professional athletes, the focus of adaptive behavior in this study will be on coping behavior.

The relation between self-efficacy and adaptive coping behaviors has been researched in many contexts (e.g., Haney & Long, 1995; Merluzzi et al., 2001). Pérez-López, González-López, and Rodríguez-Ariza (2019) confirmed the direct effect of self-efficacy on coping behavior, whereas Welsh et al. (2021) identified a direct effect from refugees' self-efficacy on their entrepreneurial intention. Bullough, Renko, and Myatt (2014) found resilience directly influenced the entrepreneurial intention of danger zone entrepreneurs (i.e., entrepreneurship taking place in dangerous environments such as war or terror) but also identified interaction with self-efficacy. The common ground of the argumentation is a high level of self-efficacy, so a person's belief that they handle obstacles well is related to the coping strategies adopted. In summary, athletes with a strong belief in their ability to cope with adversity might handle obstacles better than people who do not have strong self-belief. Positive experiences of coping, such as the ability to overcome a failure in sport, might also lead to a stronger sense of self-efficacy. Athletes face many forms of obstacles and stressors, including competitive (e.g., fear of loss or actual loss), organizational (e.g., within the team or with sponsors), and personal (e.g., losing social contacts, negative press releases) (Fletcher & Sarkar, 2012). Athletes are also not exempt from general adversity such as crises (Ratten, 2020). Coping with failure might be challenging but a necessary quality for athletes facing failure combined with criticism, pressure, and expectations from the environment (Ceccarelli et al., 2019). Coping is understood here as making short-term adjustments in reaction to adverse events, whereas resilience is a concept located between coping and development, so a long-term, stable pattern (Leipold & Greve, 2009) which can be developed (Luthans, Vogelgesang, & Lester, 2006).

Outcome expectations

Outcome expectations are based on the anticipated consequences of an action or behavior (Lent, Brown, & Hackett, 2002) containing social, material, and self-evaluative outcomes (Lent et al., 2016) and are found to affect goals, actions (Lent & Brown, 2013), and entrepreneurial

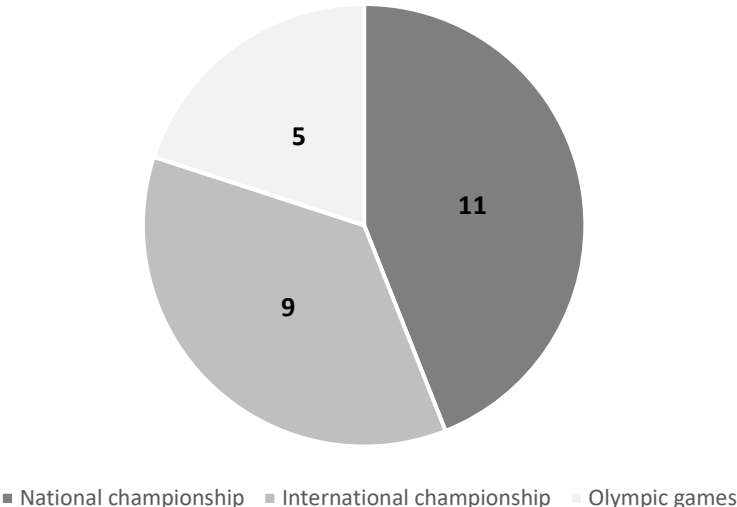
intention (Pérez-López, González-López, & Rodríguez-Ariza, 2019). Kerr (2017) researched the motivation of later life entrepreneurs (i.e., those aged over 50) to become an entrepreneur for their, divided into push factors (higher income) and pull factors (personal fulfillment, independence, and work-life balance). To identify motivational drivers of entrepreneurship, the current study next addresses the expected outcomes of pursuing an entrepreneurial career.

3.3 Method

Sample

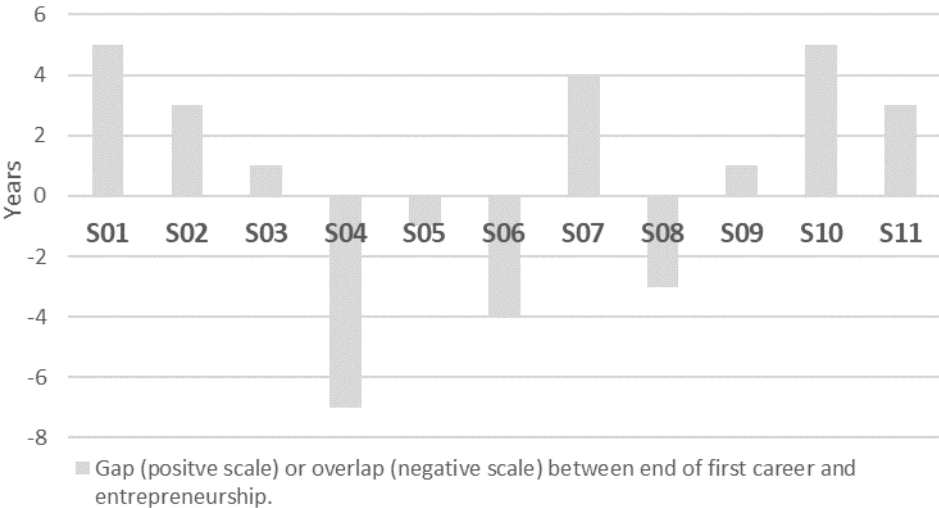
In the present study, an athlete entrepreneur is defined as a former or active professional athlete who pursues an entrepreneurial career as a second career choice. Therefore, its subjects are the specific group of former and active professional athletes that choose the entrepreneurial path as a second career choice. The homogenous group of athletes was chosen because athletes have a particular starting position, acquiring specific experience within the sport (Ratten, 2020a). The skills, traits, motivations, and contextual circumstances impelling a person to start a business differ from those of people that develop professionally within the market economy (e.g., Li & Sum, 2017; Ratten, 2015). Another factor uniting athletes is the need for reorientation while they are still relatively young, given that a professional sportsperson’s career is limited by age (owing to declining performance) and sometimes also by health.

Figure 3-1 Maximum competitive level attained of the athletes



The sample comprises eleven German professional athletes, nine male, and two female, aged between 23 and 58 (43.1 years on average). The athletes had competed at a high level in badminton, bobsledding, cycling, hockey, rowing, soccer, swimming, and track and field. The requirements for being selected as a professional athlete were (1) a predominant focus on the career as a sports professional and (2) the participation in national championships or higher-level competitions (five athletes had participated in the Olympic games; see Figure 3-1 for more detail). At the time the interviews were conducted, all eleven had ventured into business at some level. Nine participants are still active as entrepreneurs, but six had abandoned their first entrepreneurial business. Figure 3-2 contains information for each participant on when the first (sports) career ended and the year of founding a venture. One athlete is still a professional athlete but has already commenced an entrepreneurial career. An important selection criterion for the interviewees was that they had not had a permanent transitional job between the two careers that could have led to changes in the personal, circumstantial, and motivational aspects of interest. Being a trainer in the original sport was expected to not change the aforementioned aspects of interest.

Figure 3-2 Gap or overlap of the career transition in years



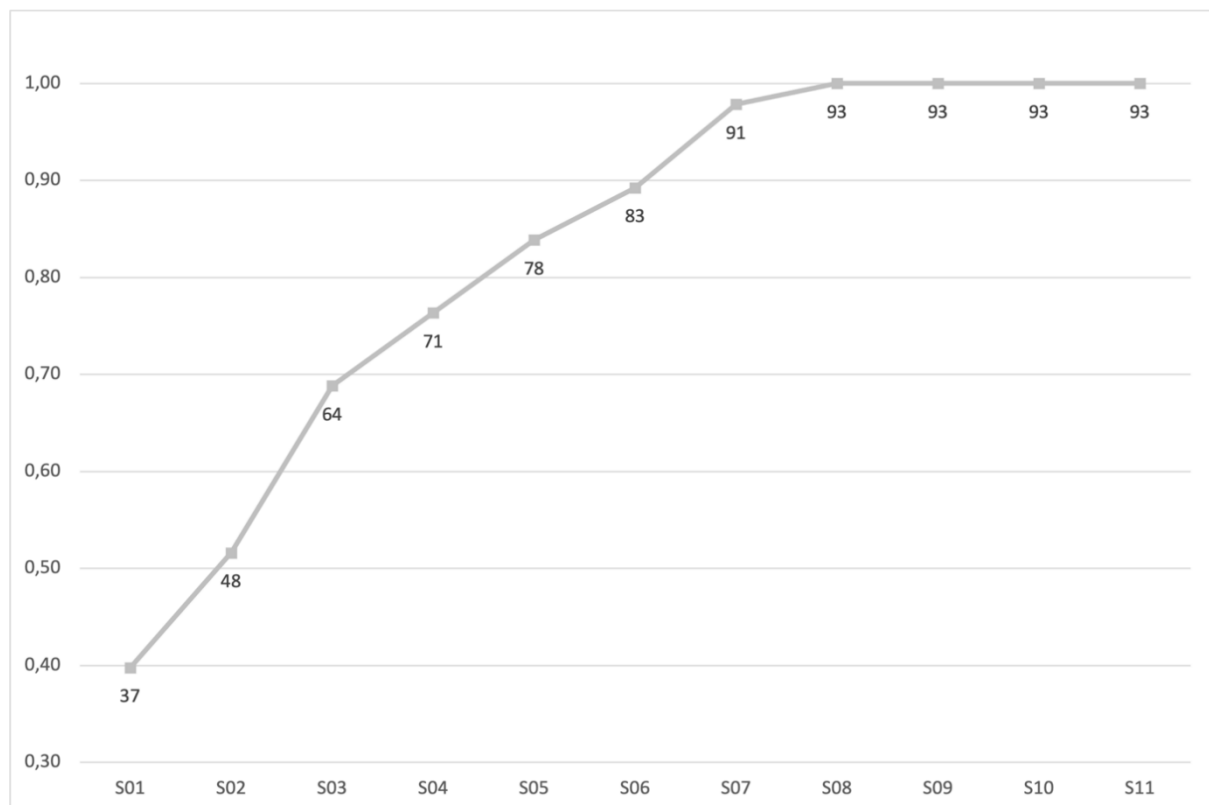
Analytical approach

Replication is used as the underlying logic of building theory from case studies to develop the theory around the career transition inductively (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). Therefore, every case is considered to be a single experiment, and replication of causal

relationships is examined. Therefore, comparative causal mapping is a suitable method for analyzing the career transition of professional athletes into entrepreneurship. Each participant's individual causal beliefs were harvested and afterward aggregated to identify shared belief patterns. Structured approaches to data generation were used to validate fixed concepts to frame a common meaning reflecting the input of all participants (Laukkanen, 2017). This study uses semi-structured interviews to identify causal statements around an anchor topic. The causal beliefs around that anchor topic can reveal commonalities of groups with similar experiences, knowledge, and beliefs (Schulte-Holthaus & Kuckertz, 2020). Oral forms of data have to be transcribed to be coded and analyzed by content.

To preserve anonymity, all participants were assigned the letter "S" and a two-digit number after the interview. To validate data and determine the necessary number of respondents for theoretical saturation (Glaser & Strauss, 1967), the saturation of the standard node terms (SNT) was calculated. The number of cumulative standardized concepts was 93. Figure 3-3 demonstrates that the full theoretical saturation was achieved with respondent eight, but even after six respondent interviews, 83 concepts (89%) of the standardized concepts had been elicited. The early achievement of a high concordance and the stable occurrence for the last four interviews indicate that the concepts are suitably represented.

Figure 3-3 Theoretical saturation of the standard node terms (SNT)



Interview structure

Participants were first contacted via an email briefly introducing the anchor topic of a career transition from athlete to entrepreneur. The same email also assured the recipients of anonymity and that their responses would remain confidential.

The interviews were conducted between May 2020 and February 2021 in the middle of the Covid19 crisis. Therefore, all interviews had to be conducted via telephone or the Zoom videoconferencing app according to the respondent's preference. The interviews were conducted in German and varied in length between 23 minutes and 118 minutes, with an average duration of 43 minutes. The interviews were audio-recorded, transcribed, and anonymized.

The participants were asked to speak of their personal experience of the anchor topic of career transition, thinking of past experiences, and to recall the drivers and barriers that influenced their decisions. Following Rowley (2012), six questions, each with two to four sub-questions, were prepared in a set order. However, the interview format did allow for some flexibility in the order in which the questions were addressed to respect the answers of the interviewees and not to interrupt the flow of the dialogue. Sub-questions were only asked if the main question was not understood correctly.

