School-Sport Balance in University Student-Athletes

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General Abstract

The conciliation of school and sports is considered to be a central challenge in the lives of most university student-athletes. This question has been examined to some extent in the literature, however, many gaps remain to better understand this question. The purpose of this doctoral dissertation was to address major research caveats in order to deepen our understanding of the perception of balance between school and sport among undergraduate student-athletes, a notion that is called *school-sport balance* in this dissertation. More specifically, this doctoral dissertation aims to: (1) provide a new conceptual model of school-sport balance among university student-athletes, (2) develop and conduct a preliminary validation of a questionnaire to assess the construct of school-sport balance, and (3) test a mediation model of school-sport balance with potential antecedents and outcomes. Two empirical articles with two independent samples composed this dissertation. The aim of Article 1 was to develop and conduct a preliminary validation on a new self-report questionnaire to assess the perception of balance between school and sport roles among university student-athletes, namely the School-Sport Balance Scale (SSBS). The preliminary validation of the SSBS is reported in terms of content validity, factorial validity, internal consistency, and a nomological network of developmental correlates consisting of personality, motivation, mental health, wellbeing, as well as sport and school adjustment. The sample was composed of 105 undergraduate university student-athletes, aged between 17 and 25 years old. The results from confirmatory factor analyses (CFA) reported that SSBS has a four-factor structure yielding four subscales: (1) school-to-sport conflict; (2) sport-to-school conflict; (3) school-to-sport facilitation; and (4) sport-to-school facilitation. The internal consistency of the four subscales was also good. Furthermore, as anticipated, sport-to-school and school-to-sport conflicts were mostly related with detrimental correlates, whereas

sport-to-school and school-to-sport facilitation were generally associated with beneficial correlates. The aim of Article 2 was to further build on and expand on some of the correlates of Article 1 and investigate potential antecedents and consequences of school-sport balance. More particularly, four serial mediation models were tested, in which autonomous and controlled motivation (school and sport) would lead to school-sport balance (school-sport conflict, and sport-school conflict, school-sport facilitation, sport-school facilitation), which in turn may impact stress (school and sport) and then impact mental health (depression and anxiety symptoms). The sample consisted of a total of 193 undergraduate university student-athletes, aged between 17 and 25 years old. The findings from Article 2 indicated that school-sport balance was not a significant mediator of the relationships between motivation, stress, and mental health. Results however indicated that motivation could be an antecedent of school-sport balance. In addition, findings revealed that sport-school conflict was linked with more sport stress, whereas school-sport conflict was related to more symptoms of anxiety and depression. Yet, when considering school motivation and school stress, school-sport balance was not related to stress or mental health issues. Overall, based on the results of the present dissertation, school-sport balance is an intricate construct to outline and understand. This dissertation, however, provides an important springboard to better understand the role of school-sport balance in the lives of university student-athletes. Research contributions and future research directions are discussed.

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Content of Thesis and Statement of Authors

The present dissertation is manuscript-based. It is composed of a general introduction, two manuscripts in article format, and a general discussion. The first article is entitled *A Preliminary Validation of the School-Sport Balance Scale among Canadian University Student-Athletes.* The second article is entitled *School-Sport Balance among University Student-Athletes: Identifying Potential Motivational Antecedents and Mental Health Outcomes.* Both manuscripts will be submitted for publication following the thesis defense.

The two manuscripts included in this dissertation were prepared in collaboration with my thesis supervisor, Dr. Dave Miranda. The author of the present dissertation is the first author and the thesis supervisor contributed as second author in both of these manuscripts. As author of this doctoral dissertation, I developed and conceptualized both studies, reviewed the literature, prepared the ethics applications, collected, managed and cleaned the data, conducted all analyses, and wrote every part of this dissertation. My thesis supervisor, Dr. Dave Miranda, offered guidance and feedback during each step of this dissertation.

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CHAPTER 1: General Introduction

University student-athletes are constantly confronted with substantial expectations and pressures to excel in their sport and deliver high-level performances (Cosh & Tully, 2015). In doing so, they invest a significant amount of time and energy in their sport, which often entails doing sacrifices in other important spheres of their life (Wylleman & Lavallee, 2004). Over the past years, the scientific literature has given much attention to better understanding student-athletes within a holistic perspective, acknowledging that they are not only sport performers, but also individuals who must strive to balance their athletic, psychological, social, and academic realities (Stambulova & Wylleman 2015; Wylleman & Lavallee, 2004; Wylleman et al., 2013). Additionally, few athletes will make it to an elite level or will be able to attain a long-term career in sports, making it imperative for most athletes to succeed in their post-secondary education (Wylleman & Rosier, 2016). Therefore, a central challenge that athletes encounter is the need to balance the roles and commitments of being an athlete with the role of being a university student (Stambulova & Wylleman, 2015; Wylleman & Lavallee, 2004). Given that time is a finite resource, how do university student-athletes perceive their balance among multiple school and sport demands? The question has received some preliminary consideration in the literature, but many gaps remain to better understand this question.

Limitations in the current literature and major contributions of this dissertation

The present doctoral dissertation will attempt to address three major caveats that exist in the current literature when investigating balance among multiple life domains in university student-athletes. This dissertation will therefore allow us to expand our understanding of the perception of balance between school and sport among undergraduate student-athletes, which is a concept that I named *school-sport balance*.

First, one important criticism pertains to the lack of consensus in how the concept of balance is defined (Kalliath & Brough, 2008). Although the question of balance has been extensively investigated throughout the last decades, it has often been conceptualized differently across different domains of psychology. The absence of agreement in the conceptualization of balance among multiple domains makes the understanding of this phenomenon ambiguous. This results in theoretical and methodological issues. The *first objective* of this dissertation was to provide a synthesis of pertinent subdisciplines in psychology that have studied balance among life domains. This allowed to integrate pertinent conceptual elements from different domains to develop a more comprehensive view of what school-sport balance means in university student-athletes. In the general introduction of this dissertation (chapter 1), I will present three main perspectives that have been used in the literature to study balance among life domains and that will be useful in conceptualizing my school-sport balance perspective. I will then suggest a conceptual framework of school-sport balance.

Second, in the current literature there seems to be a lack of validated measures to assess university student-athletes' perception of balance between school and sport. The measures that have been developed thus far have not been validated to assess school-sport balance among university student-athletes. Therefore, the *second objective* of this dissertation was to develop and validate a self-report scale to measure the perception of balance between school and sport roles among university student-athletes. In study 1 (chapter 2), we introduce a new self-report scale designed specifically to measure the perception of school-sport balance among university student-athletes: The School-Sport Balance Scale (SSBS). We conducted the preliminary validation of the SSBS in terms of content validity, factorial validity, internal consistency, and a nomological network of developmental correlates.

Third, because school-sport balance is a relatively new concept and the specific conceptualization that we give to school-sport balance is in its infancy, the antecedents and outcomes of school-sport balance are still unclear. Hence, the *third and final objective* of this dissertation was to examine potential antecedents and consequences of school-sport balance among university student-athletes. In study 2 (chapter 3), we aimed to further deepen our understanding of the notion of school-sport balance by proposing possible antecedents and consequences. We attempted to better understand school-sport balance as a mediating process which could have an impact on stress and in turn on student-athletes' mental health. Specifically, in study 2, we examined a serial mediation process in which motivation (autonomous or controlled) will predict mental health through two successive mediators, first school-sport balance and then stress, respectively. To summarize, my doctoral dissertation has three major contributions that will address both theoretical and methodological limitations in the current literature. First, I will provide a new conceptual model of school-sport balance among university student-athletes (*first objective*). Second, I will develop and validate a questionnaire to assess the construct of school-sport balance *(second objective)*. Thirdly, I will test a mediation model of school-sport balance with potential antecedents and outcomes (*third objective)*.

In this general introduction, I will first discuss the importance of examining school-sport balance during the developmental period of emerging adulthood, followed by contextualizing mental health among university student-athletes as it represents a plausible consequence associated with reconciling school and sport demands. Next, I will present an overview of how balance among life domains has been defined and conceptualized thus far throughout different disciplines of psychology. I will then propose a comprehensive framework of school and sport balance among university student-athletes. Following this, I will suggest possible antecedents

and consequences of school-sport balance. Finally, I will present the organization of the remainder of the dissertation.

Student-Athletes within the Life Period of Emerging Adulthood

Most university student-athletes are within a developmental stage defined as emerging adulthood (Arnett, 2000, 2004, 2015). This period occurs between adolescence and young adulthood, spanning approximately from 18 to 25 years of age. Emerging adulthood has been distinguished as a stage of development that is recognized to be separate from adolescence and adulthood in industrialized societies (Arnett, 2000). Emerging adulthood is also a time where individuals no longer consider themselves as adolescents but will report that they have not yet reached adulthood (Arnett, 2000). The most important developmental milestone pertaining to emerging adulthood includes identity exploration in which they attempt to accept responsibility for their own actions, make independent decisions, and become more autonomous in the decisions they make for their lives (Arnett, 2000). As emerging adults traverse cognitive, social, and emotional changes, it is described as a stressful period (Arnett, 2000, 2004). This period is particularly salient because emerging adults make important decisions and choices that can impact their entire adult life (Zarrett & Eccles, 2006). Because of all these developmental changes, emerging adulthood can be a stressful time for many university students (Arnett, 2000).

Emerging adulthood might be even more challenging for those who must also perform in competitive sports. For most students-athletes, it is the first time that they no longer live with their parents or rely on them for support (Wylleman et al., 2013). While experiencing the same normative developmental tasks as their non-athlete peers, university student-athletes must also negotiate their increased academic and sport demands. It is suggested that striking balance between different life domains is a particularly challenging task for university student-athletes

(Britse & Varga Karlsson, 2017). Moreover, it has been proposed that student-athletes may even face more complex demands and stressors than their non-athlete peers including that they are constantly reconciling their student and athlete roles (Wilson & Pritchard, 2005). Thus, the numerous developmental changes encountered during emerging adulthood coupled with constantly needing to make trade-offs between their school and sport tasks, makes this period of life particularly intense, demanding, and stressful for student-athletes.

Mental Health and University Student-Athletes

It is reported that one in five Canadians will be affected by mental illness each year (Mental Health Commission of Canada, 2013). The majority of mental illnesses will develop between the ages of 15 and 24 years (Kessler et al., 2005; Pearson et al., 2013), which makes emerging adults a vulnerable population for the incidence of mental illness. In fact, mental health has become one of the leading concerns for Canadian university students over the past decade (American College Health Association [ACHA], 2016). The results from a recent national survey (ACHA, 2016) conducted with Ontario undergraduate students indicated that most students felt overwhelmed by all they had to do (89%) and many felt anxious (65%) as well as depressed to the point that they had difficulty functioning (46%). These statistics show the growing concern of mental illness particularly among the university student population. Moreover, over the past years, there seems to be an increase in the number of undergraduate students who experience mental health problems and stress (ACHA, 2016; Twenge et al., 2010, 2019).

It is only recently that more attention has been dedicated to athlete's mental health (Uphill, et al., 2016). In the past, this question was rarely examined because it was assumed that few athletes showed mental health disorders (Lebrun & Collins, 2017; Van Slingerland et al., 2018). However, recent studies have reported that student-athletes who attend post-secondary education

also experience mental health challenges (Neal et al., 2013; Reardon & Factor, 2010; Rice et al., 2016). According to Humphrey and colleagues (2013), athletes in the NCAA encountered high levels of stress that were particularly tied with academic difficulties, athletic demands, time, interpersonal relationships, and finances, which were reported to then have a negative impact on their overall health, as well as their athletic and academic performances. Researchers have even identified that student-athletes seem to report the same level of psychological distress than non-athlete university students. For instance, in the USA, a recent empirical study indicated that 23,7% of NCAA student-athletes reported clinically significant symptoms of depression (Wolanin et al., 2016). Another study measuring the levels of psychological distress (i.e., depression and anxiety) among Canadian university student-athletes concluded that 20% of the sample experienced severe mental illness (Sullivan et al., 2019). In contrast, a recent systematic review of the literature looking at college student-athletes and depression indicated that athletes seem to report fewer depressive symptoms than their non-athlete peers (Armstrong et al., 2015). Nevertheless, it is suggested that student-athletes are less likely to ask for help than their non-athlete peers, which can increase the risk of distress (Armstrong et al., 2015). Researchers have also identfied many barriers to mental health treatment within the sport context, which could make student-athletes at even greater risk for mental illness aggravation (Gulliver et al., 2012).

In addition, a possible factor that might make student-athletes more vulnerable than the non-athlete population is that mental health can still be a taboo within the sport culture (Gulliver et al., 2012; Sudano et al., 2017). Traditionally, common phrases, such as "'*no pain, no gain" or "play through the pain"* – were voiced to athletes, giving the message to athletes that they should never show any weakness. As a result, student-athletes may not seek help to cope with their mental health challenges because of fear that they might be perceived as weak. For

instance, in a qualitative study assessing the barriers and facilitators to mental health seeking in young elite athletes aged between 16 and 23 years, it was reported that over 40% of the barriers identified by study participants were associated with stigmatization and the embarrassment they might feel if they sought help (Gulliver et al., 2012). Moreover, the lack of specialized support provided to student-athletes might discourage them to consult mental health specialists for fear that professionals will not understand their unique reality. As recently discussed by Van Slingerland and colleagues (2019), in the Canadian context, psychiatrists, psychologists and psychotherapist who specialize in sport in Canada are few, which presents a major gap in the mental health care services offered to student-athletes. It is therefore essential to continue to better understand the mental health challenges among this specific population. In sum, university student-athletes have many academic and athletic demands that they are required to conciliate, which can have an important impact on their mental health.

A Theoretical Background to Understand School-Sport Balance

What is Balance?