Coding and standardization

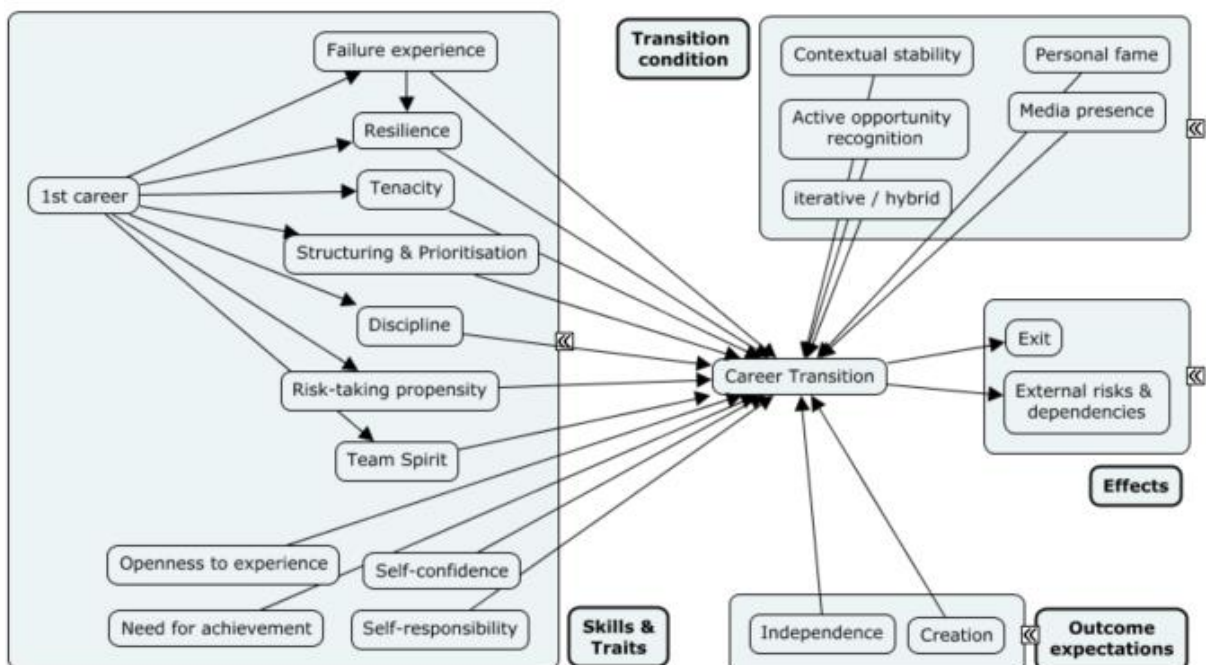
In comparative causal mapping (CCM) studies, three levels of coding are distinguished. Level 0 contains the raw data elicited from interviewees: natural language units (NLUs), the natural voice of the respondent, representing a concept, natural causal units (NCUs) represent the relationships between the NLUs. Level 1 summarises NLUs into concepts, so-called standard terms (STERM). Laukkannen and Wang (2015) state that this level is the typical level of coding in low-structured and semi-structured interviews. Common terms are used to merge synonyms and differentiate between homonyms to derive homogenous concept categories. To achieve this level of coding, a twofold process was chosen. Rich data texts can be handled by generic qualitative data analysis software such as MAXQDA. However, such programs are not well suited to the analysis and presentation of causal relationships and must often be supported with the use of CCM (Laukkanen & Eriksson, 2013). The MAXQDA software was used by the author and a research assistant independently to identify relevant text passages and search for shared concepts. First, three interviews were coded, compared, and discussed to achieve a common understanding and to set coding rules. Subsequently, all interviews were coded independently, and the results were compared. Identifying critical codes with low data consistency, these segments and concepts were discussed. On the premise of not interpreting statements and staying close to the original words and the context, synonyms were merged, and homonyms differentiated. As a second step, the participants' statements were transferred

onto the software CMAP as NLUs, representing the natural utterance of a concept. Each NLU was categorized to a STERM based on the agreement within the coding process via MAXQDA to achieve a catalog of codes used for the identification of causal relations between the NLUs. The NCUs show the causal relations between two NLUs with a positive or negative effect (A → (+/-) B).

3.4 Results

Figure 3-4 shows the aggregated causal map of the career transition process of professional athletes transitioning to an entrepreneurial career. The coded segments had to occur for five of the eleven participants, presenting the shared concepts and directions of effects of (A → B). To identify shared concepts while avoiding overgeneralization (Tremml, 2020), a cut-off of around 50% is recommended (Carley, 1997) and used in similar studies with the same number of eleven participants (Schulte-Holthaus & Kuckertz, 2020). All shared causal relations had a positive sign.

Figure 3-4 Cause map around the anchor topic of career transition of athlete entrepreneurs



Based on the modified CSM models of Lent and Brown (2013) and Pérez-López, González-López, and Rodríguez-Ariza (2019), the results are summarized in three groups: (1) skills and

traits, (2) outcome expectations, and (3) contextual factors. A total of 93 codes were generated. Furthermore, 47 skills and traits, 14 outcome expectations, and 30 contextual factors were coded into the 91 concepts (without a first career and career transition). The eleven interviewees mentioned information that appeared under 385 different codes, divided into 193 skills and traits (50.13%), 50 outcome expectations (12.99%), and 142 contextual factors (36.88%).

Table 3-1 Concepts mentioned by category

| | n | n/S | n/S (in%) |
|----------------------|-----------|------------|------------------|
| Skills & traits | 47 | 193 | 50.13% |
| Outcome expectations | 14 | 50 | 12.99% |
| Contextual factors | 30 | 142 | 36.88% |
| Totals | 91 | 385 | 100.00% |

Skills and traits

According to McCrae and Costa (1997, p. 825), personality traits are usually individual differences that are “often first recognized by noting groups of individuals who are conspicuously different.” In this study, the aspects of experience and learning derived from the first career are expected to influence the second career as an entrepreneur. The differentiation between skills and traits is controversial in prior literature; for example, discussing the possibility of training *resilience*, Leys et al. (2020) describe traits as stable and unchangeable during a lifetime but conclude that currently, *resilience* cannot be clearly classified as either a trait or a skill. Accordingly, based on SCT, adding the social-cognitive component and the possibility of change of traits, skills and traits are here subsumed into one group of changeable characteristics.

Seven skills and traits were linked to the first career as a professional athlete. Four respondents linked their first career experience to their *openness to experience*, three to *self-confidence*, and two respondents mentioned their *self-responsibility* and *need for achievement*. So these four are considered unattached skills and traits. S09 reported being sporty, ambitious, and aiming for success, “I was that way since early childhood. I don’t think I have changed with the sport”; while S07 said, “I am what I am, have always been that way.” Examples of strong evidence in the linkage between first career and the construct are *resilience*, *discipline*, or *failure management*, with each of the seven participants reporting the causal relationship.

Experiencing failure is common for professional athletes. Unsurprisingly all eleven interviewees mentioned *failure experience* in their first career having a positive causal relation to the career transition, for example, “even in a perfect match I make mistakes, for sure” (S06) or “I didn’t win every race” (S01).

The only causal relation between the drivers of entrepreneurship is found with *failure experience* and *resilience*. *Resilience* is a widely used term, and many definitions and perspectives exist, even in the specified context of sport (Galli & Gonzalez, 2015). Fredrickson (2001) compares resilient individuals to “resilient metals [that] bend but do not break” because of their ability to “bounce back from stressful experiences quickly and efficiently” (p.222). In the context of sport, *resilience* is understood here as successfully using the adaptive capacity to address adversity in the sports context. Adversity can arise in different contexts, such as injury, the athletes’ performance, health issues such as illness, and in the course of a career transition (Galli & Vealey, 2008). “Every successful athlete has been defeated various times and stood up again, didn’t give up, continued to train. And that’s what makes us strong” (S07); “It’s not bad to fall down, just don’t stay down.” (S09)

Rauch and Frese (2007) confirm that *tenacity* is a trait matched to entrepreneurship. *Tenacity* involves sustaining energy and action even if obstacles occur (Baum & Locke, 2004). “Endurance and perseverance. An athlete knows how long you have to keep it going” (S05), “Every day I take one step more than my competitors. Every day one step more and at some point, that will be enough.” (S07)

The athletes reported on the learning process of *structuring and prioritization* in their first career. One participant outlined the necessity for rigorous prioritization, “It didn’t matter if my best friend was getting married or my mother had her fiftieth birthday, if I had to play, I wasn’t able to make it” (wording altered by the author to safeguard anonymity). Respondent S03 reported the importance of concentrating on personal strengths, “Reflect on your strengths, eliminate weaknesses...A weakness will never become a strength”. Respondent S07 learned how to plan and structure the day, “Planning is extremely important in sport...I have planned each and every day, and that is what I took away and learned [to transfer to] being an entrepreneur”. In relation to business, S05 concluded, “Better to slow down a little, but establish a structure so you can build that up long-term”, and S09 stated that they “had a clear distribution of tasks”.

Kerr, Kerr, and Xu (2018) excluded the trait *discipline* from their review of personality traits of entrepreneurs because the research was too sparse to summarise meaningfully. Nevertheless, *discipline* was an often-mentioned trait in the interviews informing this study. Seven of the eleven participants reported a high level of *discipline* being positively related to career transition, and all seven linked the trait to their first career. “That’s what I learned as a

professional athlete. You have to get up and get going, every day...then it works.” (S12). Interestingly, one participant considered *discipline* to be negatively correlated to the career transition.

Risk-taking has been investigated in relation to athletes and entrepreneurs in many contexts (e.g., Crust & Keegan, 2010; Mastroleo et al., 2013; Hatfield & Fernandes, 2009). Steinbrink, Berger, and Kuckertz (2020) compared the risks facing both athletes and entrepreneurs: financial, social, health, and career risks are all forms of risk an athlete experiences and copes with during their career. *Risk-taking propensity* was mentioned by ten of the eleven participants as something positively influencing the career transition “if you do something like that, you have to go all-in” (S02); five of the ten linked that trait to their first career, “You get used to uncertainty. Before a competition you don’t know how it will turn out. You learn to deal with it” (S07).

Team spirit was named by eight interviewees and identified as having a positive relationship with a career transition, “I have always managed to keep people together in my company. If not primarily with money, then with *team spirit*.” (S07); “no-brainer, like the fact that you can only get something going together in a team, never alone” (S05). Team spirit is clearly linked to the first career as an athlete as seven out of the eight participants mentioned that positive causal relation from experiencing teamwork within the sport. In that context, *team spirit* was often mentioned in the context of success “It’s important that the team functions and it is not a case of you as an individual standing out because that would not lead to success” (S11); Respondent S06 spoke of hitting “high-performing team mode”.

Openness to experience describes the tendency to seek and explore new experiences and ideas. Zhao and Seibert (2006, p. 261) describe people with a high level of *openness to experience* as “creative, innovative, imaginative, reflective, and untraditional.” Five interviewees mentioned a causal relation between their *openness to experience* and the career transition, “always reinventing themselves and trying to change things” (S02), “I am simply a free thinker. I have always had ideas, different ideas from other people.” (S07).

Overconfidence can be measured by a comparison of a person’s subjective self-perception and objective test scores, and actual task performance (Krueger & Mueller, 2002). If the self-perception is not justified by actual performance, a person is considered overconfident. As comparative measures are beyond the scope of this study, the coding *self-confident* was chosen, although some statements might indicate a very high level of confidence “In the beginning, I went out there and said: Let’s see if they like me. Today I go out and say: let’s see if I think they’re good.” (S03). Athletes with high *self-confidence* believe in the ability to control themselves and the environment (Besharat & Pourbohloul, 2011). Within this study, five

participants reported a high level of self-confidence, and all perceived that fact as a positive factor during a career transition.

People with a strong *need for achievement* can be described as having a high standard of excellence and are often willing to take on challenging tasks, resulting in competitive behavior (McClelland, 1961; Jackson, 1974). Seven interview partners mentioned the causal relationship with a *need for achievement* during their career transition, but interestingly, only two respondents linked the trait to their first career. The other respondents mentioned a strong *need for achievement* as a pre-existing personality trait.

The concept of responsibility was linked to achievement motivation or need for achievement in earlier research (Rauch & Frese, 2007). McClelland (1961) mentioned the tendency of people who behave entrepreneurially to take responsibility for actions, whether they result in success or failure. In this study, *self-responsibility* was expressly cited by five participants, and accordingly, it was not subsumed under *need for achievement*. The positive causal relation between *self-responsibility* and career transition reached the minimum value of five, but the fact that only three participants linked that higher level of *self-responsibility* to their career as an athlete supports previous findings of the independent occurrence of a *need for achievement*.

Causes

Outcome expectations

In comparison to *creation*, creativity requires additional elements, such as engagement, practice, and time; in that, it might take a long time before creativity leads to *creation* (Walia, 2019). Creativity can be considered a trait. Agreeing with the meta-analysis of Rauch and Frese (2007), who found that creativity as a trait is not matched to entrepreneurship, creativity is also not represented within the model of this study. However, the outcome expectation of *creation*, meaning the wish to create something new, is mentioned by five participants, for example, “building up something of my own was my primary intention and motivation” (S09) and “build cool experiences” (S06).

Cited by nine of eleven athletes, *independence* is a strong motivational driver of a career transition to entrepreneurship: “I no longer want to have a boss on whom I am dependent” (S01), “Freedom, absolute freedom...I need the freedom to think, freedom to act like an entrepreneur” (S07), “In the first place, what was important to me was *independence*” (S05) and “self-reliance and independence” (S02).

A change in expected outcome was reported by most participants in some way, but because expectations of outcomes were coded separately, nearly every change within the map was an individual one. So no concordance could be identified between specific outcome expectations.

Transition condition

Contextual factors influencing the career transition were identified through the description of the athletes' route into entrepreneurship. Opportunity recognition can be differentiated as passive and active forms. The former relies on serendipitously discovering opportunities and the latter on systematically searching for them (Terán-Yépez, Jiménez-Castillo, & Sánchez-Pérez, 2021). The statements of five athletes were coded as *active opportunity recognition*, in the sense of actively searching for development: "Where is the chance to learn something? What can you gain there?" (S05) or transferring existing ideas into new markets "Why is this not available here or in a different format?" (S06). The situations prompting that *active opportunity recognition* varied and included intentionally abandoning the first career or the need for reorientation, negative employment experience, and *external risks and dependencies*.

Contextual stability can relate to people such as a role-models from the sport or co-founders who work in the same branch of the sport or the business. The entrepreneurial venture of six participants was in the sports context, and those ventures included establishing training centers, developing training devices, or offering services for athletes.

A hybrid entrepreneur is still working for a salary while simultaneously engaging in entrepreneurial activity (Demir, in press). Our respondents took different paths after their first career as professional athletes: Some tried to work with firms or became trainers in the sports context but often found the career change unfulfilling. Others embarked on their first entrepreneurial venture while still an athlete. Seven of the eleven participants described adopting an *iterative/hybrid* approach: "we developed that relatively slowly, but over a long period of time. We started and had initial discussions, of course in the evenings and on weekends while we were still working for a wage. And then we reached the point to say: come on, we'll try this" (S08).