Over the past 30 years, research on balance among multiple life domains has grown in popularity in the scientific literature. The "balance" metaphor is commonly used but is a complex construct to define (Kalliath & Brough, 2008). According to the APA Dictionary of Psychology, balance can be defined as "a harmonious relationship or equilibrium of opposing forces or contrasting elements" (VandenBos, 2007, p.99). Finding balance may also entail that life domains should facilitate each other rather than conflict with each other. However, it does not necessarily signify that student-athletes must invest equal amounts of time or resources into their athletic and student roles in order to reach optimal balance (Aquilina, 2013). The notion of balance is difficult to define because numerous terms and theoretical frameworks have been used

to understand balance between life domains making it challenging to tease them apart. For instance, the perception of balance has been studied in organizational psychology (e.g., work-family conflict, work-family facilitation), sport psychology (e.g., dual career, dual roles, student-athletes identity), and educational psychology (e.g., goal conflict, study-leisure motivational interferences). Balance has thus received much consideration in the scientific community. However, scholars have made little progress in integrating the various conceptualizations of balance. Examining these complementary approaches is nonetheless essential to develop a comprehensive and well-informed view of school-sport balance among student-athletes.

This section will provide an overview of pertinent domains in psychology that have studied balance among multiple life domains. This will allow to integrate pertinent parts of different domains to develop a comprehensive view of what school-sport balance means among university student-athletes. While school-sport balance is a relatively new concept, it stems from known principles in the literature, which can be applied to school-sport balance. Table 1 presents a summary of the most salient theories of balance, as well as sub-theories, definitions, and their relationships to my school-sport balance construct. In this next section, I will: (1) present three main perspectives that have been used in the literature to study balance among life domains and that will be useful in conceptualizing my school-sport balance perspective, (2) discuss relevant questionnaires that have measured the interaction of multiple domains in university students, (3) suggest a unifying definition, main assumptions, and antecedents and consequences of school-sport balance among student-athletes (4), and finally present the focus of the present dissertation.

The Organizational Psychology Perspective: Role Theory & Work-Family Interface

The phenomenon of finding balance among life contexts, has been most widely studied in the domain of organizational psychology (Allen et al., 2000; Eby et al., 2005; Greenhaus &

Allen, 2011). Scholars in this area of psychology have traditionally studied conflicting work with family obligations (and vice-versa) in adults, often termed as work-family interface (e.g., Frone, 2003). Although it is the work-family interface in adults that has received the most consideration in organizational psychology, some studies have focused on the work-to-study interface (e.g., Butler, 2007; Cinamon, 2016; Creed et al., 2015; McNall & Michel, 2011, 2017; Nicklin et al., 2018; Owen et al., 2018; Park & Sprung, 2013) and the family-to-university interface (e.g., Meeuwisse et al., 2011, 2014) among university students.

Role Theory. The theoretical framework that has been proven to be most useful in conceptualizing the interaction between multiple domains in organizational psychology is role theory (Greenhaus & Beutell, 1985; Kahn et al., 1964). Role theory postulates that social roles (e.g., work, family, leisure, etc.) are significant in the lives of individuals and that each social role entails responsibilities (Kahn et al., 1964). These roles can be grouped into two broad categories: (i) work roles and (ii) nonwork roles (e.g., family, religion, community, leisure, student; Frone, 2003). Given that most individuals occupy several social roles, role interference (i.e., incompatible interaction between two competing life roles) is therefore a phenomenon that can arise from having more than one social role at a time (Kahn et al., 1964). Accordingly, two alternative perspectives have been used when studying multiple roles, which are: (i) the scarcity perspective and (ii) the expansion-enhancement perspective (Aryee et al., 2005). On the one hand, the scarcity perspective stipulates that an individual has a limited quantity of psychological and physical resources (Greenhaus & Beutell, 1985; Greenhaus & Powell, 2003). Therefore, by managing their multiple roles (e.g., school, sport, family, work, etc.), they will inevitably allocate more resources to one role and fewer resources to another role, which in turn can lead to poorer functioning (Greenhaus & Beutell, 1985; Greenhaus & Powell, 2003). On the other hand,

according to the expansion-enhancement perspective, resources are not limited but expandable and participating in multiple roles produces positive gains that may outweigh the costs related with multiple roles (Greenhaus & Powell, 2006; Marks, 1977; Sieber, 1974). Overall, work-family scholars have suggested two broad dimensions to study the work-family interface. They have also developed two dimensions to integrate both scarcity and expansion-enhancement perspectives: (1) work-family conflict; and (2) work-family facilitation. These specific terms are defined below.

Work-Family Interface: Work-Family Conflict and Work-Family Facilitation. Greenhaus and Beutell (1985) were the first to refer to work-family conflict. They initially defined work-family conflict as "a form of inter-role conflict in which the role pressures from the work and non-work domains are mutually incompatible so that participation in one role (work) is made more difficult by virtue of participation in another role (family) and vice-versa which means that participation in the work (family) role is therefore more difficult by virtue of participation in the family (work) role" (Greenhaus & Beutell, 1985, p. 77). This perspective portrays that individuals embrace various roles and as they have a limited amount of resources, such as energy and time, they must make trade-offs (Greenhaus & Beutell, 1985). Given that the amount of resources is static, the involvement in multiple roles leads to allocating more resources to one role than the others (Greenhaus & Powell, 2003). This means that individual's efficiency will therefore be reduced in some roles (Greenhaus et al., 2006), and in turn, generate conflict between both domains (Karatepe & Bekteshi, 2008). Furthermore, researchers originally conceptualized work-family conflict as having only one direction of influence (work to family conflict), but over the years they expended their understanding of work-family conflict and suggested that it is probably a bidirectional phenomenon (Kalliath et al., 2012). Work-family

conflict is therefore depicted as two dimensions, work-to-family and family-to-work (Fone, 2003). With this in mind, Netemeyer and colleagues (1996, p.401) refer to work-family conflict (WFC) as "a form of interrole conflict in which the general of, time devoted to, and strain created by the job interfere with performing family-related responsibilities". Family-work conflict (FCW) is, in contrast, "a form of inter-role conflict in which the general demands of, time devoted to, and strain created by the family interfere with performing work-related responsibilities" (Netemeyer at al., 1996, p.401). These definitions of conflict are consistent with the scarcity perspective (Aryee et al., 2005).

A paradigm shift occurred in the conceptualization of work-family interface during the mid-2000s. Researchers no longer considered work-family interface to be uniquely negative but also theorized that the interaction between two domains may also have a positive influence on each other (Greenhaus & Powell, 2006). Role facilitation is consistent with the role expensive-enhancement theory (Marks, 1997; Sieber, 1974) and entails that work-family facilitation is " the extent to which participation at work (or home) is made easier by virtue of the experiences, skills, and opportunities gained or developed at home (or work)" (Frone, 2003, p.145). Therefore, engaging in multiple roles is associated with positive benefits that can create a synergistic effect of work and family roles which "outweigh the difficulties or costs associated with work and family roles" (Karatepe & Bekteshi, 2008, p. 517). Work-family facilitation is also bidirectional and therefore characterized through two dimensions, work-to-family facilitation (WFF) and family-to-work facilitation (FWF; Frone, 2003; Karatepe & Bekteshi, 2008).

Hence, the work-family interface is argued to have a negative and a positive side, that compose two distinct constructs, work-family conflict and work-family facilitation, which can be

experienced concurrently. Conflict and facilitation are both theorized to have bi-directional influences (Frone, 2003; Grzywacz & Butler, 2005; Karatepe & Bekteshi, 2008). To achieve a complete understanding of the work-family interface it is essential to include both dimensions (conflict and facilitation) and bidirectional influences (work-to-family and family-to-work; Carlson et al., 2006, 2009; Frone, 2003; Grzywacz & Butler, 2005; Karatepe & Bekteshi, 2008). Furthermore, Frone (2003) developed an extended model incorporating both conflict and facilitation aspects of work-family interface. The taxonomic structure encompasses both dimensions and directions of work-family interface (i.e., conflict and facilitation) and posits a two-way influence within a bidirectional relationship, namely from work to family and from family to work. Frone (2003) proposed that work-family balance could be organized into four types, namely : (1) family-to-work conflict; (2) work-to-family conflict; (3) family-to-work facilitation; and (4) work-to-family facilitation (e.g., Frone, 2003).

Strengths and Limitations of Role Theory and Work-Family Interface for Understanding School-Sport Balance. Overall, role theory has considerable strengths that helped conceptualize my school-sport balance construct. First, the organizational perspective offers a detailed view of balance among work and family domains. This makes role theory arguably one of the most widely used theoretical frameworks to date when examining two domains. Second, because of the amount of empirical attention that has been devoted to studying work-family interface within role theory, it is possible to clearly identify determinants and consequences of dimensions of conflict and facilitation, as well as the processes, and moderators of work-family conflict and work-family facilitation. Lastly, perhaps one of the most pertinent aspects of this theoretical framework for my understanding of school-sport balance among student-athletes is the taxonomy structure that has been suggested to integrate both dimensions

of balance (conflict and facilitation) and directions (bi-directional) as it provides a comprehensive view of balance among life domains.

Although role theory presents many advantages, it suffers from three major shortcomings. Firstly, role theory has been historically and most frequently studied in terms of work-family interface. To date, few research has applied the perspective of role theory to the sport context (e.g., Wendling et al., 2017). Secondly, research has been for the most part conducted with adults. Some studies have examined work-study interface (e.g., Butler, 2007; Cinamon, 2016; Creed et al., 2015; McNall & Michel, 2011, 2017; Nicklin, et al., 2018; Owen et al., 2018; Park & Sprung, 2013) and family-study interface (e.g., Meeuwisse et al., 2011, 2014) among university students, but much less frequently. Thirdly, few validated measures have assessed both dimensions of work-family interface (i.e., conflict and facilitation) within one questionnaire. These scales are of limited utility for research in student-athletes as they were primarily developed to measure balance between the work and family contexts. Therefore, they are not necessarily appropriate to use with emerging adult undergraduate student-athletes whose primary life domains are school and sports.

The life domains that are targeted in this dissertation are different from the family and work contexts; nonetheless, the academic-athletic and working-family environments seem to share some commonalities. Student-athletes occupy several social roles that can also produce role interference (e.g., school and sport). They are susceptible to experience the phenomena of role conflict and facilitation because they occupy important competing social roles that interact with each other. They also have a limited quantity of resources and must make trade-offs similar to the work-family context. As such, organizational psychologists have mostly examined work and family roles, however, the vast majority of student-athletes who are aged between 17 and 25

years old do not have children or a family that depend on them. They are neither intensely active in the workforce. Nevertheless, it is possible to extend these categories to various other social roles that are more developmentally pertinent to student-athletes. Their primary social roles are school and sports as work and family are the principal roles occupied for most adults in the workforce. In sum, role theory therefore has the potential to be a relevant framework to understand school-sport balance among university student-athletes.

The Educational and Sport Psychology Perspective: Self-Determination Theory

Scholars in educational and sport psychology have also investigated the notion of balance between life domains within the framework of Self-Determination Theory (SDT; Boiché et al., 2015; Boiché & Sarrazin, 2007; Ratelle et al., 2005; Senécal et al., 2001, 2003). More specifically, to date, studies have evaluated the blending of two important domains, including work and family (Senécal et al., 2001), studies and interpersonal relationships (Senécal et al., 2003), school and friendships (Boiché & Sarrazin, 2007), studies and leisure (e.g., Grund et al., 2014; Grund & Senker, 2018; Hofer et al., 2007; Ratelle et al., 2005), and sport and school (e.g., Boiché et al., 2015; Boiché & Sarrazin, 2007; Healy et al., 2016).

Self-determination theory (SDT) has been proven to be a rich framework when investigating the interplay between multiple domains. SDT is a theory of human motivation that provides insight into the different reasons individuals engage in activities (Ryan & Deci, 2000, 2017). SDT suggests that individuals perform an activity for various reasons, which can be regrouped on a continuum including six distinct motives (i.e., amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic). These six categories of motivation can be operationalized within two broader dimensions of motivation, notably autonomous motivation (i.e., self-determined motivation) and controlled motivation (i.e., non

self-determined motivation; Ryan & Deci, 2000, 2017). *Autonomous motivation* is described by the pursuit of an activity for the pure pleasure, the importance of the activity, and is done in a voluntary way (Ryan & Deci, 2000, 2017). *Controlled motivation* is characterized by the pursuit of an activity because of reasons that are external to the self, to obtain rewards, avoid pressure or feelings of guilt and shame (Ryan & Deci, 2000, 2017). According to SDT, the more individuals develop autonomous motivation to engage in their different activities out of choice (e.g., sport and school), the more their activities are internalized within their self, and in turn, the less they will experience conflict between their concurrent activities (Ryan & Deci, 2000, 2002, 2017). On the contrary, when activities are completed because of controlled motives, these activities are not truly integrated within their self, and therefore, individuals will perceive more conflict between their concurrent activities (Ryan & Deci, 2000, 2002, 2017). Furthermore, scholars in SDT have posited that more autonomous types of motivation are associated to more positive outcomes, while more controlled types of motivation are linked to more negative outcomes (e.g., Ryan & Deci, 2000, 2002; Vallerand, 1997). These assumptions will provide rationel to suggest potential antecedents and consequences of school-sport balance in Article 2.

Strengths and Limitations of SDT for Understanding School-Sport Balance. The greatest strength of this perspective is that SDT is a well-established framework of human motivation. A handful of studies that have investigated inter-role conflict between two life domains have established that motivation can be an antecedent to role conflict (e.g., Boiché et al., 2015; Boiché & Sarrazin, 2007; Ratelle et al., 2005; Senécal et al., 2001, 2003). These findings are pertinent to this dissertation as it is possible to make inferences in order to establish that motivation could be an antecedent to our construct of school-sport balance, which will be examined in Article 2. Despite that SDT has been proven to be a rich framework when examining life domains, research

in SDT has commonly been conducted within one life domain (Healy et al., 2016). Therefore, this is an important limitation as few studies have examined the exact combination of school and sport roles among university student-athletes.