The CSM model of Lent and Brown (2013) also contains contextual support and barriers that influence self-efficacy, expected outcomes, goals, actions, and concrete outcomes. From the perspective of female founders, Neumeyer et al. (2019) argued that building social capital within ecosystems is a relevant contextual factor. Nahapiet and Ghoshal (1998) consider social capital "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (p. 243). Social capital includes different dimensions such as relational, cognitive, and structural forms (Nahapiet & Ghoshal, 1998). Structural social capital involves relations among and between individuals. Relational social capital in the context of sport can, for example, be norms and trust between teammates that are transferable between different social groups (Nahapiet & Ghoshal, 1998). The cognitive dimension would incorporate a shared form of language within the group/team, and the structural component would include network ties forged during the

sports career. In addition to social support, occupational barriers and socioeconomic resources are also contextual factors within the CSM model. In this study, the transition conditions encompass the whole framework the athletes are acting within. In the content of social capital, *personal fame* was cited six times as an advantage, “it can always be an advantage if you at least get a story” (S06) and once as a disadvantage “of course, you also have those who envy you” (S04). *Media presence* was cited five times, always with a positive relationship to career transition “your name is being played everywhere, and since you are world champion, everyone wants to feature you” (S04).

Effects

The only shared effects were contextual in nature. *External risks and dependencies* were named by five respondents, regarding markets “and at the beginning of 2000 the dot-com bubble burst and everyone suddenly got scared” (S07), customers “at the end of the day, you’re dependent on the customers” (S02) and personal circumstances. Six sports entrepreneurs chose to *exit* their first firm for different reasons, three *exits* were explained by *external risks and dependencies*.

3.5 Discussion

This study identifies three categories of causes (skills and traits, transition conditions, and outcome expectations) in its attempt to identify drivers of and barriers to sports people’s transition to an entrepreneurial career. The high number of skills and traits mentioned (see Table 3-1) indicates that concepts within that category are crucial drivers with a high degree of subjective importance for the sportspeople interviewed.

Development of coping strategies

The importance of coping strategies in explaining entrepreneurial decisiveness was shown by Pérez-López, González-López, and Rodríguez-Ariza (2019) within the frame of the CSM model. If *resilience* is accepted as a learnable competency (Masten, 2001; Egeland, Carlson, & Sroufe, 1993), different aspects that might explain and develop the concept of *resilience* should be examined. González-López, González-López, and Rodríguez-Ariza (2019) suggest that *resilience* can be developed by strengthening competencies like *self-confidence* and focusing on learning from failure with the consequence of learning coping strategies. Various internal aspects (e.g., experiences of power and control) and external aspects (e.g., access to material resources) can strengthen *resilience* (Ungar et al., 2007; Hedner, Abouzeedan, & Klofsten, 2011). Coping has a significant impact on the *resilience* of professional athletes (Belem et al., 2014). Sarkar and Fletcher (2014) conducted the first review on *resilience* among sportspeople and identified stressors and protective factors. The main psychological factors

protecting against stressors “[a] positive personality, motivation, confidence, focus and perceived social support” (p. 1425) were found to help athletes to assess stressful situations as challenges. The identified causal relationship between *failure experience* and *resilience* (see Figure 3-4) supports the notion that coping with failure seems to be a crucial factor in building *resilience*. Our study also identifies further influencing factors cited in prior research as being positively related to entrepreneurship. However, they did not reach the critical threshold of five, so for example, three participants linked their first career experience to optimism (representing a positive personality), and two reported optimism had a positive influence on *resilience*.

Confidence is expected to have a positive effect on the emotional resilience of entrepreneurs from failed ventures (Hayward et al., 2010), but failure can lead to overconfidence if entrepreneurs believe failure has provided valuable learning (Nielsen & Sarasvathy, 2016). Bernoster et al. (2018) state that overconfidence and optimism are related but must be distinguished. Optimism is understood as the generalized expectation that positive things will happen (Scheier & Carver, 1985) and was cited by four participants in this study’s data. Studies raise the question of whether *self-confidence* is an outcome or a determinant of an athletic (Newell, 2005) or an entrepreneurial career (Cromie, 2000). Interestingly, neither *optimism* nor *self-confidence* is perceived to be linked to the first career of the interviewees.

In this study, the need for achievement is not connected to the first career but linked to other occasions. One interview partner linked the negative experience of an *exit* from the first entrepreneurial experience to a need for achievement. Another participant reported an identity loss after the end of a career as a professional sportsperson and linked that experience to the need for achievement. Accordingly, an entrepreneurial career might be considered a way of compensating for negative experiences, which can be interpreted as a form of coping strategy.

Support from others was identified as an important coping strategy in prior research (Park, Lavalley, & Tod, 2013; Sarkar & Fletcher, 2014b). Social support can occur in various forms and be derived from different people and institutions; so a person might receive private, institutional, or even public support. But perceived social support seems to play a less important role as a driver of entrepreneurship for athletes within their career transition phase. Only the concepts of *personal fame* and *media presence* achieved the critical value of five. They were considered separately because the correlation between the two is expected to depend on the kind of sport. Athletes from more popular sports such as soccer have a stronger media presence than would rowers, for example. Moreover, negative events as the doping scandal in cycling can generate a greater *media presence*. Four entrepreneurs positively linked the contacts they made within their first career to the career transition, an example being if former colleagues or team members promoted the new business. It has to be mentioned that

contacts made within the first career might be more helpful if the entrepreneur is staying in the sports environment. If the research had focused on sports businesses only, the first career relations might have shown up as more relevant. Private or institutional support or entrepreneurial background were mentioned in some cases but surprisingly fell short of the critical value of five. It is impossible to be sure whether the athletes experience less support or assess the importance of such support to be lower. Nevertheless, it can be said that the lack of private or institutional support was also not identified as a barrier to an entrepreneurial second career.

To summarise, the experiences of athletes, and the obstacles they face, call for them to employ coping strategies, which can be essential resources to transfer into an entrepreneurial career.

Keeping the person-environment fit

In the context of career decisions, the person-job fit is one important fit comparing individuals' abilities and the demands of their job (Kristof, 1996). However, the person-environment fit is a multidimensional construct (Jansen & Kristof-Brown, 2006; van Vianen, 2018) that compares the fit between individuals and their environment on different levels such as preferences, attitudes, or values alongside culture or work characteristics (van Vianen, 2000). Referencing person-job fit theory, Steinbrink, Berger, and Kuckertz (2020) emphasized similarities between entrepreneurial demands and athletes' psychological characteristics. However, considering the larger perspective of person-environment fit, other arguments come into play. As an expression of an individuals' self-concept (Parasuraman, Greenhaus, & Linnehan, 2000), the career path is influenced by selection and socialization processes (Baluku et al., 2019). Therefore, it is assumed that experienced job demands, available personal resources, or values socialized during a sports career lead to the selection of a second career choice with similar job characteristics.

One aspect of person-environment fit is person-team fit. In line with van Vianen (2018), in this study, the person-team fit is understood as the fit between individuals' skills and traits, outcome expectations, values, and demographics. *Team spirit* is an overarching term including many perspectives (Silva et al., 2014). Teams and their team members face the challenge of reconciling individual and collective interests. Within a sports team, individuals have to optimize their own performance (e.g., to secure their position in the team, to develop their career, and to safeguard their performance-related salary) but also have a responsibility to help boost the team's performance. Respondent S09 noted that trade-off, "Even if you end up being a team, at the beginning you are also competitors." The data of this study reveal a considerable variety of answers around the topic of *team spirit*. Some informants did not consider themselves team players. Others reported positive or negative experiences within teams, but all considered the personal experience of being part of a team within their first

career as having a positive effect on their career transition. That might be explained by an awareness of the personal preferences of team membership and the personal role within a team; knowledge that is important to decide whether a solo entrepreneur career is more suitable for a person or if a team structure would compensate for weaknesses. Those athletes who mentioned a negative team experience preferred to manage the company alone to remain independent. In this context, the fit is not limited to the characteristics of the members of a team per se, but the team preference of the individuals. Each facet of person-environment fit contributes differently but retaining the fit enhances work satisfaction (Rauvola et al., 2020). This advantage of being able to experience one's own preferences within a team can also be found in other team structures outside of sport, such as entrepreneurship education programs.

A high degree of *self-confidence* is a factor of *resilience* (Khoshouei, 2009) but also positively affects the athletes' risk-taking and aversion to failure (Newell, 2005). The linkage found in this study between the first career and the trait *risk-taking propensity* is in line with Kontos (2004) suggesting that an athlete's positive experiences with risk might reduce subsequent perceived risk. As the perception of risk diminishes following the experience of risk-taking (Horvath & Zuckerman, 1993), athletes' abilities match the important job demand of accepting certain risks as an entrepreneur.

In the case of favorable conditions (e.g., social support), outcome expectations can develop to become a motivational factor (Luc, 2020). *Independence* is an essential factor driving individuals towards an entrepreneurial career (Shane, Kolvereid, & Westhead, 1991). Block and Landgraf (2016) found that being motivated by *independence* is positively associated with the career transition behavior of moving from being a part-time entrepreneur to becoming a full-time one. Within this study, *independence* was also identified as an expected outcome and a strong driver of an entrepreneurial career. *Independence* is a job characteristic that features in the careers of both athletes and entrepreneurs. One participant reported experience of being independent in the very earliest stages of being an athlete; being educated at a boarding school involves a separation from home and the duty to be self-reliant and manage one's own affairs and budget (S11). Another participant pointed out that particularly athletes from individual sports have to be independent and self-reliant as they are responsible for their contracts and sometimes responsible for organizing a training structure (S08). It should be mentioned that the degree of *independence* and *self-responsibility* varies between the different sports, but all athletes are forced to make independent decisions concerning their own careers. An athlete's preference for being independent matches the work characteristic of an entrepreneurial career.

The valued outcome expectation of *creation* matches the job characteristics of an entrepreneur. Researching factors that contribute to developing and maintaining the highest

performance levels and also the need to be creative and innovative were identified. The interviews conducted by Durand-Bush and Salmela (2002) revealed aspects including new strategies and skills that must be developed through training if an athlete is to stand out against the competition. Given that participation in training and competitions is time-consuming, often requires travel, and depending on the kind of sport, can be well-paid or not, not only training methods have to be creative; athletes also have to be creative with regard to their daily structure and income.

The aspect of *contextual stability* emerging from the data in relation to the sportsperson's business idea was expected as effects of social capital on opportunity recognition as well as knowledge about markets and future trends (Puhakka, 2006). For example, athletes must resolve issues in the context of their sport, such as those relating to sports equipment. Athletes also know about the specific issues affecting their chosen sport, as Hardy, Jones, and Gould noted, "Elite athletes do not live in a vacuum; they function within a highly complex social and organizational environment, which exerts major influences on them and their performances" (1996, pp. 239–240). Studies confirm the presence of individual cultures within specific sports (e.g., Larsen et al., 2013; Zevenbergen, Edwards, & Skinner, 2002) and sub-cultures like language or particular habits develop within different sports and kinds of teams. Athlete entrepreneurs know that culture well and also know their stakeholders very well. Another factor might be that the contextual knowledge on a particular branch of sport might enhance *self-confidence*, as reported by one participant, "You continue to move in a very safe environment, you just change sides" (S03).

To conclude, it is essential to note that all identified shared relations are positive, so only drivers were identified within this study. That is not to suggest that athletes do not face any barriers to entrepreneurship. Although a focus on the first career can lead to educational disadvantages (Park, Lavalley, & Tod, 2013) and a lack of professional experience compared to non-athletes, the athletes seem to be able to access other skills and traits that compensate. As explained above, athletes have good coping capacities and strategies, are willing to accept a new situation, focus on positive aspects, and move forward. In addition, the fundamental concept of *resilience* helps athletes accept the situation and not focus on barriers. A high level of optimism (cited by four participants as positively related to career transition) and *self-confidence* might also lead to positive perception and a focus on drivers rather than barriers.

Limitations and future research

In summary, many issues professional athletes experience during their careers should theoretically equip them to develop successful coping strategies to address obstacles. *Resilience* was very often mentioned by our informants. Therefore, it is concluded that *resilience* is an essential driver of the decision to pursue an entrepreneurial career. Korber and

McNaughton (2018) undertook a systematic literature review addressing *resilience* and entrepreneurship and identified a lack of specificity in the research about the construct. In the context of learning from failure, Lattacher and Wdowiak (2020) highlighted resilience as under-researched. To specify the construct of *resilience* and build knowledge about it, future research should address that topic. The specific context of athlete entrepreneurs might be an appropriate homogenous sub-group to conduct research. There would appear to be no published research bridging the gap between using the learned *resilience*, acquired in a first career, within the career transition into a new one. For future research, a focus on the *resilience* of athletes, the explanatory variables, and the opportunities to learn could offer valuable insights into how non-athletes might develop that important ability of resilience.

Six participants had already exited their business at the point of the interview. An *exit* could be positive as in deciding to sell the business to commence a new venture or negative as in the business failing or entering liquidation; the reasons for that decision are even more diverse than the options around the notion of an *exit*. Those six participants described different motives or circumstances leading to the exit point, so no shared causal relation could be identified. Interestingly, only two of the eleven athletes were not engaged in entrepreneurial activities at the time of the interviews. So four athlete entrepreneurs became habitual entrepreneurs with further ventures and proceeded along the entrepreneurial path. One of them is still running the first business and continues to pursue new ideas. Future research that could identify the factors leading to an *exit* would be very interesting and could perhaps impact unplanned *exits*. This study identifies the prerequisites; a future research project might focus on ongoing advantages or bumps along the entrepreneurial way.

3.6 Conclusion

This study complements existing entrepreneurship research by commencing an identification of the skills and traits, outcome expectations, and transition conditions that serve as drivers of and barriers to the process of a career transition from a limited first career as a professional athlete to one based on entrepreneurship. The finding isolating the diverse facets of the person-environment fit mentioned as drivers of the transition process from athlete to entrepreneur contributes to the entrepreneurship literature. The identified advantage of athletes' knowledge and use of different coping strategies offers an essential foundation on which future research could build. Furthermore, the findings accentuate that both socialization and selection influence career transition decisions and processes for athlete entrepreneurs. The distinction between first career learning and pre-existing skills and traits could provide a basis for future research on the factors facilitating entrepreneurship that can be first accessed as a professional athlete. Entrepreneurship education could benefit from developing greater

awareness of the drivers that can influence prospective founders of ventures and the capability of those drivers regardless of the first chosen career.