The Sport Psychology Perspective: A Holistic Approach

In sport psychology, a plethora of authors scientists have investigated student-athletes. When focusing specifically on the conciliation of multiple domains among student-athletes, research on dual careers has received increasing consideration within the last decade (Guidotti et al., 2015; Li & Sum, 2017; Stambulova & Wylleman, 2019). The theoretical framework that has been proven to be the most useful when understanding the interaction between student-athletes' athletic and academic domains, is the holistic perspective (Wylleman et al., 2004, 2013).

It is only in the late 1990s that researchers have moved towards a more holistic life-span perspective of athletic involvement (Wylleman et al., 2004). More importantly, research shifted from viewing the development of athletes as being influenced only by their sports to developing a more nuanced view of athletic development and understanding athletes within their multiple domains and life transitions (Wylleman et al., 2004, 2013). Notably, the Holistic Athletic Career Model (Wylleman et al., 2013) has been recognized as an important framework to illustrate the transitions throughout athletes' career. It has been particularly useful to understand the athlete as a whole person (e.g., Debois et al., 2015; Stambulova et al., 2015). This model is an important contribution to the student-athlete research, and particularly for this dissertation as it provides a conceptual model to understand the interaction between student-athletes' academic and athletic domains.

The Holistic Athletic Career Model is composed of various levels and transitions (Wylleman et al., 2013). More specifically, the interactive levels are composed of athletic

(initiation, development, mastery, and discontinuation), psychological (childhood, puberty, adolescence, and young adulthood), psychosocial (reflecting changes in athletes' social networks), academic/vocational (primary education, secondary education, higher education/semi-professional athlete, and post-athletic career), and financial (referring to the dynamics of financial support sources for athletes; Wylleman et al., 2013). The transitions refer to athletes' age/developmental period. One important feature of the holistic athletic career model is that athletic career development is characterized as being multilevel (Wylleman et al., 2013). As such, this model is helpful in understanding that athletes are not only influenced by the athletic level, but also by different developmental phases and by different co-existing domains of life. The most relevant aspect of the holistic lifespan perspective for this dissertation is that it provides a model that integrates the interplay of sport and education. The holistic perspective appears to be particularly relevant for examining university student-athletes perception of their concurrent school and sport domains. This model has provided a developmental understanding about the combination of athletes' academic and athletic domains (e.g., Wylleman & Lavallee, 2004).

Strengths and Limitations of the Holistic Perspective in the Understanding of School-Sport Balance. The greatest strength of the dual career perspective is that athletes are viewed within a holistic lens. This allows researchers to have an in depth understanding of student-athletes' experience because athletes are not only sport performers. The most important contribution of the holistic perspective for the understanding of school-sport balance resides in the fact that it provides a theoretical foundation for the interaction between student-athletes' school and sport domains. Although it offers a comprehensive framework to understand various transitions in the lives of athletes as well as the dual careers of student-athletes, the major

shortcoming is that it does not provide a concrete way to measure the interplay between athletes concurrent academic and sport demands. Article 1 of this dissertation will therefore develop a tool to assess the perception of balance between the school and sport domains of university student-athletes.

Overview of Relevant Measures in the Current Literature

To the best of my knowledge, a limited number of studies have measured student-athletes' perception of balance among their academic and athletic domains (e.g., Boichée et al. 2015; Boiché & Sarrazin, 2007; van Rens et al., 2016; Yukhymenko-Lescroart, 2014). As highlighted above, different approaches have been adopted to understand the interaction between multiple domains, which have led researchers to develop various measures. The following section will review some relevant measures that were used in the literature to assess the interaction between multiple domains with university students and student-athletes.

Most studies that have measured family-study interface in university students (Meeuwisse et al., 2011, 2014) have used questionnaires that were developed to measure work-family conflict and work-family facilitation (e.g., Butler et al., 2005; Carlson et al., 2000; Grzywacz & Butler, 2005) and adapted these for their study. Similarly, studies that have focused on the work-school interface among university students (e.g., McNall & Michel, 2011, 2017; Nicklin et al., 2018) have also adapted existent measures that were developed to assess work-family conflict and facilitation in adults (e.g., Carlson et al., 2006, 2009; Netemeyer et al., 1996). Moreover, studies examining university students work-family conflict (e.g., Pluut et al., 2015; Senécal et al., 2001), have similarly modified measures that were initially developed for assessing work-family conflict in adults.

Likewise, studies that measured study-leisure conflicts among university students have used conflict scenarios. For example, participants were asked to read specific scenarios about conflict between the leisure and academic domains. They must then answer questions referring back to the scenario (Fries et al., 2008; Grund & Fries, 2012; Hofer et al., 2010). Another study that examined study-leisure conflict in university students developed a questionnaire for their study to measure the extent to which leisure activities interfere with academic activities (Ratelle et al., 2005). However, this questionnaire was not validated.

Lastly, some studies have specifically measured the interplay of the school and sport domains in student-athletes. Among these, some studies have developed and validated scales to specifically examine student-athlete identities (e.g., Settles et al., 2002; Yukhymenko-Lescroart, 2014) or goal conflicts (e.g., Riediger, 2001). Other studies have actually investigated the concurrent school and sport of student-athletes in terms of inter-role conflict. There seems to be two questionnaires that have been developed for this purpose. First, Boiché and Sarrazin (2007) developed a questionnaire for their study to assess inter-domain conflict and facilitation in high school student-athletes. Their measure was composed of four subscales : (a) conflict education to sport (e.g., if I didn't have so much schoolwork, I would have the time to do more sport), (b) conflict friendship to sport (e.g., if I had fewer friends, I could do more sport because I would have more time to do so), (c) instrumentality sport to education (e.g., doing sport is a good thing for my schoolwork because I am in better shape), and (d) instrumentality sport to friendship (e.g., doing sport is a good thing for friendship because I meet many nice people). Although the conflict education to sport (i.e., assessing the perception that education conflicts with sport) and the instrumentality sport to education (i.e., assessing the perception that sport helps/facilitates education) subscales tap into the concepts of role conflict and role facilitation, this questionnaire

was not validated and it was developed for high school-students. Also, the bi-directional relationship between the school and the sport domain is lacking in that they have not taken into account that their school could impact their sport domain and vice-versa. Second, Van Rens et al. (2016) have recently developed and validated a questionnaire to assess the experience of high school student-athletes' role strain among their meaningful life domains (e.g., school, sport, family, and friendship). This questionnaire was composed of five subscales: (a) overload in sport and between roles - *dual carer overload* (e.g., my body is tired because I do a lot of sport, I can't spend enough time with my friends because I am too busy), (b) ambiguity (e.g., I don't know what to do to become a successful student, I don't know what to do to become a successful athlete), (c) overload in school (e.g., school and homework take up too much of my time, my schoolwork is too difficult), (d) underload (e.g., I am not challenged at school, my roles aren't challenging enough), and (e) conflict (e.g., I have to do things for my sport that I don't really want to do, I don't like parts of my training program). Only one of the subscales assesses conflict between multiple domains (i.e., dual career overload); yet, no items of this scales explicitly assesses the combination between the school and sport domains. Additionally, this study examined high school student-athletes, which is not particularly suitable for trying to understand the context of university student-athletes.

In sum, the available questionnaires are not fully pertinent to assess school-sport balance among university student-athletes. There are at least three major issues with the current measures. First, the theoretical background used to develop the scales represent an important issue. As such, studies with a focus on student-athletes did not specifically position their scale within role theory (i.e., dimension of role conflict and facilitation). Second, although studies examining study-family and family-work interface have used the theoretical framework of role

theory, the domains measured in their studies is a significant limitation. The purpose of this dissertation is to assess the perception that university student-athletes have of balance between the academic and athletic domains. Finally, the population that was examined in all of these studies represent the last major issue. Importantly, questionnaires that have been developed to evaluate student-athletes' competing school and sport roles have often investigated high school student-athletes. This represents a different developmental period than the focus of this dissertation. In fact, high school student-athletes and university student-athlete may have quite distinct experiences. For instance, university students have much more freedom, make more independent choices, are legally adults, and are often financially independent (Arnett, 2004). Taken together, these issues present major theoretical and conceptual limitations.

Towards our School-Sport Balance Perspective

The purpose of this dissertation was to address the limitations and gaps in the literature by developing a construct that allows to better understand the perception of student-athletes who attend university while participating in sports. As discussed above, studies conducted thus far have limitations in their understanding of the interplay between academic and athletic domains. Nevertheless, they also have strengths that complement each other. These strengths have contributed to the development of my construct of school-sport balance. First, the extensive research conducted in organizational psychology using the role theory framework led us to theorize a multidimensional taxonomy of school-sport balance that comprises school-sport and sport-school conflicts, as well as school-sport and sport-school facilitations. Second, research that has investigated multiple domains with SDT has offered insight on the relationship between school-sport balance and potential motivational antecedents and mental health outcomes. Thirdly, the literature on dual careers in athletes situates our theory within a holistic perspective

and justifies the importance of examining the dynamic interplay between athletic and academic domains in student-athletes. Hence, the main purpose of this dissertation was to provide a comprehensive understanding of the perception of the interplay between the athletic and academic domains of university student-athletes.

Defining School-Sport Balance

School-Sport Balance is defined as a multidimensional construct that describes the combination, for better or worse, of the perception that university student-athletes have regarding their concurrent school and sport commitments. On one hand, *conflict* between the school and the sport domains is defined as the interference of the demands (i.e., school pressure, pressure to perform in school/sport, high physical demands, psychological/emotional demands, lacking time, etc.) of one role with the demands of the other role. School-sport conflict occur when sport demands and school demands are mutually incompatible. For instance, school demands could occupy all of an athlete's time and energy and thus hinder their sport demands (i.e., school-sport conflict) and vice versa (i.e., sport-school conflict). For example, a university student-athlete may experience conflict when they spend more time preparing for an exam instead of going to their sport practice. Another student-athlete may experience conflict when they are tired from a demanding week of sport training and decides to miss some classes to recuperate.

On the other hand, *facilitation* between the school and sport domain is depicted as when one role improves or strengthens another role. Athletes can experience role facilitation when their school commitments could offer resources (i.e., social support, autonomy, constructive feedback, skills acquired, etc.) that positively spill over to their sport commitments (i.e., school-sport facilitation), and vice versa (i.e., sport-school facilitation). For instance, a student-athlete may experience facilitation if they get positive feedback on an assignment which could

positively influence their attitude at their next practice. Other student-athletes may perceive facilitation if they learn important skills (i.e., self-discipline, time management, etc.) because of their sports which can then help be better organized at school. Hence, balance can be characterized as a mixture of both dimensions of conflict and facilitation. For instance, an university student-athlete may be low on each direction of influence and low on each type of effect (i.e., low school-sport conflict, low sport-school conflict; low school-sport facilitation; and low sport-school facilitation), while another university student-athlete may be high for the school-sport direction and low on the sport-school direction (i.e., high school-sport conflict, low sport-school conflict, high school-sport facilitation, and low sport-school facilitation). It is also possible to organize school-sport balance into four dimensions : (1) school-sport facilitation, (2) sport-school facilitation, (3) school-sport conflict, and (4) sport-school conflict. This taxonomic conceptualization was inspired from the literature in organizational psychology (e.g., Frone, 2003).

Main Assumptions of the School-Sport Balance Construct

The School-Sport Balance Construct (SSBC) contains five assumptions that have been inspired by prior research within the perspectives of role theory, SDT, and the holistic perspective of student-athletes. The first four assumptions will be addressed in Article 1, whereas the fifth assumption will be examined in Article 2.

Assumption 1: bidirectional influence. First, I posit that two directions of influence can exist between school and sport demands, such as school to sport influence and sport to school influence (Frone, 2003). A *school to sport influence* (school → sport) is believed to occur when student-athletes' school demands have either a positive or negative impact on their sport demands, whereas a *sport to school influence* (sport → school) arises when it is their sport

demands that influence their school demands. Figure 1 presents a graphic that illustrates the direction of influence of the school-sport balance perspective. The top part of Figure 1 illustrates the school-sport direction while the bottom part of this figure illustrates the sport-school direction. Hence, I expect that two directions of influence will arise from the school-sport balance construct: (1) school-sport influence and (2) sport-school influence

Assumption 2: Type of effect. Second, it is theorized that there are two types of effect (i.e., synergy and interference) that stem from the bidirectional influence between school and sport demands (Frone, 2003). To date, the literature has commonly named these types of effect: facilitation and conflict. For sake of conceptual clarity, we will use the terms synergy and interference rather than facilitation and conflict. Synergy stems from the same premises as facilitation and interference to conflict. Figure 1 illustrates these two types of effect. On the right side of Figure 1 interference is presented and on the left side of Figure 1 synergy is showed. First, student-athletes can feel *synergy* when their school and sport demands are in congruence or even strengthen one another. For example, their school commitments could offer resources that positively spill over to their sport commitments and vice versa. Second, student-athletes can experience *interference* when their sport demands and school demands are incompatible. For example, their school demands could occupy many physical and psychological resources and therefore obstruct their sport demands, and vice versa. I therefore predict that two types of effect will occur: (1) synergy and (2) interference, which will be respectively beneficial and detrimental.