4 The entrepreneurial intention of top athletes—does resilience lead the way?

Authors

Kathrin Steinbrink, Celine Ströhle

Abstract

Some jobs have a higher level of challenges and adversities. Individuals pursuing these jobs learn how to react to challenges and build up resilience. Within this study, we concentrated on the career transition of top athletes to entrepreneurs, who are both expected to have a higher level of resilience than non-athletes. The purpose of this research was to examine if resilience is a determining factor on entrepreneurial intention and if the model based on the Theory of Planned Behavior (TPB) can be applied in general and for specific groups with a high level of resilience. To address the research questions, we collected data from a sample of 195 top athletes and 142 non-athletes. First, the level of resilience and the entrepreneurial intention was compared with an analysis of variance (ANOVA). Subsequently, the structural equation model tested the influence of resilience on entrepreneurial intention, mediated by the TPB, first for the whole sample and then as a multigroup comparison for both groups. Resilience had an indirect influence on entrepreneurial intention, mediated by the explaining factors of the TPB (personal attitude, subjective norm, perceived behavioral control). The multigroup comparison revealed a difference in the influence of perceived behavioral control on entrepreneurial intention between top athletes and non-athletes. Based on these results, this research added further knowledge to the field of entrepreneurial intention by examining the specific role of resilience necessary for careers as top athletes and entrepreneurs. It also contributes by researching the specific group of top athletes compared to non-athletes and extrapolating recommendations in entrepreneurship education for both groups, as creating athletes' awareness of potential overconfidence or implementing resilience training in education for non-athletes.

Keywords

Athlete entrepreneurship, Theory of Planned Behavior, Career transition, Structural equation modeling, Multigroup comparison, Top athletes, Resilience

Article Information

This section is based on the manuscript, which currently is in the R&R process at a B/C-ranked journal according to VHB JOURQUAL 3.

4.1 Introduction

“When one door closes, another opens; but we often look so long and so regretfully upon the closed door that we do not see the one which has opened for us” (Alexander Graham Bell). Applying the quote by Alexander Graham Bell on career transition, two essential facts can be identified. First, there will always be a door from which to proceed. Second, do not waste time on regret, accept the closed door, and choose the next option. Some professions are curtailed or limited, and individuals are forced into occupational re-orientation. This limitation affects professional athletes for different reasons, such as declining performance due to aging, accidents, illness, or personal reasons. Evidence suggests that entrepreneurship is a popular second-career option for professional athletes (Kenny, 2015), who seem well-equipped for this career (Steinbrink, Berger, & Kuckertz, 2020).

When considering the person-job fit theory with a positive assessment of a job environment being a fit between a person’s abilities and a job’s demands (Kristof, 1996), an entrepreneurial career for former top athletes seems even more likely. Success as an athlete often translates into success as an entrepreneur (Bernes et al., 2009). Both experience and personality influence the entrepreneurial intention of athletes (e.g., Ardichvili, Cardozo, & Ray, 2003; Kerr, Kerr, & Xu, 2018). Entrepreneurs face the risk of failure in general and operate daily in a changing environment, dealing with uncertainty and incomplete information (Ayala & Manzano, 2014). This experience is similar to an athlete's (Fletcher & Hanton, 2003). Within the context of professional sports, stressors range from daily demands to major life events (Sarkar & Fletcher, 2013) and can be classified into three categories: competitive performance (e.g., performance expectations, loss of form, rivalry), organizational (e.g., finances, interpersonal conflicts), and personal stressors (e.g., social contacts, injury) (Fletcher & Sarkar, 2012). One crucial aspect both jobs have in common is resilience.

Prior research has shown that resilience helps entrepreneurs overcome adversity (D’andria, Gabarret, & Vedel, 2018) and achieve career success (Salisu et al., 2020). However, researchers have called for more research on personality traits in the context of sports entrepreneurship (Ratten & Tajeddini, 2019). Although numerous studies on the resilience of athletes can be found (Galli & Gonzalez, 2015), most research focuses on the current situation of being a sports student (Gonzalez, Detling, & Galli, 2016), coach (Sarkar & Hilton, 2020), or athlete (Belem et al., 2014; Brown, Lafferty, & Triggs, 2015). In their meta-analysis, Korber and McNaughton (2017) identified six research streams within the discussion of entrepreneurship and resilience, e.g., antecedents of entrepreneurial resilience (as traits or characteristics) or resilience as a determinant of entrepreneurial intention. Resilience influences entrepreneurial intention in different contexts, such as adverse political (Bullough, Renko, & Myatt, 2014) or economic situations (Bullough & Renko, 2013). Additionally, the positive relationship between

sports and the entrepreneurial intention was examined in sports students (González-Serrano et al., 2018; Naia et al., 2017; Teixeira & Forte, 2017), but no research was found on top athletes. Korber and McNaughton (2017) stated that more research is needed to understand the multiple dimensions of entrepreneurial resilience.

Resilience in both research fields, sports and work, has been comprehensively researched within an interdisciplinary meta-analysis of over 52 studies (Bryan, O'shea, & MacIntyre, 2019). Nevertheless, no study has combined resilience as a result of previous experience as an athlete and the transition of that skill into a new field of work. This study aimed to widen the scope of this field and research resilience as a gained skill that can be transferred for further career options after a sports career. In this case, the influence of resilience on entrepreneurial intention, or the willingness to start a firm, was researched in general and in top athletes. Furthermore, we contributed to the discussion on TPB in two ways. First, the influence of an additional variable within the TPB (resilience on intention, mediated by personal attitude, subjective norm, and perceived behavioral control) was tested. Then, the model was researched within the professional sports environment with its specific adversities and stressors.

In summary, this research sought to determine if resilience is a defining factor of entrepreneurial intention if the TPB mediates this relationship, and if the model can be applied in general or for specific groups with a high level of resilience on a homogenous sample of top athletes.

4.2 Theoretical framework

Resilience and the Person–Job Fit

Sarkar and Fletcher (2013) pointed out that resilience is based on the presence of adversity and positive adaptation. Resilience is conceptualized as a personality trait (e.g., Ayala & Manzano, 2010; Shin, Taylor, & Seo, 2012) but also as a process that is able to change over time (e.g., Brewer & Hewstone, 2004; Luthar, Cicchetti, & Becker, 2000). This changeable process includes that resilience varies contextually (depending on the situation) and temporally (during a specific situation and as a lifespan process) (Bonanno et al., 2010; Hobfoll, 1989). In their grounded theory on the resilience of Olympic champions, Fletcher and Sarkar (2012) combined both perspectives (trait and process) and suggested an influence of numerous psychological factors on the relationship between stress and resilience. According to Fletcher and Sarkar (2012), we understand resilience as “the role of mental processes and behavior in promoting personal assets and protecting an individual from the potential negative effect of stressors” (p. 675).

Athletes build up emotional capital during their career, supporting them to overcome obstacles and hurdles (Ratten, 2015). Dirmanchi and Khanjani (2019) found a significant difference in resilience between athletes and non-athletes with spinal cord injuries. Galli and Vealey (2008) found that high-level athletes faced adversities and experienced negative psychological effects but also developed a range of coping strategies to deal with those situations. As a result, athletes experienced growth and improvement, underlying the developmental process of resilience within sports. Considering resilience as a changing and learnable skill (Gu & Day, 2007; Luthar, Cicchetti, & Becker, 2000), we expected a higher level of resilience in top athletes who used to be confronted with stressors and hypothesized that:

H1a: the level of resilience is higher in top athletes than in non-athletes.

The investment in human capital affects the motivation towards an entrepreneurial career but is influenced by culture (Pinzón, Montero, & González-Pernía, in press). Do Paço et al. (2015) examined the entrepreneurial intention of girls attending a business school compared to boys attending a sports school without entrepreneurship education. The authors concluded that other factors influencing entrepreneurial intention have to be considered. According to the person-job fit theory, jobs with suitable demands for a person's abilities are compatible (Kristof, 1996); jobs that fit are expected to be assessed positively by an individual. Entrepreneurs face the risk of failure in general and operate the daily business in a changing environment, dealing with uncertainty and incomplete information (Ayala & Manzano, 2014). Specific psychological characteristics are expected of entrepreneurs, as they have chosen a path containing risks and adversities (Bulmash, 2016). Based on the person-job fit and Steinbrink, Berger, & Kuckertz's (2020) findings, athletes are expected to consider entrepreneurship a suitable career option. In agreement with Pellegrini et al. (2020), who identified different reasons for a higher entrepreneurial intention in athletes within their literature review, it was hypothesized that:

H1b: the level of entrepreneurial intention is higher in top athletes than in non-athletes.

Theory of Planned Behavior

In general, intention can be defined as "a person's readiness to perform a [given] behavior" (Ajzen, 2011, p. 1122). More specifically, entrepreneurial intention is understood as the awareness and determination of an individual's conscious awareness and determination to create a new venture. Explaining the entrepreneurial process and, therefore, the intention with only personality variables is highly complex. In a previous study, individual and situational variables showed poor predictive validity and explanatory power (Krueger, Reilly, & Carsrud, 2000). Therefore, a mediating role of variables explaining entrepreneurial intention is suggested (Munir, Jianfeng, & Ramzan, 2019). A widely used and validated model predicting entrepreneurial intention is TPB, which was applied here following Ajzen (1991). Within this

model, the entrepreneurial intention is based on the personal attitude towards entrepreneurship, the perceived behavioral control, and the subjective norm (Ajzen, 1991).

Personal attitude reflects the individual's (favorable or unfavorable) evaluation of the behavior (Ajzen, 1991) or is their personal attitude towards entrepreneurship.

Subjective norms reflect the social components within the TPB. This term refers to the perceived normative beliefs of the individual's social reference group regarding whether to engage in the behavior (here entrepreneurship) or not (Ajzen, 1991). The social reference group can be family and friends. However, in case of athletes, trainers, sponsors, media, and the public can also be perceived as a reference group generating social pressure to perform (Hayes et al., 2020). The role of the subjective norm within the TPB is unequivocal as several studies found no significant relationship between subjective norm and entrepreneurial intention (e.g., Autio et al., 2001; Krueger, Reilly, & Carsrud, 2000).

The concepts of perceived behavioral control, perceived feasibility (Shapero & Sokol, 1982), and self-efficacy (Bandura, 1977) are similar (Dissanayake, 2013). The perceived behavioral control refers to the individual's belief in being able to perform the behavior, and in addition includes the perception of an individual's control of the behavior (Ajzen, 1991). In this context, perceived behavioral control is the individual's belief in being able to start a firm and volitionally control the circumstances. The more individuals feel capable of an activity, the more they are involved in and committed to achieving that activity (Bandura, 1991).

In line with previous studies (e.g., Kautonen, Van Gelderen, & Fink, 2015), we expected personal attitude, subjective norm, and perceived behavioral control to be antecedents of entrepreneurial intention. Therefore, we hypothesized that:

H2: (a) personal attitude, (b) subjective norm, and (c) perceived behavioral control have a positive effect on entrepreneurial intention.

Integration of Resilience in the TPB

Korber and Naughton (2018) examined the relationship between resilience and entrepreneurship, where entrepreneurial intention represents one of the six identified research directions. It is expected that a person with a high level of resilience might consider entrepreneurship as a career path to fulfill the demand of facing stressors/adversities with the skill of resilience. Thus, based on the person-job fit theory and considering the three explaining factors of entrepreneurial intention according to the TPB, a person with a high level of resilience should have a positive attitude towards entrepreneurship. This also applies to the social perspective; resilient individuals are perceived to be able to work under pressure (Gould, Dieffenbach, & Moffett, 2002). This belief in the perception by the social reference group is expected to lead to a positive influence on resilience in the subjective norm. Stress tolerance

has been found to be positively related to perceived behavioral control (Ahmed, Klobas, & Ramayah, 2019), leading to the hypothesis that

H3: resilience has a positive effect on (a) attitudes towards entrepreneurship, (b) subjective norms, and (c) perceived behavioral control.

Jin (2017) studied the effect of psychological capital on entrepreneurial intention and found resilience to be positively and significantly related to intention but did not consider the framework of the TPB. The mediating effect of TPB variables between psychological, cultural, and socioeconomic variables and entrepreneurial intention has been confirmed in several studies (e.g., Ahmed, Klobas, & Ramayah, 2019; Entrialgo & Iglesias, 2016; Gorgievski et al., 2018; Munir, Jianfeng, & Ramzan, 2019). Hlatywayo, Marange, and Chinyamurindi (2017) found resilience to be the only psychological capital construct that added significant value to the prediction of entrepreneurial intention in university graduates. In line with the TPB, it was hypothesized that

H4: the relationship between resilience and entrepreneurial intention is mediated by (a) attitudes towards entrepreneurship, (b) subjective norms, and (c) perceived behavioral control.

Multigroup Comparison

A positive adaption to adversity and resilience-building starts in early childhood and continues by belonging to different communities (Clauss-Ehlers, 2008; Waller, 2001), such as sports teams. Life as an entrepreneur is as highly demanding as it is for athletes. Hisrich, Peters, and Shepherd (2005) highlighted financial, psychological, and social risks in their definition of entrepreneurship. Applying the categories of Fletcher and Sarkar (2012) to entrepreneurs, competitive performance stressors can be market-related, e.g., market shares. Organizational stressors are highly relevant for entrepreneurs, e.g., uncertainty concerning income. Personal stressors might, for example, be personal health issues due to entrepreneurial stress (Cardon & Patel, 2015).

As previously mentioned, a higher level of resilience is expected for athletes, influencing resilience for an entrepreneurial intention (Hlatywayo, Marange, & Chinyamurindi, 2017). Therefore, considering the framework of TPB, we hypothesized that:

H5: the effect size of resilience on (a) personal attitude, (b) subjective norm, and (c) perceived behavioral control is greater in top athletes than in non-athletes.

H6: the effect size of (a) personal attitude, (b) subjective norm, and (c) perceived behavioral control on entrepreneurial intention is greater in top athletes than in non-athletes.

4.3 Methodology

Data Collection and Sample

Data were collected between June and August 2021 via an online survey of 337 people in Germany. Of the participants, 195 were coded as top athletes, and 142 were coded as non-athletes (control group). Based on Steinbrink, Berger, and Kuckertz (2020), interviewees were classified as top athletes by answering “(1) the frequency of training and participation in competitions with a focus on winning, and [either] (2a) the participation in high-level international competitions, [or] (2b) the affiliation to a squad” with yes (p. 866). Two respondents were deleted, answering (1) with no and both (2a) and (2b) with yes. Profession was also considered; if an athlete’s main paid occupation was pursuing a sport, he/she was also classified as a top athlete. Therefore, homogeneity concerning the personal relevance of sport and a high timely focus on sports within the life situation is assumed for the here defined top athletes. The average age was 25.35 years (26.01 for top athletes, 24.87 for non-athletes), and in sum, 67.06% were female (131 top athletes, 95 non-athletes), and 32.94% were male (64 top athletes, 47 non-athletes). Participation was voluntary, and to ensure confidentiality, all questionnaires were anonymous.

Table 4-1 Sample characteristics

| | top athlete | | non-athlete | | sum | |
|-------------|-------------|--------|-------------|--------|----------|--------|
| | absolute | in % | absolute | in % | absolute | in % |
| n | 195 | 100,00 | 142 | 100,00 | 337 | 100,00 |
| m | 64 | 32,82 | 47 | 33,10 | 111 | 32,94 |
| w | 131 | 67,18 | 95 | 66,90 | 226 | 67,06 |
| average age | 24,87 | | 26,01 | | 25,35 | |

Measures

A 10-item short version of the original CD-RISC survey by Connor and Davidson (2003) was developed by Campbell-Sills and Stein (2007) to measure the multidimensional construct of resilience and is widely used within the research fields of sport and entrepreneurship (e.g., Gucciardi et al., 2011; Salisu et al., 2020; Schippers et al., 2019). As the questionnaire was conducted in German, the German translation by Sarubin et al. (2015) was applied. With an α Cronbach of 0.90 for 25 items and 0.84 for ten items, the internal consistency of both versions in the German language was confirmed. The reliability was also tested with a test-retest

measure and confirmed for both versions (Sarubin et al., 2015). The survey length was reduced by choosing the short version to achieve an increased response rate.

The entrepreneurial intention questionnaire, developed and validated by Liñán and Chen (2009), is a widely used questionnaire measuring entrepreneurial intention including the antecedents personal attitude, subjective norm, and perceived behavioral control (e.g., Al-Jubari, Hassan, & Liñán, 2019; Hassan et al., 2020; Krasniqi, Berisha, & Pula, 2019) and was applied here.

As control variables, entrepreneurial background and experience (both dichotomous) were integrated into the model. Conscious of the simplification, we followed Farmer, Yao, and Kung-Mcintyre (2011) to evaluate theoretical or practical experiences of entrepreneurship as a binary variable (yes or no) prior to the survey.

To prevent distortion and reduce the possibility of an alternative explanation for the results (Becker, 2005; Schmitt & Klimoski, 1991), control variables were included as influencing the TPB, in addition to the exogenous variable of resilience. Prior research found a positive relationship between entrepreneurial background and entrepreneurial intention (Feder & Nițu-Antonie, 2017). The entrepreneurial background was defined here by knowing an entrepreneur (in the family or social environment). Another aspect positively influencing the explaining factors of the TPB is the entrepreneurial experience (Miralles, Giones, & Riverola, 2016). Therefore, we explicitly asked about entrepreneurial experiences. As some studies explained the direct influence on entrepreneurial intention (e.g., Altinay et al., 2012; Garaika, Margahana, & Negara, 2019; Rasli et al., 2013) and others via the TPB (Fini et al., 2012; Miralles, Giones, & Riverola, 2016; Zhang, Duysters, & Cloudt, 2014), this study included all possible paths for initial testing on controls.

Data Analysis

All questions were mandatory to ensure no missing values. First, the data were checked for normality with Cook's Distance using SPSS. No outliers were identified, as no value exceeded 0.57. The critical value was 1 (Norušis, 2006).

An analysis of variance (ANOVA) was executed in SPSS to first check for differences in top athletes' resilience and entrepreneurial intention compared to non-athletes (H1a–b). Second, confirmatory factor analysis (CFA) was conducted to validate the convergent and discriminant validity of the measurement model. The measurement model contained the factors and correlations between the latent variables of the model. Subsequently, the structural model was built, and H2 and H3 were tested with the maximum likelihood method. The bootstrap procedure was applied to test the mediation (H4a–c) (Cheung & Lau, 2008). For testing H5, a

multigroup comparison was conducted to identify differences between athletes and non-athletes, which were categorized as dichotomous variables.

4.4 Results

Analysis of Variance (ANOVA)

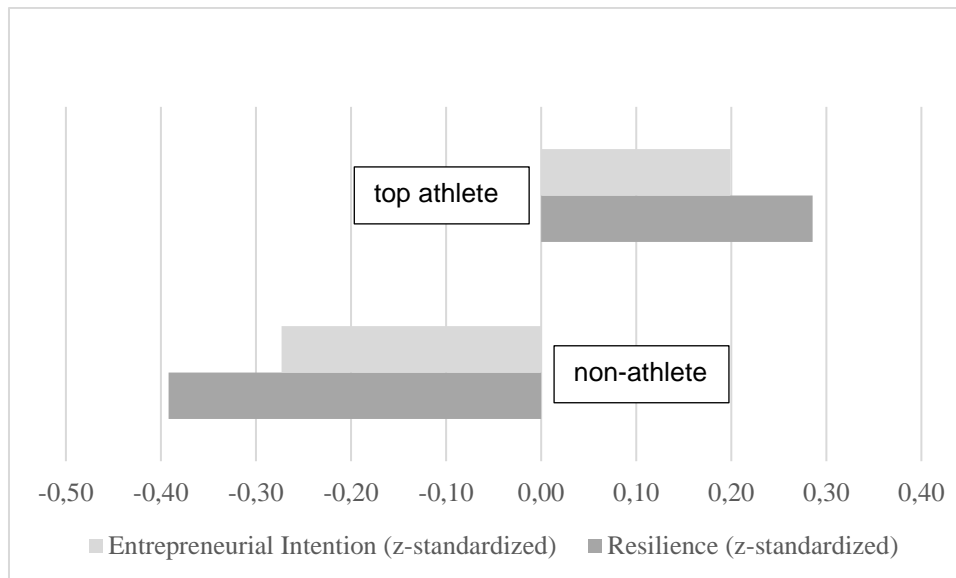
To check for differences between top athletes and non-athletes, an ANOVA was conducted in SPSS. Following Fischer and Milfont (2010), the variables were z standardized. The results (Table 4-2) showed significant differences in resilience and entrepreneurial intention between the groups of top athletes and non-athletes ($F_R[1,335]=42,363, p=0.000$; $F_{EI}[1,335]=19,314, p=0.000$). As shown in Figure 4-1, there was a greater difference between top athletes and non-athletes for resilience than for entrepreneurial intention. Therefore, hypotheses 1a and 1b were supported.

Table 4-2 Results of the ANOVA of resilience and entrepreneurial intention between top athletes and non-athletes

| | | SS | df | MS | F | Sig |
|---------------------------|----------------|-----------|-----------|-----------|----------|------------|
| Resilience | Between groups | 37.719 | 1 | 37.719 | 42.363 | 0.000 |
| | Within groups | 298.281 | 335 | 0.890 | | |
| | Total | 336.000 | 336 | | | |
| Entrepreneurial intention | Between groups | 18.316 | 1 | 18.316 | 19.314 | 0.000 |
| | Within groups | 317.684 | 335 | 0.948 | | |
| | Total | 336.000 | 336 | | | |

SS = sum of squares, df = degrees of freedom, MS = mean square

Figure 4-1 Level of Resilience and Entrepreneurial Intention for top athletes and non-athletes



Structural Equation Modeling

Common method bias

Harman's single-factor test (Harman, 1976) for common method bias was performed with SPSS 25. 42.45% of the variance was explained by loading all variables on a single factor. Common method bias is expected if more than 50% of the variance can be explained (Podsakoff et al., 2003). Additionally, common method bias was checked with AMOS, showing a very poor model fit ($\chi^2=4600,678$, $p=0.000$, CFI=0.403, GFI=0.275, AGFI=0.206, RMSEA=0.217, SRMR=2021, PCLOSE=0.000) (Biraglia & Kadile, 2017; Kumar & Shukla, 2019). Therefore, common method bias was expected not to be an issue in this study.

Measurement model analysis

Due to improvable model fit, covariances between the error terms were added; two items (R5, PBC1) were removed due to low loadings, and after checking for residual covariances, R3 and R7 were also removed. Model fit indices can be classified into absolute, incremental, and parsimony fit indices (Hair et al., 2019). According to Hair et al. (2019), at least the χ^2 with the associated degrees of freedom (df) and one fit index of each category should be displayed to report the model fit. Lower values are desirable for badness-of-fit indices (χ^2 , RMSEA, SRMR) as they measure error or deviation. In contrast, goodness-of-fit indices (CFI, TLI, AGFI) range from 0 to 1, and values < 0.9 are considered acceptable (Malhotra 2010). The adjusted measurement model showed a satisfactory fit for all three categories of model fit ($\chi^2=5483.932$,

df=274, CMIN/df=1,766, RMSEA=0.048, SRMR=0.0366, CFI=0.972, TLI=0.967, AGFI=0.875, PNFI=0.791).

Construct validity

Construct validity was assessed by convergent, discriminant, and nomological validity (Hair et al., 2019). For checking the convergent validity, the average variance extracted (AVE) is a common method for covariance-based models (dos Santos & Cirillo, 2021). The AVE for personal attitude, subjective norm, perceived behavioral control, and entrepreneurial intention was above the threshold of 0.5 ($AVE_{PA}=0.741$, $AVE_{SN}=0.531$, $AVE_{PBC}=0.917$, $AVE_{EI}=0.845$) (Fornell & Larcker, 1981). As Malhotra (2010) argued, AVE is often too strict, and other criteria, such as composite reliability (CR), are also reliable. The slight deviation of $AVE_R=0.497$ could be considered sufficient considering that the $CR_R=0.830$ exceeds the minimum for $CR>0.7$ (Hair et al., 2019). Table 4-3 shows the results of the average variance extracted and the composite reliability.

Table 4-3 Results of the average variance extracted and composite reliability

| Construct | Item | Loading | Composite reliability | Average variance extracted |
|------------------------------|-------------|----------------|------------------------------|-----------------------------------|
| Resilience | R1 | 0.641 | 0.83 | 0.497 |
| | R2 | 0.798 | | |
| | R6 | 0.707 | | |
| | R9 | 0.741 | | |
| | R10 | 0.622 | | |
| Personal Attitude | PA1 | 0.723 | 0.934 | 0.741 |
| | PA2 | 0.904 | | |
| | PA3 | 0.849 | | |
| | PA4 | 0.894 | | |
| | PA5 | 0.918 | | |
| Subjective Norm | SN1 | 0.769 | 0.767 | 0.531 |
| | SN2 | 0.841 | | |
| | SN3 | 0.541 | | |
| Perceived behavioral control | PBC2 | 0.868 | 0.917 | 0.689 |
| | PBC3 | 0.855 | | |
| | PBC4 | 0.894 | | |
| | PBC5 | 0.918 | | |
| | PBC6 | 0.761 | | |
| Entrepreneurial intention | EI1 | 0.846 | 0.97 | 0.845 |
| | EI2 | 0.938 | | |
| | EI3 | 0.914 | | |
| | EI4 | 0.965 | | |
| | EI5 | 0.916 | | |
| | EI6 | 0.931 | | |

The discriminant validity was assessed by comparing the square root of AVE with the correlations between the constructs (Fornell & Larcker, 1981). In table 4-4, the square roots of AVE are presented in the diagonals showing higher values compared to the correlations

presented below them. The significant positive correlations between the constructs support the nomological validity (Hair et al., 2019).

Table 4-4 Square root of AVE and correlations between the constructs testing discriminant validity

| Variable | CR | AVE | MSV | R | PA | SN | PBC | EI |
|----------|-------|-------|-------|--------------|--------------|--------------|-------------|--------------|
| R | 0.83 | 0.497 | 0.28 | <i>0.705</i> | | | | |
| PA | 0.934 | 0.741 | 0.739 | 0.421*** | <i>0.861</i> | | | |
| SN | 0.767 | 0.531 | 0.185 | 0.431*** | 0.291*** | <i>0.728</i> | | |
| PBC | 0.917 | 0.689 | 0.478 | 0.529*** | 0.666*** | 0.338*** | <i>0.83</i> | |
| EI | 0.97 | 0.845 | 0.739 | 0.356*** | 0.860*** | 0.266*** | 0.692*** | <i>0.919</i> |

The diagonal numbers in italic are the square root of the AVE values.

*** = correlation is significant at the 0.001 level

CR = composite reliability, AVE = average variance extracted, MSV = maximum shared variance, R = resilience, PA = personal attitude, SN = subjective norm, PBC = perceived behavioral control, EI = entrepreneurial intention

All path coefficients leading from the latent factors on the items were statistically significant ($p < 0.001$), and the standardized regression weights ranged from 0.539 (SN3) to 0.965 (EI4). Based on the statistics, the model can be considered reliable and valid (Hair et al., 2019).

Structural model analysis

The structural model was built based on the hypothesized paths. The maximum likelihood method was used to test H2(a–c) and H3(a–c). Following a recursive method, at each iteration, the path with the lowest t-statistic was removed until all paths showed a significance of $p < 0.05$ (Liñán & Chen, 2009), except for the hypothesized paths.

There was a significant positive relationship between personal attitude and entrepreneurial intention and between perceived behavioral control and entrepreneurial intention; therefore, H2a and H2c were supported. H2b was rejected, as there was a very small negative effect size from the subjective norm on entrepreneurial intention. The positive effect of resilience on all three antecedents of the TPB was confirmed with a high level of probability. Thus, H3(a–c) was supported.