Assumption 3: Hierarchical structure. Thirdly, I posit that student-athletes can experience both synergy and interference concurrently (Carlson et al., 2006, 2009; Grzywacz & Butler, 2005; Karatepe & Bekteshi, 2008; Riediger & Freund, 2004). SSB cannot be merely

situated on a single continuum. Rather, we operationalized the School-Sport Balance (SSB) as two orthogonal (i.e., entirely distinct dimensions) dimensions that can lead to four factors: 1) school-sport facilitation; 2) sport-school facilitation; 3) school-sport conflict; and 4) sport-school conflict. Figure 2 presents the hierarchical structure of the school-sport balance construct that has been conceptualized for this dissertation. Figure 2 shows that school-sport balance is presented by two orthogonal dimensions (interference and synergy). We also see in Figure 2 that the interference dimension leads to school-sport conflict and sport-school conflict, while the synergy dimension leads to school-sport facilitation and sport-school facilitation. I expect that two orthogonal higher order dimensions will depict the hierarchical structure of our school-sport balance construct. More specifically, I expect that these two higher order dimensions will encompass four lower order factors: (1) school-sport facilitation, (2) sport-school facilitation, (3) school-sport conflict, and (4) sport-school conflict.

Assumption 4: Nomological network. Fourthly, I expect that both dimensions are distinct and associated differently with developmental correlates (Frone, 2003; Grzywacz & Butler, 2005; Karatepe & Bekteshi, 2008). Namely, school-sport facilitation and sport-school facilitation should usually be associated with positive outcomes in terms of youth development, whereas school-sport conflict and sport-school conflict should usually be related to negative outcomes in terms of youth development.

Assumption 5: Antecedents and Consequences of School-Sport Balance. Finally, I propose antecedents and consequences of school-sport balance. More specifically, I suggest that motivation will act as an important antecedent to school-sport balance, while stress and mental health will be significant outcomes.

Antecedents of school-sport balance. I estimate that school and sport motivation is an antecedent of school-sport balance as it includes reasons why young people engage in meaningful activities (i.e., school and sport self-determination motivation). As reviewed above, one main assumptions of SDT is that individuals can experience inter-role conflict when two different life contexts are not integrated to one's self-concept (Ryan & Deci, 2000, 2002). Thus far, the framework of SDT has been used within some studies (e.g., Boiché et al., 2015; Boiché & Sarrazin, 2007; Healy et al., 2014, 2016; Ratelle et al., 2005; Senécal et al., 2003) that have examined contextual self-determined motivation (e.g., school, sport, leisure, friendship self-determined motivation) in relation to interdomain conflict. This therefore provides pertinent evidence to suggest that school and sport motivation should act as a predictor of school-sport balance which could predispose university student-athletes to perceive differently their school-sport balance.

Consequences of school-sport balance. Mental health issues is a growing concern within the university setting and the sport context (ACHA, 2016; Van Slingerland et al., 2018). Stress is also often mentioned as an important factor related to mental health issues (Cohen et al., 2007; Hammen, 2015; Shankar & Park, 2016). Hence, I posit that stress and mental health (i.e., depression and anxiety symptoms) will be two important consequences associated to school-sport balance.

According to the Transactional Model of Stress and Coping from Lazarus and Folkman (1984), "psychological stress is a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). This explanation depicts stress as being a subjective process and suggests that stress is the consequence of perceiving that we do not have

resources to manage our external and internal demands (Lazarus & Folkman, 1984). Stressors can be physical or psychological, including factors such as role conflict (Lazarus & Folkman, 1984). For example, in the context of university student-athletes, this suggest that university student-athletes will feel stress when the interplay between their school and sport demands conflict. In other words, when demands from their school and sport domains surpass their perceived resources, student-athletes can feel conflict between their multiple life domains which can in turn lead to stress. The transactional model of stress and coping provides theoretical rationale for the association between school-sport balance and stress among university student-athletes. When individuals feel more conflict between their school and sport roles, they will perceive more stress because of the subjective perception that they do not hold the resources to manage their multiple domains. Specifically, a comprehensive review of the outcomes of work-to-family conflict concluded that stress was a significant consequence of work-to-family conflict (Amstad et al., 2011). Recently, Nicklin et al., (2018) found that work-school conflict was a significant predictor of stress, whereas work-school facilitation was not significantly related to stress among graduate university students. In a similar vein, studies in sport psychology have revealed that stress was linked to student-athletes' interface between their school and sport contexts (Settles et al., 2002; van Rens et al., 2016).

In this dissertation, mental health will be operationalized in terms of internalizing symptoms (i.e., depression and anxiety symptoms). Internalizing symptoms are prevalent psychological health challenges among adolescents and emerging adulthood (Rohde et al., 2013). Accordingly, anxiety and depression are among important mental health problems identified by college student athletes (Edwards, 2018). A recent meta-analysis that has only considered goal conflict, has showed that higher levels of goal conflict was negatively correlated with

psychological wellbeing (Gray et al., 2017). Similarly, another review of the literature studying school-work-life interface among university students indicated that work-school conflict has been linked with reduced psychological health (Choo et al., 2019). When examining university-students, studies revealed that study-family conflict was related to more mental health distress, while study-family facilitation was associated to better psychological health (Creed et al., 2015; McNall & Michel, 2017; Park & Sprung, 2013). In the educational context, school-leisure conflict was also associated with more depression and less life satisfaction among university students (Ratelle et al., 2005). Furthermore, a study in sport psychology demonstrated that adults who reported higher levels of interference between their sport and interpersonal relationships had greater depressive symptoms (Jowett & Cramer, 2009).

The Present Dissertation

The overarching objective of the present dissertation was to have a greater understanding of university student-athletes' perception of their role balance between their school and sport domains: *School-sport balance*. The current literature has suffered from both theoretical and methodological caveats that will be addressed in three ways in the current doctoral dissertation. I will (1) provide a new conceptual model of school-sport balance among university student-athletes, (2) develop and validate a questionnaire to assess the construct of school-sport balance, and (3) test a mediation model of school-sport balance with potential antecedents and outcomes. Two articles with two independent samples present the empirical findings of this dissertation. Although these two studies have different and specific research objectives, they are nonetheless complementary and provide together a springboard to better understand the phenomenon of school-sport balance in university student-athletes. Of note, the population of student-athletes in this dissertation refer to university students who are between the ages of 17 and 25 years old and

participate in a sport competitively (i.e., in a university competitive team or in a community competitive team). More specifically, participants who were selected in both studies of this dissertation, are athletes in an undergraduate program who compete in a sport. They must at least be at a regional level of competition (i.e., ranging from the regional to the international level). Therefore, no students who participated in a sport at a recreational level were selected. Although this population of student-athletes is somewhat diverse in terms of their level of competition, they share many similarities as they all compete in their sport at least at a regional level and attend the same university.

The objective of *Article 1* was to develop a questionnaire and conduct the preliminary validation of the school-sport balance scale (SSBS), a questionnaire indented to measure the perception of conflict and facilitation experienced by university student-athletes. The development of the SSBS scale was guided by existing theoretical frameworks and questionnaires of balance that were presented in the general introduction. In *Article 2,* we furthered our understanding of the concept of school-sport balance by examining its potential antecedents and consequences. Thus, Article 2 tested a serial mediation model in which contextual motivation (school and sport) leads to mental health, through school-sport balance and contextual stress (school and sport), respectively.

The remainder of the dissertation is organized into three chapters. Chapter 2 presents *manuscript 1* entitled “A Preliminary Validation of the School-Sport Balance Scale among Canadian University Student-Athletes”. Chapter 3 consists of *manuscript 2* entitled “School-Sport Balance among University Student-Athletes: Identifying Potential Motivational Antecedents and Mental Health Outcomes”. The general discussion of the present dissertation

comprises Chapter 4, which consists of overall findings from both articles are discussed, as well as study contributions, limitations, and future research directions.

Type of Effect

Direction of Influence	Interference Dimension	Synergy Dimension
School-Sport	School-Sport Conflict	School-Sport Facilitation
Sport-School	Sport-School Conflict	Sport-School Facilitation

Figure 1. Direction of influence and type of effect of school-sport balance inspired by Frone, (2003)

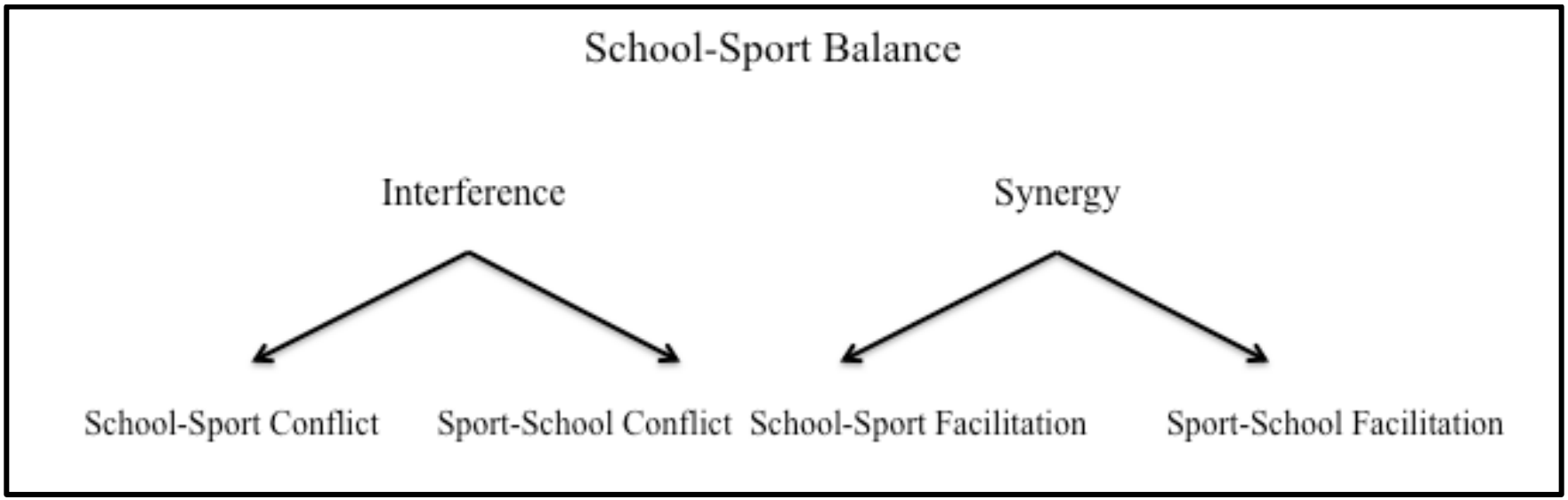

Figure 2. The hierarchical structure of the dimensions conceptualized as School-Sport Balance

Table 1

The three domains of psychology that school-sport stems from, the theories, sub-theories, definitions, and their relationship to the school-sport balance construct

Domain of Psychology	Theories	Sub-Theories	Definitions	Relationship to the school-sport balance construct
Organizational Psychology	Role Theory (Kahn et al., 1964)		Social roles (i.e., work, family, leisure, etc.) are significant in the lives of individuals and that every social role that an individual occupies has responsibilities that are attached to this role (Kahn et al., 1964).	The social roles as students and athletes
		Role Interference (Kahn et al., 1964)	Arises from the interaction between two competing social roles (e.g., work vs. family; sport vs. school, etc.).	
		Scarcity perspective (Ayree et al., 2005)	The scarcity perspective stipulates that an individual has a limited amount of resources (i.e., time and energy). As a result of participating in multiple roles (e.g., school, sport, family, work, etc.) individuals allocate more resources to one role and fewer resources to another role	School-Sport Interference Dimension

			(Greenhaus & Beutell, 1985; Greenhaus & Powell, 2003), and in turn, they make trade-offs to decrease the amount of role strain they experience (Ayree et al., 2005).	
		Expansion-enhancement perspective (Ayree et al., 2005)	Participating in multiple roles produces positive gains that may outweigh the costs related with multiple roles (Greenhaus & Powell, 2006).	School-Sport Synergy Dimension
	Role Conflict		Expressed as "a form of inter-role conflict in which the role pressures from the work and non-work domains are mutually incompatible so that participation in one role (work) role is made more difficult by virtue of participation in another role (family)", and vice-versa (Greenhaus & Beutell, 1985, p. 77).	School-Sport Interference Dimension
	Role Facilitation		Refers to "the extent to participation at work (or home) is made easier by virtue of the experiences, skills, and opportunities gained or developed at home (or work)" (Frone, 2003, p.145).	School-Sport Synergy Dimension

Educational and Sport Psychology	Self Determination Theory (SDT; Ryan & Deci, 2000, 2017).	SDT is a framework of human motivation that identifies the different reasons why individuals engage in an activity (autonomous/self-determination motivation vs. controlled/non-self-determination motivation; Ryan & Deci, 2000).	Motivation as an antecedent to the school-sport balance construct. SDT also provides rationale for the association between school-sport balance and potential motivational antecedents and mental health outcomes.
Sport Psychology	Holistic Athletic Career Model (Wylleman et al., 2013).	The model represents the holistic lifespan perspective of the athlete career development, including the concurrent interplay of the athletic, psychological, social, academic/vocational, and financials domains (Wylleman & et al., 2013).	Positions the school-sport balance within a “whole-person” lens and justifies the importance of examining the interplay between the athletic and academic domains.

CHAPTER 2: A Preliminary Validation of the School-Sport Balance Scale among Canadian University Student-Athletes

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Abstract

This study reports the preliminary validation of the School-Sport Balance Scale (SSBS), which evaluates how university student-athletes perceive balance between school and sport. Notably, the SSBS posits that school and sport activities have bidirectional influences that are both beneficial (e.g., both activities can facilitate each other) and detrimental (e.g., both activities can conflict with each other) for youth development. We used Role Theory (Kahn et al., 1964) as the main theoretical framework to develop the SSBS. We report the preliminary validation of the SSBS in terms of content validity, factorial validity, internal consistency, and a nomological network of developmental correlates (i.e., personality, motivation, mental health, wellbeing, as well as sport and school adjustment). The sample consisted of 105 undergraduate university student-athletes who were between the age of 17 and 25 years old. Confirmatory factor analyses (CFA) indicated that the SSBS has a four-factor structure that translates into four subscales: (1) school-to-sport conflict; (2) sport-to-school conflict; (3) school-to-sport facilitation; and (4) sport-to-school facilitation. Internal consistency was good for all subscales. As expected, sport-to-school and school-to-sport conflicts were generally associated with detrimental correlates. However, surprisingly, school-to-sport conflict was also associated with some benefits (e.g., sport autonomous motivation). As anticipated, sport-to-school and school-to-sport facilitation were mainly linked to beneficial correlates. Nonetheless, intriguingly, sport-to-school and school-to-sport facilitation were also linked to some detrimental correlates (e.g., controlled sport and school motivation). In sum, our results suggest that there might be both developmental benefits and detriments for those students who engage in sports at university.