Table 4-5 Hypothesis with standardized estimates, p-value, and results of the hypothesized paths, including model fit indices

| | Path | Stand. estimate | Estimated standard error | composite reliability | p-value | Findings |
|-----|-------------|------------------------|---------------------------------|------------------------------|----------------|-----------------|
| H2a | PA → EI | 0.746 | 0.050 | 17.500 | 0.000 | Supported |
| H2b | SN → EI | -0.023 | 0.067 | -0.630 | 0.523 | Rejected |
| H2c | PBC → EI | 0.235 | 0.042 | 6.193 | 0.000 | Supported |
| H3a | R → PA | 0.331 | 0.135 | 5.626 | 0.000 | Supported |
| H3b | R → SN | 0.414 | 0.100 | 6.011 | 0.000 | Supported |
| H3c | R → PBC | 0.387 | 0.134 | 6.904 | 0.000 | Supported |

| | Indirect path | Stand. estimate | Lower | Upper | p-value | Findings |
|-----|----------------------|------------------------|--------------|--------------|----------------|-----------------|
| H4a | R → PA → EI | 0.264 | 0.496 | 0.986 | 0.001 | Supported |
| H4b | R → SN → EI | 0.005 | -0.058 | 0.08 | 0.808 | Rejected |
| H4c | R → PBC → EI | 0.119 | 0.207 | 0.473 | 0.000 | Supported |

R²_{EI}=0.744

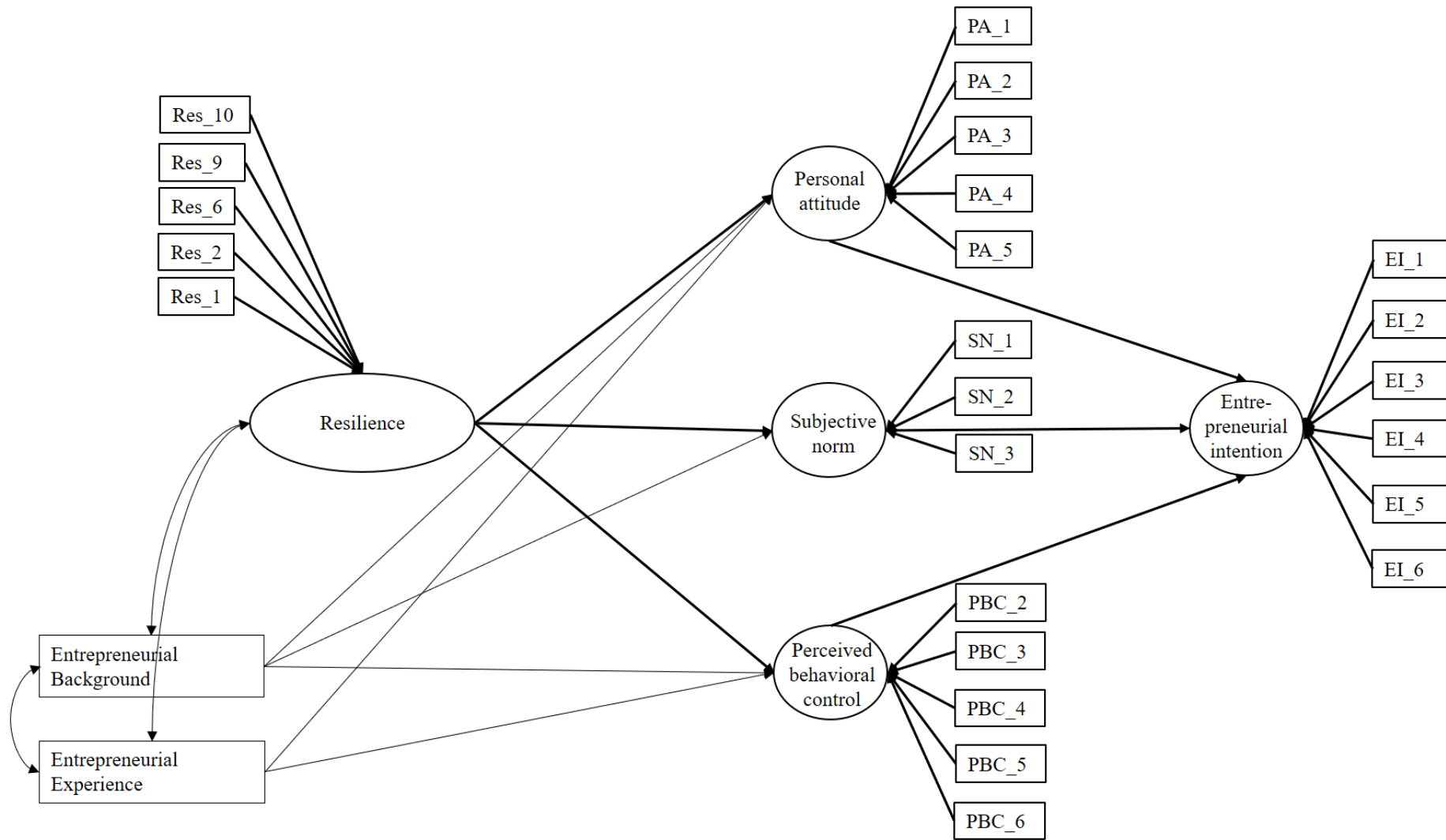
Model fit $\chi^2=554.383$, $df=281$, $CMIN/df=1.973$, $RMSEA=0.054$, $SRMR=0.0797$,
 $CFI=0.963$, $TLI=0.958$, $AGFI=0.963$, $PNFI=0.803$

R = resilience, PA = personal attitude, SN = subjective norm, PBC = perceived behavioral control, EI = entrepreneurial intention

Table 4-5 also presents the results of testing for mediation between resilience and entrepreneurial intention. The total indirect effects of the mediated paths were significant and positive for the mediation of personal attitude and perceived behavioral control, supporting H4a and H4c. However, the construct of the subjective norm was not significant, and therefore, H4b was rejected. In addition, the direct effect between resilience and the entrepreneurial intention was not significant. The relationship between resilience and the entrepreneurial intention was completely explained by full mediation via personal attitude and perceived behavioral control.

This model explained 74.4% of the variance in entrepreneurial intention. Figure 4-2 shows the structural model graphically.

Figure 4-2 Estimated empirical model



Comparing top athletes to non-athletes

After validating the suggested model in general and in consideration of the differences in the means of resilience and entrepreneurial intention, the relationship within the model was compared between top athletes and non-athletes. The multigroup test was also a test on mediation. The moderating variable was the dichotomous variable of top athlete versus non-athlete.

Table 4-6 shows the effect sizes and p-values of both groups. An overall chi-square difference test over the whole model detected a difference in the model for top athletes versus non-athletes ($\chi^2=53,217$, $df=30$, $p\text{-value}=0.006$). A significant difference was observed between the two groups for at least one path. Assessing multigroup differences with CR has been criticized because it only compares one path for both groups and does not consider the other paths within the model (Klesel et al., 2019). Therefore, a chi-square difference test was conducted for all paths to determine which relationships differed significantly (Byrne, 2004).

Byrne and Stewart (2006) suggested the ΔCFI -method and the chi-square difference test to test factorial invariance. The CFI of the model without constraints was 0.952. When constraining the path from resilience to the antecedents of the TPB, the CFI remained 0.952. When constraining the paths within the TPB ($PA \rightarrow EI$, $SN \rightarrow EI$, $PBC \rightarrow EI$), the CFI decreased to 0.951. Although that difference seems marginal, the model fit was reduced when equally constraining the TPB for top and non-athletes.

Table 4-6 Multigroup comparison with standardized estimates and p-value for top athletes and non-athletes, including model fit indices

| Path | Group | Standardized Estimate | SE. | C.R. | p-value |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|--------|---------|
| PA → EI | Top athlete | 0.728 | 0.065 | 13.718 | 0.000 |
| | Non-athlete | 0.766 | 0.075 | 10.677 | 0.000 |
| SN → EI | Top athlete | 0.031 | 0.079 | 0.758 | 0.000 |
| | Non-athlete | -0.065 | 0.102 | -0.996 | 0.319 |
| PBC → EI | Top athlete | 0.290 | 0.056 | 6.074 | 0.000 |
| | Non-athlete | 0.159 | 0.064 | 2.523 | 0.012 |
| R → PA | Top athlete | 0.215 | 0.242 | 2.511 | 0.012 |
| | Non-athlete | 0.374 | 0.179 | 4.221 | 0.000 |
| R → SN | Top athlete | 0.389 | 0.166 | 4.291 | 0.000 |
| | Non-athlete | 0.495 | 0.145 | 4.607 | 0.000 |
| R → PBC | Top athlete | 0.322 | 0.244 | 3.944 | 0.000 |
| | Non-athlete | 0.447 | 0.179 | 5.211 | 0.000 |
| <hr/> | | | | | |
| Top athlete | | | | | |
| R ² _{EI} =0.790 | | | | | |
| Model fit | χ ² =454.659, df=281, CMIN/df=1.618, RMSEA=0.056, SRMR=0.0746, CFI=0.957, TLI=0.951, AGFI=0.816, PNFI=0.775 | | | | |
| <hr/> | | | | | |
| Non-athlete | | | | | |
| R ² _{EI} =0.667 | | | | | |
| Model fit | χ ² =457.018, df=281, CMIN/df=1.626, RMSEA=0.067, SRMR=0.1107, CFI=0.945, TLI=0.937, AGFI=0.765, PNFI=0.753 | | | | |
| <hr/> | | | | | |

As a second method to examine differences in the paths, Byrne and Stewart (2006) suggested the chi-square difference test to constrain each path individually. Table 4-7 shows the results of the chi-square difference test, including the results of the hypothesized paths. As indicated by the ΔCFI, the difference between the groups for the relationship between resilience and personal attitude, subjective norm, and perceived behavioral control was not significant.

Therefore, H5(a–c) was rejected. The significant difference between top athletes and non-athletes, as shown by the overall χ^2 test and suggested by the Δ CFI test, was found for PBC→EI. Thus, H6a and H6b were also rejected, and H6c was supported.

Table 4-7 Hypothesis with results of the chi-square difference test including the results of the hypothesized paths

| Hypothesis | Model description | χ^2 | df | $\Delta\chi^2$ | Δ df | Sign. | Findings |
|------------|----------------------|----------|-----|----------------|-------------|-------|-----------|
| | Unconstrained | 911.818 | 562 | | | | |
| | Fully constrained | 965.035 | 592 | 53.217 | 30 | 0.000 | |
| H5a | R → PA constrained | 912.046 | 563 | 0.228 | 1 | n.s. | Rejected |
| H5b | R → SN constrained | 911.855 | 563 | 0.037 | 1 | n.s. | Rejected |
| H5c | R → PBC constrained | 911.826 | 563 | 0.008 | 1 | n.s. | Rejected |
| H6a | PA → EI constrained | 912.491 | 563 | 0.673 | 1 | n.s. | Rejected |
| H6b | SN → EI constrained | 913.300 | 563 | 1.482 | 1 | n.s. | Rejected |
| H6c | PBC → EI constrained | 914.816 | 563 | 2.998 | 1 | p<0,1 | Supported |

4.5 Discussion and Theoretical Implications

Explaining the Entrepreneurial Intention of Athletes

The role of the subjective norm within the TPB is controversial. Some studies have found a significant direct relation between subjective norm and entrepreneurial intention (e.g., Moriano et al., 2012; Tong, Tong, & Loy, 2011), whereas others have not (e.g., González-Serrano et al., 2018; Liñán & Chen, 2009). Focusing on sports science students, a significant positive relationship of personal attitude and perceived behavioral control were observed on entrepreneurial intention (Gonzalez-Serrano et al., 2018; Naia et al., 2017). Nevertheless, no relationship (Gonzalez-Serrano et al., 2018) or a weak negative relationship at a low level of significance (Naia et al., 2017) was observed between subjective norm and entrepreneurial intention. A possible explanation might be the different contexts in which the TPB was applied (Krueger, Reilly, & Carsrud, 2000). A meta-analysis of social entrepreneurship intention found the subjective norm significant over 31 studies (Zaremohzzabieh et al., 2019). Conversely, Kachkar and Djafri (in press) found subjective norm not significantly influencing the intention for refugees, indicating that the opinion of the refugee community did not determine their

intention to participate in microenterprise support programs. For top athletes, a possible explanation for the non-significant result might be that individuals having strong internal control were less influenced in their intentions by subjective norm (Ajzen, 1987; Krueger, Reilly, & Carsrud, 2000). Strong internal control is expected of entrepreneurs (Entrialgo & Iglesias, 2016). Athletes who exhibit a high sense of internal control or those less controlled by their environment can maintain low stress levels (Holden et al., 2019). Furthermore, athletes who exhibit high levels of self-efficacy and self-confidence are expected to believe in their abilities and athletic performance (Besharat & Pourbohloul, 2011; Fletcher & Sarkar, 2012). Boyd, Harrison, and Mcinerny (2021) identified indicators showing that athletes have a strong belief in their skills for entrepreneurship and gained them within their sports career.

Ajzen (1991) demonstrated that the extent to which perceived behavioral control influences intention varies across situations, stating that “the addition of perceived behavioral control should become increasingly useful as volitional control over behavior decreases” (p. 185). Control beliefs are expected to be influenced by experiences and reduce the perceived adversity of a subsequent situation (Su et al., 2021). Karimi et al. (2014) found differences in the relationship between perceived behavioral control and intention based on culture. The argument of low uncertainty avoidance for Iranians (meaning being less afraid in uncertain situations and having a higher tolerance for ambiguity) compared to other countries (Karimi et al., 2014) can be transferred to context of professional sport. A higher risk propensity is required and confirmed for professional athletes by prior research (Steinbrink, Berger, & Kuckertz, 2020). Therefore, top athletes are expected to feel more capable of facing adversities and coping with the uncertainties of the entrepreneurial path.

The Role of Resilience

In addition, Korber and McNaughton (2017) concluded that resilience might reduce the fear of failure and lead to the entrepreneurial engagement of overconfident entrepreneurs. Our results showed a higher resilience level for top athletes than non-athletes and a positive relationship between perceived behavioral control and entrepreneurial intention. Compared to non-athletes, this influence was found to be significantly stronger, indicating that top athletes were highly influenced in their intention by the level of perceived control over a situation. Therefore, top athletes are expected to be highly confident in their ability to control a situation, such as an entrepreneurial event. Therefore, entrepreneurship education has to increase the awareness of risks and potential obstacles to prevent top athletes from being overconfident and making irrational risky entrepreneurial decisions.

Another indicator that resilience explained entrepreneurial intention was the explained variance. The meta-analysis by Armitage and Conner (2001) analyzed 185 studies using the TPB to explain behavior and intention, showing 29 to 39% of the explained variance. Looking

at the specific context of entrepreneurial intentions, the TPB can explain up to 59% of the variance (Kautonen, Van Gelderen, & Fink, 2015). In their meta-analytical review of over 60 studies with a total sample size of 15423 individuals, Zhao, Seibert, and Lumpkin (2010) calculated an $R^2=0.36$ for the big five personality traits (openness to experience, conscientiousness, extraversion, agreeableness, neuroticism), explaining the entrepreneurial intention. Liñán and Chen (2009) tested different demographic and human capital variables on the antecedents of entrepreneurial intention within the TPB. With the variables of gender, role model (personally knowing an entrepreneur), self-employment experience, and work experience, the antecedents achieved $R^2_{PA}=0.192$, $R^2_{SN}=0.152$, $R^2_{PBC}=0.177$, and $R^2_{EI}=0.555$. Therefore, 55.5% of the variance in entrepreneurial intention and 17,7% in perceived behavioral control were explained by the model Liñán and Chen (2009). The model applied in this study explained 32.1% more of the variance in perceived behavioral control. Therefore, the relevance of resilience is very high for explaining the perceived behavioral control concerning an entrepreneurial event. The R^2 of this study reached $R^2_{EI}=0.744$ for all participants, $R^2_{EI, NO}=0.667$ for non-athletes, and $R^2_{EI, TA}=0.790$ for top athletes. Thus, the explained variance for the entrepreneurial intention of top athletes was 79.0% in the model. This value, being 12.3% higher than for non-athletes, indicated that the expected model implies highly relevant explaining factors for top athletes.

Practical Implications

The great model fit for the overall sample and the group of top athletes could lead to the conclusion that the model based on resilience explained the entrepreneurial intention for top athletes but not exclusively. Considering the results of ANOVA, which showed that both resilience and entrepreneurial intention were greater for top athletes, we expected the model to work well for people with a high level of resilience, notwithstanding how the level of resilience was gained. No significant difference was observed between top athletes and non-athletes in the relationship between resilience and personal attitude, subjective norm, and perceived behavioral control, supporting this presumption. Therefore, all individuals with a high level of resilience, whether gained through competitive sport or other adverse experiences, such as illness or loss, had a positive relationship with the explaining factors of entrepreneurial intention within this study. By strengthening the awareness of resilience and helping people to discover their potential for resilient behavior, their attitude towards entrepreneurship, perceived behavioral control, and normative beliefs about entrepreneurship can be strengthened, leading to a higher entrepreneurial intention. Furthermore, as the strength of the relationship between perceived behavioral control and intention was very high, the level of perceived controllability over an entrepreneurial event should be enhanced to strengthen entrepreneurial intention. As a learnable skill, resilience training should be considered a part of entrepreneurship education for non-athletes.

For the group of top athletes, the need for entrepreneurship education was previously mentioned. With a potentially high level of confidence and fearlessness (Korber & McNaughton, 2017), entrepreneurial risks could be taken carelessly by top athletes. A high level of risk can lead to great success but can also result in failure (Georgiana-Delia, 2013). Motivation towards an entrepreneurial career is needed to support top athletes in their career transition. However, understanding and managing risks should also be considered.

Limitations and Future Research

Intention was found to be the best predictor of actual behavior, which are both considered in the full TPB (Ajzen, 1991). Kautonen, Van Gelderen, and Fink (2015) criticized the scarcity of research on actual entrepreneurial behavior. Additionally, within this study, entrepreneurial intentions were the best approximation for understanding the career transition process of athletes. Future research on the influence of resilience on an entrepreneurial career should further develop this study's findings and include entrepreneurial action. Further longitudinal studies to research the actual entrepreneurial behavior of top athletes should also be undertaken.

The results should be interpreted with caution within the multigroup comparison based on existing limitations. The parsimony fit indices measure the fit compared to its complexity (Hair et al., 2019). A simpler model with fewer variables or estimated parameter paths is suggested to improve parsimony fit (Hair et al., 2019). A remarkable difference in the parsimony fit (see AGFI in Table 4-6) was identified within the multigroup comparison. The absolute fit indices indicate how well a model fits the sample data (Hair et al., 2019). The difference in SRMR was striking. The eligibility of the model can be confirmed for athletes but has to be further explored for non-athletes.

Future research might look at other contexts promoting resilience, such as other job profiles with specific stressors leading to resilience (e.g., army; Lee, Sudom, & Zamorski, 2013) or personal stressors (e.g., illness or victims of domestic abuse; Anderson, Renner, & Danis, 2012) and their influence on entrepreneurial intention.

4.6 Conclusion

Resilience is considered a learnable skill that athletes develop by permanently facing adversities affecting their sports and private lives. Compared to the reference group, the level of resilience and the entrepreneurial intention was higher for top athletes. Overall, this study confirmed that the TPB includes resilience as an additional influencing factor, both in general and for the specific group of top athletes. In addition to contributing to the research field of athlete entrepreneurship, this study also adds knowledge to the discussion of the TPB,

especially concerning the relationship between perceived behavioral control and entrepreneurial intention that differs under the perspective of resilience. Practical implications underline specific requirements of entrepreneurship education for athletes. Resilience and its advantages are not exclusive to athletes as different kinds of adverse events can foster resilience (Seery, Holman, & Silver, 2010). In the case of athletes, adversities are conspicuously present. Therefore, athletes should be aware of their function as role models and discuss their success stories after failure to motivate non-athletes to take risks, fail, and try again, aiming to build a high competence of resilience.

5 Discussion and conclusion

This dissertation aimed to examine affecting factors on the career transition of professional athletes into an entrepreneurial career. This chapter summarizes the main findings and contributions to answer the leading research question. Different perspectives and methodological approaches within the three underlying studies allow conclusions about internal and external factors influencing the entrepreneurial intention and the actual entrepreneurial behavior of professional athletes. This dissertation contributes theoretically and practically to different fields, presented as follows: Section 5.1 provides general considerations on athlete entrepreneurship as an own research stream. 5.2 shows the contributions to the research on the career transition process as well as the practical impact on athletes around their career transition. Section 5.3 focuses on findings contributing theoretically and practically to entrepreneurship education and athlete support programs. Finally, section 5.4 closes this dissertation with concluding remarks.

5.1 Athlete entrepreneurship research

Vanessa Ratten is the leading researcher in sports entrepreneurship with the most articles and the highest citation count (Pellegrini et al., 2020). However, science thrives on many opinions and perspectives. Agreeing with the risk of an elusive and diffuse research field (Hammerschmidt et al., 2020), this dissertation contributes to sports entrepreneurship research by concentrating on one specific perspective. The term athlete entrepreneur is already mentioned; prior studies did initial research on the under-researched but emerging stream of athlete entrepreneurs with qualitative studies (Ratten, 2015; Ratten & Thaichon, 2020; Boyd, Harrison, & McInerney, 2021). This dissertation enhances the knowledge within the new path that separates athlete entrepreneurship from the more contextual phenomenon of sports entrepreneurship and contributes by defining athlete entrepreneurship as an own sub-stream of research. The studies within this dissertation show the specifics of former top athletes when it comes to career reorientation. Study 1 and 3 explain the entrepreneurial intention contributing with quantitative data, and study 2 explores the actual transition behavior qualitatively.

In the entrepreneurial context relation between personality and entrepreneurial intention and performance is well researched, already reaching the meta-analytical level (Zhou, Yang, & Zhang, 2019; Kerr, Kerr, & Xu, 2018; Zhao, Seibert, & Lumpkin, 2010). In contrast, in the context of professional sports, more specified research on personality traits is needed. The majority of prior quantitative research on personality traits of “sports people” examined sports students or individuals engaging in sport (e.g., Eagleton, McKelvie, & De Man, 2007), without

differentiation of pursuing the sport on a professional or recreational level. Table 5-1 highlights the particular samples of the three studies. Study 1 sets an empirical cornerstone explaining the personality traits of 67 top athletes competing on a high level. Furthermore, the more detailed examination between high-risk and low-risk sports indicates differences in the risk propensity of athletes. Also, other personality traits differ depending on the kind of sport. Study 1 draws conclusions about the attraction towards entrepreneurship based on the theoretical frame of the person-job fit theory (Kristof, 1996). Within the third study, data of 195 top athletes provide deep insights into the causal relation between the specific skill of resilience and entrepreneurial intention. Comparing the control group of 142 non-athletes strengthens the findings on athlete entrepreneurs' specifics.

This contribution to athlete entrepreneurship is enhanced by explorative researching causes and consequences around the career transition within the second study. Interviewing eleven former and active top athletes about their personal experiences in career transition into entrepreneurship, further perspectives on athlete entrepreneurs as contextual factors and motivations were identified. The method of CCM enables to find commonalities behind the very individual experiences of athlete entrepreneurs.

Table 5-1 Size and groups of the samples and methodological approach within the studies

| Study | Method | Sample size | Groups |
|-------|--------------|-------------|-------------------------------------------|
| 1 | Quantitative | 67 (31/36) | Top athletes (high-risk / low-risk sport) |
| | | 43 | Non-athletes |
| 2 | Qualitative | 11 | Athlete entrepreneurs |
| 3 | Quantitative | 195 | Top athletes |
| | | 142 | Non-athletes |

5.2 Entrepreneurial career transition

As repeatedly mentioned in this dissertation, athletes face the unavoidable need to reorient and pursue a second career after being an athlete. Career transition is often considered distressing and associated with difficulties (Park, Lavalley, & Tod, 2013). For example, feeling lost and helpless due to losing the role and, therefore, the identity as an athlete is a confirmed phenomenon after retiring as a professional athlete (Lally, 2007; Lavalley & Robinson, 2007). Transition-related stress can be caused by internal and external factors (Pummell, Harwood,

& Lavalley, 2008) and so can be the resources. Park, Lavalley, and Tod (2013) highlighted four categories of athletes' resources during career transition: coping strategies, planning before retirement, psychosocial support, and programs offering support. Within this dissertation, all these resources are addressed. The research focus is on planning and coping strategies, but the results also enable conclusions about further support needed. With the research on resources during the transition process of athletes, this dissertation contributes to the research on sports psychology.

Starting with the aspect of planning, Saks and Ashforth (2002) found a better person-job fit for graduates that did career planning, like setting career goals and strategies in advance of the career transition. Planning a career transition towards entrepreneurship starts earlier. It begins by considering entrepreneurship as a career option. Study 1 of this dissertation concludes the good person-job fit between athletes pursuing an entrepreneurial career based on their personality traits and recommends that entrepreneurship is a recommendable career option. These insights give valuable value-added for the initial career planning of athletes. Therefore, this dissertation contributes not only on a theoretical basis to entrepreneurial career transition it also has a significant practical impact on athletes.

Different coping strategies of the interviewed athletes were identified within the second study. To contribute to the entrepreneurial career transition literature with a more detailed understanding of the interdependencies between coping and the entrepreneurial intention of athletes, the coping strategy of resilience is investigated deeper in the third study of this dissertation. Both studies also found the trait of confidence as influencing the career transition. On the one hand, confidence can be considered a coping strategy, but on the other hand, confidence might lead to fearlessness and hybris. The trade-off between confidence and over-confidence leads to the resource programs and support of Park, Lavalley, and Tod (2013) that will be discussed in chapter 5.3.

The two most prominent models explaining entrepreneurial intention are the TPB and Shapero's model of the entrepreneurial event (Ng et al., 201). Shapero argues that the perceptions of personal desirability, feasibility, and the propensity to act best explain entrepreneurial intentions (Shapero & Sokol, 1982). The predictive power of both models is found equal (Krueger et al., 2000), but as the dominant theoretical framework on entrepreneurial intention (Ng et al., 2021), the high numbers of existing research enables to applicate, compare, and validate the model over different disciplines and contexts. Within the TPB, the entrepreneurial intention is conceptualized as the immediate antecedent predicting the entrepreneurial behavior (Ajzen, 1991). As pictured in figure 1-1, this dissertation as a whole considers the complete TPB, including the actual entrepreneurial behavior. The investigation of the actual transition behavior enriches the entrepreneurship research about

the TPB because, except for a few exemptions, research focuses on explaining the entrepreneurial intention (Schlaegel & Koenig, 2014).

The CSM by Lent and Brown (2013) is a popular approach explaining the career transition into entrepreneurship under the lens of the SCT. Zikic and Saks (2009) research the job search intention by integrating the TPB in the context of the SCT. The authors relate cognitive and personal factors of the SCT to perceived behavioral control and personal attitude and environmental factors to the subjective norm, allowing the different perspectives of the SCT within the TPB. Lim, Lent, and Penn (2016) suggest for future research that the predictive utility of the CSM should be testing alternative model paths derived from further models, for example, the TPB. Only a few studies were found in the most recent research, combining intention-based models with the social cognitive approach in entrepreneurship (e.g., Munir et al., in press; Yazdanpanah, Khosravipour, & Azadi, 2020). The explorative identification of causes driving athletes towards entrepreneurship within the second study of this dissertation is based on the SCT. Integrating the study in the interdependencies of the TPB, the lens of the SCT was added to the intention-based perspective on career transition. Therefore, this dissertation contributes to the entrepreneurship literature in general by the revised application of the combination of intention-based and social cognitive theories.

Furthermore, no research combining both approaches can be found within the specific context of sports, regardless of the perspective on sports entrepreneurship. As both personal and environmental factors are essential for the career transition (Park, Lavalley, & Tod, 2013), the added value of integrating the social-cognitive approach in the TPB is self-evident. Understanding the drivers of entrepreneurial intentions is vital because doing so encourages researchers to consider and connect different factors influencing entrepreneurial behavior, such as psychological and economic factors (Goethner et al., 2012). Therefore, this dissertation contributes to examining the entrepreneurial career transition to the entrepreneurship literature in general and the subordinated specific research stream of sports entrepreneurship.