Keywords: school-sport balance, student-athletes, validation, scale development

A Preliminary Validation of the School-Sport Balance Scale among Canadian University Student-Athletes

University student-athletes face the complex challenge of finding balance between educational and sport commitments that are increasingly demanding and time-consuming. In recent years, researchers in sport psychology have strived to better understand athletes within a holistic perspective expressing that they are not only sport performers, but also individuals that must reach balance between their sport and other important domains (e.g., Wylleman & Lavallee, 2004). The perception of balance has been widely studied across different areas of psychology, such as organizational psychology (e.g., work-family conflict, work-family facilitation), sport psychology (e.g., dual career, dual roles, student-athlete identity), social psychology, and educational psychology (e.g., goal conflict, study-leisure motivational interferences). In sport psychology, where much attention has been devoted to understanding the combination of school and sport roles, the researchers nevertheless lacks agreement in the way balance between such roles is operationalized in university student-athletes (Wylleman et al., 2004). In fact, few reliable and valid measurement tools have been developed to assess the perception that university student-athletes have of school-sport balance. Therefore, this study conducted the preliminary validation of the School-Sport Balance Scale (SSBS), which evaluates how university student-athletes perceive balance between school and sport.

Conceptualizing Balance through Role Theory

We conceptualize balance mainly within the theoretical framework of *Role Theory* (Kahn et al., 1964), which has been traditionally used to examine the interplay between multiple domains in organizational psychology, particularly between the work and family domains. Role theory postulates that social roles (e.g., work, family, leisure, etc.) are significant in the lives of

individuals and that each social role entails responsibilities (Kahn et al., 1964). Role Theory has been operationalized through two alternative perspectives (Greenhaus & Powell, 2006). On the one hand, the *scarcity perspective* posits that individuals have a finite amount of psychological and physical resources (Greenhaus & Beutell, 1985; Greenhaus & Powell, 2003). Multiple roles increase the amount of resources needed and thereby individuals must make trade-offs to avoid depletion (Greenhaus & Powell, 2006), which in turn creates role conflict. On the other hand, the *expansion-enhancement perspective*, suggests that multiple roles can also generate gains that can outweigh the costs associated with multiple roles (Greenhaus & Powell, 2006), notably because roles produce positive spillover effects onto one another.

Proponents of Role Theory have suggested two broad dimensions to integrate both *scarcity and expansion-enhancement perspectives* on multiple life domains: (1) role conflict; and (2) role facilitation (Frone, 2003). *Inter-role conflict* refers to discordant demands between social roles (Greenhaus & Beutell, 1985). Specifically, when demands from a given role are incompatible with demands from another role, stress arises and conflict occurs between these roles (Greenhaus & Beutell, 1985). For example, a university student-athlete might have an important swimming competition on a weekend that otherwise could have been devoted to studying for upcoming exams the following week. In contrast, *Inter-role facilitation* can occur between two life domains when one domain offers resources that can be used in the other domain; thus, both domains are in congruence as one role makes it easier to engage in the other one (Frone, 2003; Greenhaus & Powell, 2006). For instance, a university student-athlete might have learned self-discipline or teamwork in their sport, which could help them to study for an exam or organize a team project for a course. Interestingly, conflict and facilitation are distinct constructs that can be experienced concurrently, as previously evidenced in organizational

psychology (Carlson et al., 2006, 2009; Grzywacz & Butler, 2005; Karatepe & Bekteshi, 2008; Riediger & Freund, 2004). Furthermore, inter-role facilitation and inter-role conflict have been shown to be respectively linked to more positive and negative outcomes, respectively (for a review, see Choo et al., 2019).

Within the role theory literature, Frone (2003) has suggested a multidimensional notion of balance within a taxonomic structure, which spans essentially across family and work domains. This taxonomy encompasses both dimensions of balance (i.e., conflict and facilitation) and posits a two-way influence within a bidirectional relationship, namely from work to family and from family to work. This logic yields four types of work-family balance, consisting of: (1) family-to-work conflict; (2) work-to-family conflict; (3) family-to-work facilitation; and (4) work-to-family facilitation (e.g., Frone, 2003). Conceptually, however, we suggest that this multidimensional outlook on balance could also entail that there are two broader functional principles that may subsume the four types, namely *Interference* (e.g., family-to-work and work-to-family conflicts) and *Synergy* (e.g., family-to-work and work-to-family facilitations). Empirically, however, studies have never confirmed any hierarchical factor structure for such higher-order taxonomy (Brough et al., 2014).

The principles of Role Theory mainly originate from organizational psychology and has less frequently been applied to other domains. To our knowledge, few studies have adopted the perspective of Role Theory to examine the perception that student-athletes have of balance between school and sport. That said, some studies have begun to examine the interplay of multiple domains in the lives of student-athletes (Boiché et al., 2015; Boiché & Sarrazin, 2007; Healy et al., 2016; van Rens et al., 2016, 2018). To our knowledge, although some questionnaires have been validated to assess the perception of balance between multiple domains

in student-athletes (Riediger, 2001; Riediger & Freund, 2004; van Rens et al., 2016), they were not validated to specifically assess school-sport balance among university students.

The Present Study

The aim of this study is to develop and conduct the preliminary validation of the School-Sport Balance Scale (SSBS) in university student-athletes. We propose three specific hypotheses. First, we posit that there can be a *bidirectional influence* between school and sport demands, namely a school to sport influence and a sport to school influence. A *school to sport influence* is believed to occur when student-athletes' school demands have either a facilitating or conflicting impact on their sport demands, whereas a *sport to school influence* arises when it is their sport demands that have either a facilitating or conflicting impact on their school demands. Consequently, we posit that this yields four basic dimensions: (1) school-to-sport conflict; (2) sport-to-school conflict; (3) school-to-sport facilitation; and (4) sport-to-school facilitation. As mentioned previously, this taxonomic conceptualization was inspired from the literature on role theory in organizational psychology (e.g., Frone, 2003). In sum, conceptually role theory served as the main theoretical background to establish the content validity of the items of the SSBS, notably in terms of capturing the multidimensional and bidirectional nature of school-sport balance. Empirically, factorial validity is tested to examine if there are four dimensions of school-sport balance. In practice, these dimensions are subscales and we also test their respective internal consistency.

Second, we posit that there might also be *two overarching dimensions*, independent of each other that subsume the bidirectional influences between school and sport demands, namely synergy and interference. More precisely, a higher order dimension called 'interference' should encompass both school-to-sport and sport-to-school conflicts, whereas a higher order dimension

called ‘synergy’ should encompass both school-to-sport and sport-to-school facilitations. Hence, interference means that school and sport demands are hindering each other, whereas synergy means that school and sport demands are helping each other. This is also tested within factorial validity as we examine if there are two higher-order factors (interference and synergy) that subsume the four basic dimensions (school-to-sport conflict; sport-to-school conflict; school-to-sport facilitation; and sport-to-school facilitation).

Third, it is postulated that school-sport balance is associated with *developmental benefits and detriments*. More specifically, school-to-sport facilitation and sport-to-school facilitation should be associated with beneficial correlates in terms of youth development, whereas school-to-sport conflict and sport-to-school conflict should be related to detrimental correlates in terms of youth development. In our study, beneficial and detrimental developmental correlates are situated within the realms of personality traits (extraversion, agreeableness, conscientiousness, emotional stability, openness), motivation (autonomous and controlled), mental health (internalizing symptoms), wellbeing (positive affect, negative affect, and sport burnout), as well as sport and school adjustment (stress, dropout intentions, and sport goal attainment). In psychometric terms, these developmental correlates represent a nomological network for school-sport balance.

Overview of the Study

In sum, the objective of this study is to develop and conduct the preliminary validation of the School-Sport Balance Scale (SSBS) in university student-athletes. Recently, the APA has provided standards for educational and psychological testing (Chan, 2014). They state that not only one source of evidence can support the validity of an instrument. Chan (2014) however indicates that construct validity is the primary element in the process of validation and that five

sources of evidence can be used when validation a measure based on : 1) test content, 2) response process, 3) internal structure, 4) on relations to other variables, and 5) consequences. More particularly, the purpose of this study was to develop the scale of school-sport balance and to gather evidence for validity based on internal structure and on relations with external variables (i.e., nomological network). The measure section of this study comprises a description of the methods that was used to develop the school-sport balance scale. The internal structure of this scale was then tested. The other measures in this study were used to establish evidence for the validity based on relationship with external variables (i.e., nomological network).

Method

Participants and Design

The initial recruitment consisted of 290 undergraduate student-athletes who participated in our online survey. However, 46 survey entries were not utilized because a technical glitch prevented those participants from entering their needed participation code in the online survey (n = 244). Furthermore, 33 participants completed a French version of the survey but were not included in the final analyses because ultimately, we could not ascertain the cross-cultural equivalence of measures, particularly between the French translations and original English versions (n = 211). Also, we only retain those who reported participating in a competitive sport during the last six months, which resulted in 99 participants who were not included in the final sample (n = 112). Given our developmental focus, we kept only participants who were aged between 17 and 25 years as they were the closest to emerging adults (18-25 years; Steinberg, 2011) within the context of their university campus, which means that five participants were not included in the final sample (n = 107). Given the psychometric aim of this study, two participants were not included in the final sample because they did not answer any item from the school-sport

balance scale (n = 105). No participants were identified as a multivariate outlier with the Mahalanobis technique ($p < .001$).

In sum, the final sample included 105 participants aged between 17 and 25 years of age (M =19.29 years; SD = 1.60 years; 65.7% female) who were enrolled in diverse programs of study in a large Canadian university. They described themselves as Caucasian/white (59%), African Canadian/black (10%), East Asian (9%), South Asian (6%), Aboriginal/Native (3%), Middle Eastern (5%), or other (8%). Participants reported different sport backgrounds and their competitive levels ranged from regional to international. They also practiced their sport on an average of 10.61 hours per week. Less than five percent of cases on each variable were missing and therefore mode substitution at the item level was chosen as the method to replace missing data (Tabachnick & Fidell, 2017).

Procedure

The ethical aspect of this study was reviewed and approved by the research ethics board at the university of the authors. Participants were recruited through an online research participation pool at the authors' university. This system compensates participants with one point in their introductory psychology course. Participants voluntarily enrolled in this study and provided their informed consent prior to participating. Those who consented were provided access to a secure web survey on PsychData.com.

Measures

School-Sport Balance. We developed the School-Sport Balance Scale (SSBS) to measure perceived school-sport balance. The initial version contains 54 items (see Table 1) and the final validated version contains 12 items from the initial version (see appendix). Participants were asked to indicate the extent to which each statement corresponded to their experience in the

past six months using a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). To develop the SSBS, five steps were taken. First, we conducted a thorough review of the current literature on similar constructs measuring balance within the role theory framework, as well as on compatible scales in the literature (e.g., Boiché & Sarrazin, 2007; Brough et al., 2014; Carlson et al., 2006; Grzywacz & Butler, 2005; Meeuwisse et al., 2011; Ratelle et al., 2005). Second, we wrote a pool of 54 items that could potentially capture the content of four dimensions/subscales of school-sport balance (school-to-sport conflict, sport-to-school conflict, school-to-sport facilitation, sport-to-school facilitation). We first wrote items that were anchors for each dimensions/subscale that would cover the conceptual breadth of the SSBS. It was important that items included on both conflict subscales (sport-to-school conflict and school-to-sport conflict) pertained to the mutual incompatibility (interference) between sport demands and school demands. Items included on the sport-to-school subscale corresponded to the interference of their sport demands with their school demands (i.e., my sport interferes with my school, sports conflicts with school) whereas for the school-to-sport subscale items pertained to the interference of school demands with their sport demands (i.e., my school work interferes with sports, school conflicts with sports). Items that were developed for both facilitation subscales referred to when the role from one domain could improve or strength the role of the other domain (i.e., offer resources or positively spill over to the other role). Therefore, items included on the sport-to-school facilitation subscale (i.e., my experience in sports gives me a more positive attitude for school, my sport helps me succeed more effectively at school) pertained to the positive spillover of sport demands to school demands and vice versa for the school-to-sport subscale (i.e., I have a more positive attitude in sports because of my school experiences, school helps me succeed more effectively in sports). Once we created items that

were considered to be anchors for the SSBS we then expended our scale by developing a pool of potential items. All items of this measure were both inspired from theory and pre-existing measures. However, every item is original. Third, three graduate students and a researcher with expertise in youth development reviewed the initial pool of items for wording and meaning. A discussion was conducted to correctly place each item in one of the four dimensions. When items were unclear or irrelevant, they were rewritten or removed. We therefore sought to develop and retain items that were the most meaningful conceptually to capture the four dimensions of the SSSB. These items were therefore prioritized when developing the final version of this scale. As we will see, the final version of the SSBS consists of 12 items, from which three items belong to each of its four subscales.

Personality traits. We used the 10-item Personality Inventory (TIPI) because it is one of the briefest measures of the Five Factor Model of personality traits (extraversion, agreeableness, conscientiousness, emotional stability, and openness; Gosling et al., 2003). Participants were asked to reflect on and rate how much they agreed with each of 10 statements on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Expectably, given that the TIPI is a very brief measure, its five 2-item subscales showed poor internal consistency: Extraversion ($\alpha = .61$), conscientiousness ($\alpha = .46$), emotional stability ($\alpha = .55$), openness ($\alpha = .18$), and agreeableness ($\alpha = .23$).