An extension to the SCT by Pérez-López, González-López, and Rodríguez-Ariza (2019) adds the variable coping behaviors as a relevant influencing factor on the level of decidedness to perform an entrepreneurial career. Coping is a necessary skill for athletes permanently facing failure, criticism, pressure, and expectations by others (Ceccarelli et al., 2019). Study 2 confirms the positive relation between coping and entrepreneurial behavior. Study 3 researches the influence of the specific coping strategy of resilience on entrepreneurial intention. In addition, this dissertation points out the applicability of the model by Pérez-López, González-López, and Rodríguez-Ariza (2019), explaining the decidedness for the group of top

athletes. By taking the model one step further to the actual career transition, this dissertation also contributes by showing the influence of coping on actual entrepreneurial behavior.

The confirmation of existing theories on career transition and the identification of important influencing factors has not only theoretical relevance. The practical contribution to athletes' career transition is extensive. The awareness of the matching personalities might motivate athletes to consider entrepreneurship as a possible second career path. Facing transition-related stress (Pummell, Harwood, & Lavalley, 2008) and severe mental issues like identity loss (Lally, 2007), experiences with coping skills might help athletes to overcome these challenges during their transition better. Especially athletes' high level of resilience was identified and positively linked to entrepreneurial intention and behavior. It has to be mentioned that these findings are not exclusive to the career transition into entrepreneurship but affect every transition out of the career as a top athlete. Furthermore, the findings identified in athletes' career transition can be transferred to other professions as well as career transition in general. Therefore, this dissertation's practical scope and contribution to the athletes' career transition have to be highlighted.

5.3 Support programs and entrepreneurship education

Kuckertz (2021) presented the benefits of entrepreneurial education on different levels: positive effects on societies by initiating innovation and generating employment (OECD, 2017); positive effects on education institutions by integrating them into the entrepreneurial ecosystem (Wright et al., 2017). Besides higher education institutions, specific support programs of associations or even private sector support and education measures are expected to deliver the aforementioned positive effects. For this dissertation, the positive effects on the educated individuals are in focus. Strengthened competencies and an aroused entrepreneurial spirit are valuable for an entrepreneurial career (Kuckertz, 2021) or being a sports coach (Jones et al., 2017), as well as working for corporates driving innovation (Charney & Libecap, 2000).

Individuals whose first career ends foreseeable would have a period to prepare for the career change. This opportunity to consider might also be used for active preparation, such as acquiring skills and experience through targeted training and networking. Moustakas and Kalina (2021) identified reservations against entrepreneurship of top athletes that might be a result of limited knowledge and awareness about entrepreneurship, underlining a lack in the current dual-career activities for athletes. That contradicts study 3 findings of a higher entrepreneurial intention for athletes than for non-athletes. Nevertheless, this dissertation supports the arguments of a possible lack of knowledge about entrepreneurship and only

selected availability of dual-career programs that have to be addressed. This dissertation enables researchers and policymakers to identify potential entrepreneurs, better understand their preconditions, and support them with targeted measures (Ng et al., 2021). Raising awareness of entrepreneurship as a possible second career option, education and training of necessary skills, and providing networks are different aspects of support.

After discussing the resources of pre-retirement planning and coping strategies in section 5.2, this section discusses the inferences about support program involvement and psychosocial support. Programs preparing athletes for the career transition most often aim to develop educational, social, and work-related transferrable skills (Wylleman, Alfermann, & Lavallee, 2004). Multidimensionality is a key requirement of which one crucial aspect is the psychosocial support (Wylleman, Alfermann, & Lavallee, 2004) given by family, friends, teammates, coaches, or mentors. Specific entrepreneurship programs should be designed to prepare athletes for an entrepreneurial career. For athletes, Kenny (2015, p. 179) outlined relevant components worth considering “the target audience, the context or environment, pedagogy, content, objectives, and the assessment and evaluation.”

Strong internal motivation can be achieved if education is built on personal interest and surrounding environments (Taataila, 2010). Entrepreneurship might not be every athletes’ interest. However, based on the person-job fit theory and the results found within this dissertation, it can be concluded that entrepreneurship is an attractive career choice for many of them. The identification of causes towards entrepreneurship within study 2 contributes to the existing research on athletes’ entrepreneurship education as relevant objectives of the programs can be specified. Athletes already have specific skills and traits needed for entrepreneurship that can be transferred into the context of a new career. Concrete, the capability to accept failure, develop different coping strategies, and react resiliently was highlighted in studies 2 and 3. Other skills and traits are essential for athletes, such as the awareness of a possible over-confidence that might lead to taking too much of a risk, as explained in study 3. Kenny (2015) distinguished between objective as goals set within the program and outcomes as actions following the program. The identified outcome expectations of entrepreneurship in advance of the career transition also enable a program planning that makes programs suitable and may lead to desired outcomes. The target audiences’ needs of flexibility in time and entry to education have to be considered when planning a program (Kenny, 2015). Therefore, the organization of the programs has to fit the demanding schedule of still active athletes.

The findings contribute not exclusively to the entrepreneurship education of top athletes. The drivers towards entrepreneurship (identified within study 2) can be considered a starting point for future research on targeted entrepreneurship education programs for other groups with

specific experiences (e.g., professional musicians). The influence of resilience on entrepreneurial intention, whether for top athletes or non-athletes, points out the importance of resilience training within educational programs. Existing content and goals of education can be challenged in consideration of the dissertations' results.

Furthermore, athletes can add valuable content to education by sharing experiences and expertise on aspects such as teamwork, failure, or coping. This value-add of athletes contributes to the positive effects of entrepreneurship education, mentioned at the beginning of this chapter. Therefore, it is concluded that education programs and society also benefit from integrating athletes.

5.4 Limitations

Limitations of the studies included are pointed out in the respective chapters. Nevertheless, answering the overarching research question also includes limitations.

As mentioned in section 5.2, this dissertation considers the whole TPB. Adding the variable of entrepreneurial behavior enriches existing research but is not without limitations. As figure 1-1 shows, influencing factors on entrepreneurial intention is researched in study 1 and 3, whereas study 2 researches the influencing factors on the actual behavior. So the iterative procedure of this dissertation went from explanatory research on the entrepreneurial intention over an explorative investigation of the actual entrepreneurial behavior to a deep causal investigation of influencing factors on the intention. At first sight, that causal research might look like a step back. In contrast, the focus on intention enables a sufficient sample size to gain valid results about athletes' entrepreneurial intention. Nevertheless, it has to be mentioned that the confirmation of athletes' entrepreneurial intention as the best predictor for entrepreneurial behavior can only be drawn theoretically, pointing out the potential for future research.

Furthermore, the model drawn in figure 1-1 does not claim completeness. The author of this dissertation is aware that the variables chosen are a selection of influencing factors on entrepreneurial intention, not considering mediating or moderating variables. In this dissertation, the contextual factor of experiences as a professional athlete and the early stage of research on athlete entrepreneurship justify the selection.

Study 3 was introduced as a causal approach. Based on Cook and Campbell (1979), causality has three conditions: (1) the existence of covariance between the independent and dependent variables, (2) temporal precedence of the variables, and (3) the absence of competing explanations for the relation. As a cross-sectional study is not able to depict temporal precedence, statistical causality is not given within study 3. According to Weiber and Sarstedt (2021), relations can be interpreted as causal with a given statistical dependence between the

variables considered and sufficient theoretical or logical reasoning. The identified correlations alone do not justify a conclusion on causality. However, as the hypotheses are based on theoretical evidence, both conditions established by Weiber and Sarstedt (2021) are fulfilled within study 3. Therefore, the term causality is used within this dissertation.

Also, the limitation on the country of Germany has to be mentioned. This limitation was chosen on purpose due to different prevailing circumstances, for example, education, state support, or social acceptance of professional athletes between countries. In addition to that, the author aims to gain insights independently from that influencing factors. Though, the findings of that dissertation might not be confirmed for other countries.

Besides researching the model in other countries, future research should prove the findings in different contexts, such as individuals leaving the army or former professional musicians, to gain insight into career transition. Moreover, additional influencing factors, mediators, and moderators on the athletes' entrepreneurial intention should be researched.

5.5 Concluding remarks

Of course, not every person needing to build a second career has strong entrepreneurial intentions and is willing to accept the risks inherent in entrepreneurship. However, the significant number of athletes affected by the phenomenon of a first-career ending, the higher entrepreneurial intention for athletes compared to non-athletes (see study 3), and the tremendous economic potential of these second-career entrepreneurs merits investigation.

It has to be mentioned that the education during the career as a professional athlete differs between countries (Vaeyens et al., 2009). The data of this dissertation were collected in Germany, and therefore, speaking for this country, disadvantages in education and work experience for professional athletes can be mentioned. Research is needed to overcome possible disadvantages and convert the resources into advantages.

By highlighting commonalities between the careers of athletes and entrepreneurs, the athlete might identify entrepreneurship as a previous undetected but viable career option. On the other hand, companies might be aware of the great potential of athletes as employees with an entrepreneurial mindset. Research also is a substantial base to call the attention of policy and associations on the support needs of athletes when it comes to career transition. Concluding, this dissertation builds a cornerstone for future research on athlete entrepreneurship and concurrently underlines practical implications.

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Appendix 1: Co-Author statements



KO-AUTORENERKLÄRUNG *DECLARATION OF CO-AUTHORSHIP* (Für kumulative Dissertationen)

Name des Kandidaten:
(Name of the candidate)

Kathrin Steinbrink

Titel des Artikels (Title of the article):

Top athletes' psychological characteristics and their potential for entrepreneurship

- nicht eingereicht (*not submitted*)
- eingereicht bei (*submitted to*):
- Zur Veröffentlichung angenommen oder veröffentlicht in (*accepted for publication or published in*):

International Entrepreneurship and Management Journal

Arbeitsanteil des Kandidaten an vorgenanntem Artikel *Quantification of candidates contribution to the article (overall)*:

- hat zur Arbeit beigetragen/*has contributed to the work (<1/3)*
- hat wesentlich zur Arbeit beigetragen/*has made a substantial contribution (1/3 to 2/3)*
- hat einen Großteil der Arbeit allein erledigt/*did the majority of the work independently (>2/3)*

Ko-Autoren *Co-authors* (Name und Kontaktdaten/*full name; contact*):

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| 2. | Univ.-Prof. Dr. Elisabeth S. C. Berger, elisabeth.berger@jku.at |
| 3. | |
| 4. | |

Hiermit bestätige ich die Richtigkeit des oben beschriebenen Arbeitsanteils des Kandidaten.
I hereby confirm the candidate's contribution as quantified above.

Hohenheim, 10.1.22

Ort, Datum *Place, Date*

Unterschrift Ko-Autor *Signature (Co-Author)*



KO-AUTORENERKLÄRUNG DECLARATION OF CO-AUTHORSHIP
(Für kumulative Dissertationen)

Name des Kandidaten:
(Name of the candidate)

Kathrin Steinbrink

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- hat wesentlich zur Arbeit beigetragen/*has made a substantial contribution (1/3 to 2/3)*
- hat einen Großteil der Arbeit allein erledigt/*did the majority of the work independently (>2/3)*

Ko-Autoren *Co-authors (Name und Kontaktdaten/full name; contact):*

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| 3. | |
| 4. | |

Hiermit bestätige ich die Richtigkeit des oben beschriebenen Arbeitsanteils des Kandidaten.
I hereby confirm the candidate's contribution as quantified above.

Linz, den 09. Februar 2022

Ort, Datum *Place, Date*

Unterschrift Ko-Autor *Signature (Co-Author)*



KO-AUTORENERKLÄRUNG DECLARATION OF CO-AUTHORSHIP
(Für kumulative Dissertationen)

Name des Kandidaten:
(Name of the candidate)

Kathrin Steinbrink

Titel des Artikels (Title of the article):

The entrepreneurial intention of top athletes—does resilience lead the way?

- nicht eingereicht (not submitted)
- eingereicht bei (submitted to):
- Zur Veröffentlichung angenommen oder veröffentlicht in (accepted for publication or published in):

International Entrepreneurship and Management Journal

Arbeitsanteil des Kandidaten an vorgenanntem Artikel Quantification of candidates contribution to the article (overall):

- hat zur Arbeit beigetragen/has contributed to the work (<1/3)
- hat wesentlich zur Arbeit beigetragen/has made a substantial contribution (1/3 to 2/3)
- hat einen Großteil der Arbeit allein erledigt/did the majority of the work independently (>2/3)

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Hiermit bestätige ich die Richtigkeit des oben beschriebenen Arbeitsanteils des Kandidaten.
I hereby confirm the candidate's contribution as quantified above.

Landshut, 10.02.2022

Ort, Datum Place, Date

C. Ströhle

Unterschrift Ko-Autor Signature (Co-Author)

Appendix 2: Declaration in lieu of an oath on independent work

Anlage 3

Eidesstattliche Versicherung über die eigenständig erbrachte Leistung

gemäß § 18 Absatz 3 Satz 5 der Promotionsordnung der Universität Hohenheim für die Fakultäten Agrar-, Natur- sowie Wirtschafts- und Sozialwissenschaften

1. Bei der eingereichten Dissertation zum Thema

Next match entrepreneurship Three studies exploring the career transition from professional athletes to entrepreneurs

.....

handelt es sich um meine eigenständig erbrachte Leistung.

2. Ich habe nur die angegebenen Quellen und Hilfsmittel benutzt und mich keiner unzulässigen Hilfe Dritter bedient. Insbesondere habe ich wörtlich oder sinngemäß aus anderen Werken übernommene Inhalte als solche kenntlich gemacht.

3. Ich habe nicht die Hilfe einer kommerziellen Promotionsvermittlung oder -beratung in Anspruch genommen.

4. Die Bedeutung der eidesstattlichen Versicherung und der strafrechtlichen Folgen einer unrichtigen oder unvollständigen eidesstattlichen Versicherung sind mir bekannt.

Die Richtigkeit der vorstehenden Erklärung bestätige ich. Ich versichere an Eides Statt, dass ich nach bestem Wissen die reine Wahrheit erklärt und nichts verschwiegen habe.

Stuttgart, 12.04.22

Ort, Datum



Unterschrift

Appendix 3: Curriculum vitae