Sport Motivation. Sport motivation was measured with the full 28-item Sport Motivation Scale (SMS; Pelletier et al., 1995). Participants were instructed to rate items that referred to reasons for which athletes practice their sport in general. Each item was rated on a 7-point Likert-type scale ranging from 1 (*does not correspond*) to 7 (*corresponds exactly).* This questionnaire contains seven subscales (three of intrinsic motivation combined in one score,

identified, introjection, external, and amotivation). Aggregate scores of autonomous sport motivation (i.e., intrinsic and identified motivation), and controlled sport motivation (i.e., introjection, external, and amotivation) were created for this study. The sport autonomous motivation (α = .95) and sport controlled motivation (α = .85) measures had good internal consistency.

Academic Motivation. The 28-item Academic Motivation Scale (AMS; Vallerand et al., 1992) was also used to measure academic motivation. Participants rated items that asked them reasons for which they go to school in general on a 7-point Likert-type scale ranging from 1 (*does not correspond*) to 7 (*corresponds exactly).* The scores of autonomous motivation and controlled motivation were created as per the SMS. School autonomous motivation (α = .92) and school controlled motivation (α = .76) measures had good internal consistency.

Internalizing symptoms. The 6-item Kessler Psychological Distress Scale (K6+, Kessler et al., 2003) was used to measure participants internalizing symptoms during the past six months. Participants were invited to report how many times they experienced a series of depression and anxiety symptoms ranging from 1 (*all of the time*) to 5 (*none of the time*). For the K6, scores are then reversed when conducting analyses so that higher levels represent more symptoms. The internalizing symptoms scale had satisfactory internal consistency (α = .87).

Positive and Negative Affects. The Positive and Negative Affect Schedule (Watson et al., 1988) was used to assess 20 emotions that participants experienced in general. The questionnaire consists of two subscales representing 10 positive and 10 negative affective states. Each adjective represents an emotion and participants report how much they have been feeling that way in general using a 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*totally*). The

positive affect (α = .89) and negative affect (α = .91) subscales showed good internal consistency.

Sport Achievement. Sport achievement was assessed with the three subscales from the Attainment of Sport Achievement Goal Scale (A-SAGS; Gaudreau et al., 2002). The A-SAGS is a 16-item scale that comprises three subscales measuring three theoretically driven criteria of goal attainment: Mastery (e.g., athletes that execute their movements correctly), self-referenced (e.g., athletes that perceive they accomplished one of their best performances of the season), and normative (e.g., athletes that perceive that their performance showed that they are superior to other athletes). Participants are asked to evaluate the extent to which 16 items correspond to their level of sport performance during the last six months on a 6-point Likert-type scale ranging from 1 (*not at all*) to 6 (*very strongly agree*). An aggregate score can be used to create a global index of goal attainment (e.g., Gaudreau et al., 2016). The scale had excellent internal consistency (α = .95).

Stress at School and in Sports. Two scales inspired by the stress thermometer (Kowalski & Crocker, 2001) evaluated the total level of subjective stress experienced by an individual at school and also in sports. Participants were asked to report a percentage that reflected how much stress they experienced during the past six months in their sport and at school, respectively. They rated their level of stress on a 100-point scale ranging from 0 (no stress) to 100 (most stress ever experienced).

School and Sport Drop-out intentions. Drop-out intentions in the context of school were measured by using three items. The first two items ("I am thinking of quitting school" and "I sometimes think about quitting school") were taken from The Drop-Out Intention Measure (Vallerand et al., 1997). The third item ("Every year, I wonder if I will continue my studies")

was taken from the work of Milyavskaya et al. (2009). The same three items were adapted for this study to evaluate drop-out intentions in the sport context but substituting the word "school" with "sport". Participants assessed each item on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The sport (α = .94) and school (α = .88) dropout measures showed good internal consistency.

Sport Burnout. The Athlete Burnout Questionnaire (ABQ) was used to measure sport burnout (Raedeke & Smith, 2001). This scale consists of three 5-item subscales measuring emotional/physical exhaustion (e.g., "I feel overly tired from participation in my sport"), reduced sense of accomplishment (e.g., "I am not achieving much in my sport"), and sport devaluation (e.g., "I'm not into my sport like I used to be"). The subscales can also be combined to create a total score of burnout (Hill, 2013). Participants indicated how they felt about their sport in the past six months using a 5-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). The internal consistency of this measure was good (α = .91).

Results

Preliminary Analyses on the SSBS

An Exploratory Factor Analysis (EFA) was conducted to reduce the initial pool of items of the School-Sport Balance Scale. Principal Axis Factoring using a varimax rotation in SPSS (version 25) was conducted on the 54 items of the initial SSBS. A four-factor solution was directly requested to the EFA given our theorized 4-factor model. The initial factor solution for this EFA is reported in Table 1. Thirteen items loaded on Factor 1 (sport-to-school conflict) and fourteen items loaded on Factor 2 (school-to-sport conflict). Fifteen items loaded onto Factor 3 (sport-to-school facilitation) and fourteen items loaded on Factor 4 (school-to-sport facilitation).

As reported in Table 1, items 36, 37, and 40 had cross loadings, namely with both Factors 3 and 4.

To determine the final pool of items for the scale, we used a theory-driven approach and reviewed the results from the initial EFA. Three items were retained to become indicators for each of the four dimensions of the SSBS in order for a 12-item scale to be short and parsimonious. The items that were kept were those that combined good factor loading and good content validity. We therefore kept items that had high loadings, but also those with the most compelling content validity for each of the four posited factors of school-sport balance. In fact, as Table 1 indicates, some items were retained despite having factor loadings that were lower than others because they had greater conceptual breadth (i.e., anchor items and items that represented the definition of conflict and facilitation). It was also important to prioritize items that we had initially developed as anchors for each subscale. The final SSBS contains 12 items (3 items per subscale; see appendix A) and EFA loadings for these 12 items ranged from .65 to .83. (see Table 1).

Internal Consistency

Cronbach alpha coefficients were calculated to evaluate the internal consistency of the SSBS and each of its subscales. The internal consistency was found to be good for all four subscales: *Sport-to-school conflict* ($\alpha = .91$), *school-to-sport conflict* ($\alpha = .88$), *sport-to-school facilitation* ($\alpha = .80$), and *school-to-sport facilitation* ($\alpha = .82$).

Confirmatory Factor Analysis

The factorial structure of the SSBS was tested through confirmatory factor analyses (CFA) using the Mplus software (version 8.0) with the maximum likelihood robust (MLR) estimator (Muthén & Muthén, 2012). To evaluate the fit of the factorial models, the following fit

indices and cut-off values were used. A value of less than 0.08 for the root mean square of approximation (RMSEA) indicates an adequate model fit, whereas values below 0.06 indicate excellent fit. For the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), values above 0.90 demonstrate good fit while values above .95 represent excellent fit (Hooper et al., 2008; Hu & Bentler, 1995).

We first tested a four-factor solution that considers four latent factors in which school-sport balance can be characterized by (1) sport-to-school conflict, (2) school-to-sport conflict, (3) sport-to-school facilitation, and (4) school-to-sport facilitation. As presented in Figure 1, the four-factor model also revealed good fit to the data. All standardized factor loadings were significant (ranging from .65 to .94) and goodness of fit indices showed satisfying fit to the data $\chi^2(48, n=105) = 53.82$, $p = .26$; CFI = .99; TLI = .99; RMSEA = .03 (90% CI [.00, .08]). As seen in Figure 1, sport-to-school conflict and school-to-sport conflict shared a nearly large correlation ($r = .44$) as well as sport-to-school facilitation and school-to-sport facilitation ($r = .40$). Unexpectedly, sport-to-school facilitation and school-to-sport conflict shared a small-to-medium correlation ($r = .28$), while sport-to-school facilitation and school-to-sport conflict also shared a small-to-medium correlation ($r = .30$). The other intercorrelations were not significant. No modification indexes were suggested to improve the fit of the model.

As showed in Figure 1, the results for the hypothesized higher-order factorial structure (Model 2) at first seemed to reveal good indices of fit: χ^2 (149, N=105) = 61.18, $p = .11$; CFI =.98; TLI =.97; RMSEA = .05 (90% CI [.00, .08]). Factor loadings for factors 1 to 4 (i.e., sport-to-school conflict, school-to-sport conflict, sport-to-school facilitation, school-to-sport facilitation) were all significant and ranged from .64 to .94. However, the higher-order factor loadings were not significant. Moreover, it is very important to note that the 2-factor solution of

the higher-order CFA is probably not reliable for at least two reasons. First, the error variance was negative for the school-to-sport conflict factor (i.e., potential Heywood case). Second, interference had a nonsensical higher-order loading because it was greater than 1. These were major issues and therefore it was deemed that the results of our higher-order factor CFA could not be interpreted. These technical issues were probably the result of having a small sample, but also higher-order factors that only had two lower-order indicators, respectively. Indeed, according to Kline (2016), among other causes, nonsensical estimates can occur when testing a latent model with only two indicators per latent variable with a small sample. In sum, this suboptimal scenario seems to fit the context in which we had attempted to test our higher-order CFA.

Correlations with the Nomological Network

Table 3 reports the correlations between the four dimensions of school-sport balance and developmental correlates in the nomological network, which covered personality, motivation, mental health, wellbeing, as well as sport and school adjustment. It was decided that the four factors of the School-Sport Balance Scale (SSBS) would be used to examine these correlations. This decision was deemed the most appropriate because of two reasons. First, substantively, the four-factor solution is much closer to previous theoretical work positing four factors (e.g., Frone, 2003). Second, psychometrically, given that the higher-order CFA was not reliable, we did not have an empirical argument for also using a 2-factor solution for the SSBS.

Sport-to-school conflict was linked to some detrimental correlates: Less conscientiousness, more controlled motivation in sport, and more athletic burnout. However, sport-to-school conflict was not associated with most of the developmental variables of the nomological network.

School-to-sport conflict was also associated with some detrimental correlates: Less openness to new experiences, and more controlled motivation in sport. However, school-to-sport conflict was also related to more autonomous motivation in sport which is often considered as a putative developmental benefit. Nonetheless, school-to-sport conflict was not associated with the majority of the developmental correlates in the nomological network.

Sport-to-school facilitation was associated with many beneficial correlates: More conscientiousness, more sport achievement, more autonomous motivation in sport and at school, more positive affect, and less sport dropout. Surprisingly, sport-to-school facilitation was also associated with more controlled motivation in school, which is considered as a detrimental outcome. That said, sport-to-school facilitation did not have any other relationships with the other variables of the nomological network.

School-to-sport facilitation was only associated with a few beneficial and detrimental correlates: More autonomous motivation in school and yet also more controlled motivation in sports, and more positive affect. By and large, school-to-sport facilitation was not associated with most of the developmental correlates in the nomological network.

Discussion

This study strived to broaden our current understanding on the perception of balance between academic and sport domains among undergraduate student-athletes between the ages of 17 and 25 years. To this end, the objective of this study was to develop a new measure called the School-Sport Balance Scale (SSBS), which was mainly based on the framework of role theory. We tested the preliminary validation of SSBS in terms of content validity, factorial validity, internal consistency, and a nomological network of developmental correlates consisting of personality, motivation, mental health, wellbeing, as well as sport and school adjustment.

Validation of the School-Sport Scale

Our first hypothesis was that there can be a *bidirectional influence* between school and sport demands, namely a school to sport influence and a sport to school influence. Factorial validity was tested to examine a possible 4-factor structure that can capture such bidirectional influence through university student-athletes' self-reports on the SSBS: (1) school-to-sport facilitation, (2) sport-to-school facilitation, (3) school-to-sport conflict, and (4) sport-to-school conflict.

Four Factors for the SSBS

The initial SSBS consisted of 54 items; however, to develop a more parsimonious scale we retained 12 items. The choice of items was both theory-driven to maintain content validity and based on factor loadings from a preliminary exploratory factor analysis (EFA). Results from CFA supported that the 12-item SSBS could be structured by four factors measuring four different aspects of school-sport balance : (1) school-to-sport facilitation, (2) sport-to-school facilitation, (3) school-to-sport conflict, and (4) sport-to-school conflict. Hence, the presence of these four factors support our first hypothesis that there can be a possible *bidirectional* influence between school and sport demands. These results are also compatible with prior theorization on work and family roles in organizational psychology (Frone, 2003). This four-factor structure is also in line with prior theorization arguing that work-to-family and family-to-work (Greenhaus & Beutell, 1985), as well as sport-to-school and school-to-sport (Boiché & Sarrazin, 2007) are distinct constructs. The four factors of the SSBS can be used as four subscales that have good internal consistency, which was evidenced by their satisfying Cronbach's alphas. However, there appears to be positive interrelations between some of the conflict and facilitation factors, which are very surprising and intriguing. Indeed, in the four-factor structure, two unexpected

correlations were present in that school-to-sport conflict was associated with (a) sport-to-school facilitation and (b) school-to-sport facilitation. This unexpected result may suggest that many university student-athletes will inevitably experience some school-related detriments when acquiring benefits from sport participation at university. In other words, when the present participants experienced facilitation between school and sports they inevitably experienced some degree of conflict between school and sports. Therefore, perhaps the name of the game for young university student-athletes is to make sure that the developmental benefits of their dual engagement in sports and academics will largely and sustainably outweigh the inevitable costs of investing time and energy across two life domains.

Two Higher Order Factors for the SSBS

Our second hypothesis was that there may also be *two overarching dimensions*, independent of each other, and that subsume the bidirectional influences between school and sport demands, namely synergy and interference. Unfortunately, our results for the higher-order CFA were not reliable and interpretable because of nonsensical estimates. As mentioned earlier in the results section, these nonsensical estimates were probably the result of using a small sample to test a higher-order CFA with higher-order factors that only had two lower-order indicators each. Therefore, the higher-order structure of the SSBS remains an open question for future research.

School-Sport Balance and Developmental Correlates

Our third hypothesis was that school-sport balance is associated with *developmental benefits and detriments*. More specifically, school-sport facilitation and sport-school facilitation should be associated with beneficial correlates, whereas school-sport conflict and sport-school conflict should be related to detrimental correlates. Overall, our results somewhat supported this

assumption, but as we will discuss, there were also important exceptions that need to be further studied.

Sport-to-School Conflict: When Sport is Perceived as Obstructing School

Sport-to-school conflict is when student-athletes perceive their sport as obstructing their academic activities. Our results indicated that school-to-school conflict was associated with a few detrimental correlates (17% of hypotheses were supported). We found that sport-to-school conflict was related to lower levels of trait conscientiousness. This result seems compatible with research in organizational psychology, as work-family conflict has also been shown to be linked to less conscientiousness (Allen et al., 2012; Wayne et al., 2004). Previous findings in sport psychology have also shown that high-level athletes are more conscientious (Allen et al., 2013; Steca et al., 2018) than lower-level athletes and non-athletes. It seems plausible that student-athletes who are less conscientious might have a personality that may lack the organization skills and discipline (e.g., time management) that are useful to prevent conflict between their athletic demands and academic responsibilities. Moreover, our study's findings suggested that student-athletes who perceive that their sport participation is hindering their academic life also perceive more athletic burnout. These findings are consistent with prior research in organizational psychology showing that conflict between family and work domains is related to more burnout (Allen et al., 2000). A recent review of the literature examining school-work-life interface among university students revealed that work-school conflict has been consistently associated with various indicators of impaired psychological health (Choo et al., 2019). Our results also showed that student-athletes who perceived more sport-to-school conflict tended to report that they participated in sport for controlled motives. These findings are somewhat consistent with prior studies that found that autonomous motivation for education was negatively associated with

conflicts between school and interpersonal relationships (Senécal et al., 2003), school and leisure (Ratelle et al., 2005), and sport and school (Boiché & Sarrazin, 2007). In other words, students who did sports for reasons that were more extrinsic (e.g., social pressure) also tended to see sports as hindering their academic life.

School-to-Sport Conflict: When School is Perceived as Obstructing Sport

School-to-sport conflict is when university student-athletes perceive school as obstructing their sport activities and this was associated with some detrimental correlates, but it was not associated with most of the developmental correlates in the nomological network (11% of hypotheses were supported). More specifically, school-to-sport conflict was associated with lower levels on the trait of openness to experience. The literature in sport psychology has documented that athletes have higher levels of openness (Steca et al., 2018), however, it has not specifically examined the level of openness in university student-athlete nor has it looked at the association between openness and school-sport conflict. In organizational psychology, the literature on role conflict and openness is scarce. Thus far, studies have indicated that openness is not related to neither work-family conflict nor family-work conflict (Mihelic, & Tekavcic, 2014; Wayne et al., 2004). Our finding is possibly different from these studies as they were focused on work and family domains that are not typical of everyday life in university student-athletes. Overall, it can be noted that being higher in openness is usually tied with having intellectual interests (Goldberg, 1990). As such, university student-athletes who are low in openness may not have as much interest for academic activities and, at least for some of them who are also into sports, it could be that school-related activities can even be perceive as a nuisance to their sport-related interests. School-to-sport conflict was also related to controlled sport motivation. As discussed above, this result is somewhat consistent with the literature

showing that autonomous motivation for education is associated with less inter-role conflicts (Boiché & Sarrazin, 2007; Ratelle et al., 2005; Senécal et al., 2003). Therefore, mirroring results for sport-to-school conflict, participants who engaged in sports for reasons that are more extrinsic also tended to see school as an obstacle to their athletic life. Lastly, our findings showed that when student-athletes experienced school-to-sport conflict, they also reported more autonomous motivation in sport. These results are incompatible with prior findings on motivational interference as they also revealed that more autonomous sport motivation was positively associated with less interference between two important life domains (e.g., Senécal et al., 2001). More research is needed to better understand this paradoxical finding as to why both autonomous and controlled athletic motives are concurrently related to school-to-sport conflict. That being said, other studies have observed surprising links between motivation and school-sport conflict in that sport autonomous motivation predicted more interference between school and sport domains (e.g., Boiché et al., 2015; Boiché & Sarrazin, 2007). It is possible that athletes in our sample perceived that school is mandatory and that it takes up more time and energy that it should because of their interest and involvement in sports. They might perceive that their sport is more important to them than school.

Sport-to-School Facilitation: When Sport is Perceived as Helping School

Sport-to-school facilitation is when student-athletes perceive sport as helping their school activities and this was generally associated with many beneficial correlates (33% of hypotheses were supported). Sport-to-school facilitation was related to more trait conscientiousness. As seen above with sport-to-school conflict but in the opposite direction, this result is consistent with prior research (Allen et al., 2012, 2013; Baltes et al., 2011; Steca et al., 2018). We found that sport-to-school facilitation was tied with sport performance, which is compatible with previous

studies in organizational psychology that have demonstrated that work-life balance has a significant influence on the performance of employees (Kim, 2014; Magnini, 2009). Research in the educational context has also found similar findings showing that work-school facilitation was related with better school performance (Butler, 2007) and more academic dedication (Creed et al., 2015). Similarly, athletes interviewed in Aquilina's (2013) study highlighted that they had greater performances in their sport when they were able to reach balance within domains outside of their sport environment. Sport-to-school facilitation was also associated with more positive affect. This is consistent with the literature suggesting that positive affect may prevent individuals from experiencing conflicts between their work and family demands (Allen et al., 2012). Likewise, research has shown that experiencing more conflict between their school and sport roles among student-athletes can reduce well-being (Dubuc-Charbonneau & Durand-Bush, 2015). Overall, it is known that having a more positive affect is associated with having a more positive attitude toward things in general (Hepler & Albarracín, 2013). As such, it is possible that those university students who had greater positive emotionality may have had a more positive attitude towards being engaged in multiple activities, which in turn may explain why they could perceive more facilitation between sport and school. Finally, our results indicated that sport-to-school facilitation was associated with both sport and school autonomous motivation, which is in line with prior research (Boiché & Sarrazin, 2007; Ratelle et al., 2005; Senécal et al., 2003). Hence, university students who perceived that their sport activities provided resources that could be transferred to their school activities also engaged in both of these domains for reasons that are more intrinsic. However, surprisingly, sport-to-school facilitation is also related with school controlled motivation. Therefore, the more university student-athletes perceived that their sport enriches their academic experience, the more they engaged in school for extrinsic reasons.

Nonetheless, for example, it might be plausible that some high-level athletes attend university for instrumental reasons or as a 'plan b' because they want to continue to perform in high performance sports (e.g., university football or hockey team) or because they know that they must acquire a second career when their sport career will be finished. One study that examined levels of motivation in school found that students who had profiles of high autonomous and high controlled motivation towards school reported the greatest level of academic adjustment (Ratelle et al., 2007). It could be possible that in the context of school-sport balance experiencing both forms of motivation could also lead to positive outcomes and that it is less detrimental than when athletes only experience controlled motivation. Lastly, sport-to-school facilitation is related to less intentions to drop out of sports. However, studies that have examined work-study facilitation did not find an association between work-study facilitation and dropout intentions (Taylor et al., 2012). Nonetheless, in sport psychology, perceived conflict between sport and other meaningful contexts (sport-school conflict and sport-friendship conflict) was identified as a relevant factor in sport dropout (Boiché & Sarrazin, 2007). Accordingly, the more athletes perceived conflict between their activities, the less they were committed and persisted in their sport (Boiché & Sarrazin, 2007; Guillet et al., 2002). Perhaps university student-athletes who are more committed to persist in their sports also tend to perceive that devoting time to and energy in their sport activities is worth the investment and that it can even benefit their concurrent academic activities.

School-to-Sport Facilitation: When School is Perceived as Helping Sport

School-to-sport facilitation is when student-athletes perceive that school is helping their sport activities and this was associated with few of the developmental correlates in the nomological network (11% of hypotheses were supported). School-to-sport facilitation was

associated with greater school autonomous motivation. Hence, when university students perceived that school facilitated their sport activities, they also reported being at school for more intrinsic reasons. However, surprisingly, school-to-sport facilitation was also associated with sport controlled motivation. In other words, the more university student-athletes perceived that their academic experiences enhanced their sport experiences, the more they engaged in sport for extrinsic reasons. These results are inconsistent with previous findings on motivational interference given that prior research has showed a negative relationship between controlled motivation and facilitation between two life domains (e.g., Boiché et al., 2015; Boiché & Sarrazin, 2007; Senécal et al., 2003). As much as these results seem paradoxical, research examining self-determination motivation has identified that controlled motivation is not always associated with negative outcomes (Gillet et al., 2012). High-level athletes might have more controlled reasons for doing their sports. For instance, they might want to outperform their opponents or receive acceptance from their coach and teammates. Lastly, school-to-sport facilitation was also related to having a more positive affect. Similarly to sport-to-school facilitation, this finding is in line with the literature (Allen et al., 2012; Dubuc-Charbonneau & Durand-Bush, 2015). Again, it is conceivable that those university student-athletes who had more positive emotionality may have held more positive attitude towards being engaged in both academic and sports activities, which may have increased their perception of facilitation between both domains.

Limitations

This study is a first attempt to conduct a preliminary validation of the School-Sport Balance Scale (SSBS). However, as for any initial research endeavour, notable limitations must be mentioned. First, although our sample focused on university student-athletes, the sample size

was small and the average hours that student-athletes spent doing their sports was limited to 10.61 hours weekly. Future research should continue to evaluate the psychometric proprieties of the SSBS with a larger sample of student-athletes who dedicate more hours to their sport. Second, our validation consisted of only one sample. Forthcoming studies should try to replicate the SSBS's results across different samples. Although some studies have validated scales using only one sample (e.g., Blais-Rochette & Miranda, 2016; Ryba et al., 2017), it is much better to replicate results with another sample when developing a measurement tool. Third, it will be important that future studies test alternative models and compare their fit to the four-factor model of SSBS. For example, future work could test if school-sport balance could be structured by one-factor or a two-factor model. Fourth, it is important to note that given our small sample size we lacked statistical power to conduct the higher-order CFA. It was not possible to answer our hypothesis that SSBS could have two overarching dimensions independent of each other (i.e., synergy and interference). Also, another important limitation to be discussed is that we conducted both an EFA and CFA with the same sample. Given that our CFA was not conducted on new data from an independent sample we cannot say that we used this statistical technique in a confirmatory fashion *per se*, but rather as an exploratory technique. Therefore, the validation of the SBSS is a preliminary validation and it will be important that further research validate this tool in other samples of university student-athletes. Fifth, the design of this study was cross-sectional and therefore the relationship between the SSBS and any given developmental correlate remains bivariate. In other words, it was not possible to conclude if the SSBS could predict the correlate or if the correlate itself could predict the SSBS. Hence, future studies using the SSBS should examine predictive associations with a longitudinal design. Sixth, only self-report measures were used, although they can be

susceptible to recall bias and social desirability. Future research should accompany self-reports with observational reports (e.g., from peers, teammates, coaches) to triangulate findings. Sixth, surprisingly, stress was not associated with any dimensions of the school-sport balance. It is possible that the instrument used to measure perceived stress was not optimal. Future research should revisit what measure to us to adequately assess stress (e.g., cortisol levels, perceived stress scale). Finally, although overall the SSBS was associated with some important developmental correlates, each subscale was not associated with many correlates. Therefore, future studies should focus their attention on examining fewer correlates of the nomological network tested in this article. They should also explore the links between the SSBS and other possible developmental outcomes (e.g., self-esteem, self-efficacy, GPA, motivational climate).

Conclusion

The preliminary psychometric properties of the SSBS are encouraging but more research is needed, notably to identify a potential higher order structure and to replicate the validation with at least another sample of university student-athletes. Our research findings also provide preliminary evidence for the utility of using a role theory framework to better understand the perception that university student-athletes have of school-sport balance. Overall, this study suggests that there might be both developmental benefits and costs for athletes who attend university.

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Table 1. Loadings from Exploratory Factor Analysis (EFA) for the School-Sport Balance Scale

Items	Items	F1	F2	F3	F4
I can't give my 100% in school because I am too involved in sports.	Item 1	.66			
I could achieve more at school if I spent less time in sports.	Item 2	.69			
I am often tired when I am in class because of my involvement in sports.	Item 3	.76			
My sport interferes with my school (e.g., school work, studying).	**Item 4**	**.81**			
Sports conflicts with school.	**Item 5**	**.76**			
Sports keeps me from studying and doing my school work.	**Item 6**	**.79**			
I missed important material in class because of sports.	Item 7	.76			
I didn't do well during some exams because of sports.	Item 8	.71			
Sport is often my priority even though it should be school.	Item 9	.60			
I often study at the last minute because of sports.	Item 10	.74			
I often hand in my school work late because of sports.	Item 11	.50			
After a practice, I am often too exhausted to study or do my school work.	Item 12	.65			
When I am at university, I can't stop thinking about sports.	Item13	.50			
When I have a bad day in sports, I am in a bad mood at school	Item 14	> .40			
I can't give my 100% in sports because I am too involved in school.	Item 15		.69		
I could achieve more in sports if I spent less time in school.	Item 16		.68		
I am often tired when in sports because of my involvement in school.	Item 17		.68		
My school work interferes with sports.	**Item 18**		**.77**		
School conflicts with sports.	**Item 19**		**.65**		
School work keeps me from doing sports as much as I wished.	**Item 20**		**.71**		
Thinking about school during sports keeps me from concentrating in sports.	Item 21		.42		
I missed sport practices or competitions because of school.	Item 22		.47		
I often have a hard time replacing my sport practices because of school.	Item 23		.73		
I often choose to study or do school work even though I should be doing sports.	Item 24		.49		
I am often late for sports because I had to do school work or study.	Item 25		.54		
After a day at school, I am often too exhausted to do sports.	Item 26		.62		
When I am doing sports, I can't stop thinking about school.	Item 27		.44		
When I have a bad day at school, I am in a bad mood in sports.	Item 28		.42		
A good day in my sports, inspires me to do my school work or study.	Item 29				.53
I am in a good mood at school because of sports.	Item 30				.68
I have more energy at school because of sports.	Item 31				.63
I can use the skills I learned in sports at school.	Item 32				.55
The things I do in sports make me a more interesting person at school	Item 33				.73

Table 1. (Continued)

Items		F1	F2	F3	F4
My experience in sports gives me a more positive attitude for school.	**Item 34**				**.76**
My sport helps me succeed more effectively at school.	**Item 35**				**.83**
The things I learn in sports completes effectively the things I learn at school.	Item 36			.43	.66
I can manage more effectively my sport schedule because of the discipline I learned in school	Item 37			.40	.58
I manage my time more effectively at school because of what I learned in sports.	**Item 38**				**.65**
I learn more quickly at school because of what I learned in sports.	Item 39				.63
I am more effective when I do my school work or study when I am able to help people that need my support in sports.	Item 40			.42	.51
I complete my school work more quickly and I need to study less to have good marks because of the interpersonal skills I learned in sports.	Item 41			.41	
A good day at school, inspires me to do have a good sport practice.	Item 42				.52
I am in a good mood in sports because of school	Item 43			.52	
I have more energy in sports because of school.	Item 44			.71	
I can use the skills I learned at school in sports.	Item 45			.65	
The things I do at school make me a more interesting person in sports.	Item 46			.64	
I have a more positive attitude in sports because of my school experiences.	**Item 47**			**.66**	
School helps me succeed more effectively in sports.	**Item 48**			**.77**	
The things I learn at school completes effectively the things I learn in sports.	**Item 49**			**.74**	
I can manage more effectively my school schedule because of the discipline I learned in sports.	Item 50				.53
I manage my time more effectively in sports because of what I learned at school.	Item 51			.59	
I learn more quickly in sports because of what I learned at school.	Item 52			.69	
I am more effective in my sports when I am able to help people that need my support in school.	Item 53			.70	
I complete my sport obligations more quickly and I obtain better sport performances because of the interpersonal skills I learned at school.	Item 54			.59	

Note. N=105. Only loadings > .40 are reported and loadings in bold are items that have been retained for the SSBS. Factor 1 represents Sport-School Conflict, Factor 2 represents School-Sport Conflict, Factor 3 represents Sport-School Facilitation and Factor 4 represents School-Sport Facilitation.

Table 2. Descriptive Statistics (Means and Standard Deviations) of all Variables

	Range	*M*	*SD*
SSBS			
Sport-School Conflict	1-5	2.71	1.00
School-Sport Conflict	1-5	2.90	1.07
Sport-School Facilitation	1-5	3.42	.92
School-Sport Facilitation	1-5	2.89	.93
Personality			
Emotional Stability	1-7	4.71	1.32
Openness	1-7	5.00	1.08
Conscientiousness	1-7	5.15	1.17
Extraversion	1-7	4.41	1.40
Agreeableness	1-7	4.58	1.10
Motivation			
Sport Autonomous Motivation	1-7	4.65	1.20
Sport Controlled Motivation	1-7	3.48	1.04
School Autonomous Motivation	1-7	4.30	1.03
School Controlled Motivation	1-7	4.12	0.82
Mental Health			
Internalizing Symptoms	1-5	2.45	0.83
Well-Being			
Burnout	1-5	2.50	0.70
Positive Affect	1-5	3.56	0.73
Negative Affect	1-5	2.48	0.84
School and Sport Adjustment			
Sport Dropout	1-5	2.18	1.13
School Dropout	1-5	1.94	1.00
Sport Stress	0-100	50.00	25.17
School Stress	0-100	72.40	20.60
Sport Achievement	1-6	3.63	.95

Note. N=105. SSBS: School-Sport Balance Scale.

Table 3. Inter-correlations among school-sport balance dimensions.

	1	2	3	4
1. Sport-School Conflict	---			
2. School-Sport Conflict	.40**	---		
3. Sport-School Facilitation	-.06	.26**	---	
4. School-Sport Facilitation	.19*	.25*	.38**	---

Note. N=105. Pearson Correlations. * $p < .05$. ** $p < .01$

Table 4. Correlations Among the Four Dimensions of the SSBS and Developmental Correlates.

	Sport- School Conflict	School-Sport Conflict	Sport-School Facilitation	School-Sport Facilitation
Sport Stress	.09	-.14	.05	-.15
School Stress	-.18	.04	.03	-.08
Emotional Stability	-.19	.04	.17	.05
Openness	-.12	-.27**	.15	-.00
Conscientiousness	-.23*	-.05	.20*	.01
Extraversion	-.01	-.11	.16	.02
Agreeableness	-.18	-.02	-.03	.13
Internalizing symptoms	.14	.02	-.14	.04
Sport achievement	.18	.17	.25*	.01
SPAM	.13	.22*	.35**	.17
SPCM	.37**	.25*	-.04	.26**
SCAM	.05	-.06	.32**	.31**
SCCM	.14	.10	.25**	.09
Positive Affect	.02	.07	.32**	.20*
Negative Affect	.15	.09	.16	.17
Sport Dropout	.10	.03	-.22*	.10
School Dropout	.15	.09	-.11	-.13
Sport Burnout	.31**	.15	-.11	.13

Note. $N = 105$. Pearson Correlations * $p < .05$. ** $p < .01$.
Sport Autonomous Motivation (SPAM); Sport Controlled Motivation (SPCM); School Autonomous Motivation (SCAM); and School Controlled Motivation (SCCM).

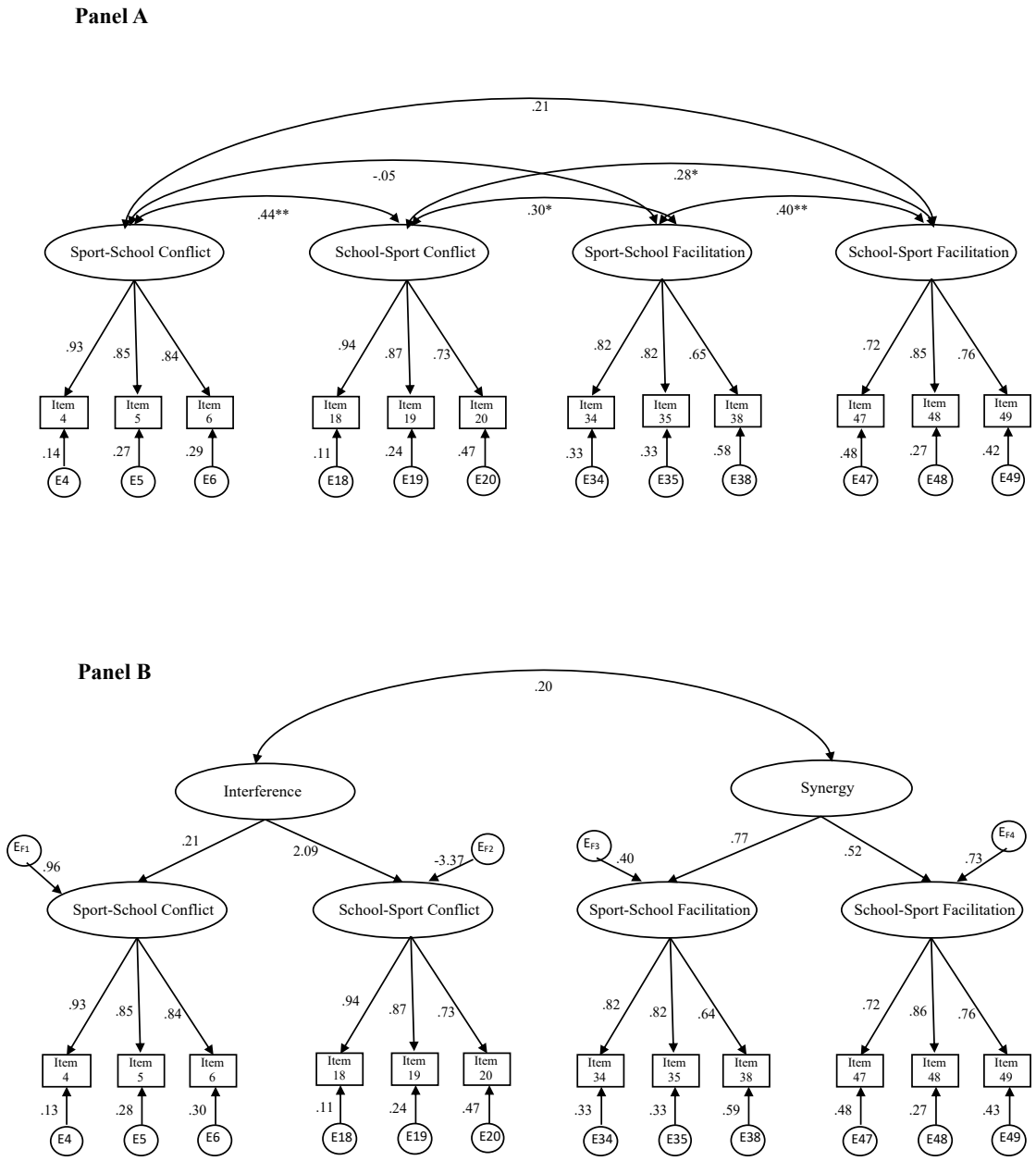

Figure 1. Results of confirmatory analyses on the SSBS for the four-factor structure (Panel A) and the higher-order structure (Panel)

Appendix A. Final 12-Item Version of the School-Sport Balance Scale (SSBS)

Sport-School Conflict
My sport interferes with my school (e.g., school work, studying)
Sports conflict with school
Sports keep me from studying and doing my school work
School-Sport Conflict
My school work interferes with sports
School conflicts with sports
School work keeps me from doing sports as much as I wished
Sport-School Facilitation
My sport helps me succeed more effectively at school
My experience in sports gives me a more positive attitude for school
I manage my time more effectively at school because of what I learned in sports.
School-Sport Facilitation
School helps me succeed more effectively in sports
I have a more positive attitude in sports because of my school experiences
The things I learn at school completes effectively the things I learn in sports

Note. Authors give permission to use the scale for research and educational purposes.

CHAPTER 3 : School-Sport Balance among University Student-Athletes: Identifying Potential Motivational Antecedents and Mental Health Outcomes

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Abstract

Recently, school-sport balance has been proposed as a multidimensional construct to capture the perception that university student-athletes have of the interplay between their academic and athletic demands (Morinville & Miranda, 2020). However, very little is known about the potential antecedents and consequences of school-sport balance. The main objective of this study is to better understand how motivation may shape school-sport balance, which itself may first impact stress, and then mental health. We therefore tested serial mediation models, in which autonomous and controlled motivation (school and sport) may shape school-sport balance (school-sport facilitation, sport-school facilitation, school-sport conflict, and sport-school conflict), which in turn may influence stress (school and sport) to finally impact mental health (depression and anxiety symptoms). We also treated autonomous and controlled motivation (school and sport) as mutual covariates when testing one or the other. The sample was composed of 193 undergraduate university student-athletes who were aged between 17 and 25 years old. Overall, four serial mediation models revealed that school-sport balance is not a mediator within the relationships between motivation, stress, and mental health. Results revealed a number of paths through which motivation may partially shape school-sport balance. Moreover, sport-school conflict was associated with more sport stress, while school-sport conflict was associated with poorer mental health. However, when school motivation and school stress were considered, school-sport balance did not predict neither stress or mental health issues. Therefore, in terms of school-sport balance, the mental health of university student-athletes might be more specifically affected by the perception that academic duties obstruct sport participation.

Keywords: school-sport balance, motivation, school, sport, stress, and mental health

School-Sport Balance among University Student-Athletes: Identifying Possible Motivational Antecedents and Mental Health Outcomes

University student-athletes are faced with the same developmental tasks and life challenges as their non-athlete peers during emerging adulthood (e.g., autonomy, responsibilities). However, they are also required to be motivated enough to find ways to conciliate their academic and athletic responsibilities. In turn, they may perceive stress from the fact that these concurrent demands are incompatible with each other, which could then affect their mental health. Recently, school-sport balance has been proposed as a multidimensional construct to capture the perception that university student-athletes have of the compatibility/incompatibility between their academic and athletic demands (Morinville & Miranda, 2020). However, very little is known about the potential antecedents and consequences of school-sport balance. The main objective of this study is to better understand how motivation may shape school-sport balance, which itself may first impact stress, and then mental health. More specifically, we tested serial mediation models, in which autonomous and controlled motivation (school and sport) may shape school-sport balance (school-sport facilitation, sport-school facilitation, school-sport conflict, and sport-school conflict), which in turn may impact stress (school and sport) to finally impact mental health (depression and anxiety symptoms).

Our study is also timely given that psychological health has become a major concern in the university student population (American College Health Association [ACHA] 2016), including university student-athletes (Neal et al., 2013; Van Slingerland et al., 2018). However, research on mental health among student-athletes remains limited (Sullivan et al. 2019; Van Slingerland et al., 2018). Therefore, this study attempts to contribute in addressing this research caveat.

School-Sport Balance

Morinville and Miranda (2020) recently developed the multidimensional construct of *school-sport balance* to examine the perception that student athletes have of balance between their academic and athletic demands at university. They conducted a confirmatory factor analysis, which supported the notion that school-sport balance has four dimensions: (1) school-sport facilitation, (2) sport-school facilitation, (3) school-sport conflict, and (4) sport-school conflict. First, they defined *school-sport facilitation* as school commitments offering resources that positively crossover to sport commitments. For instance, student-athletes may experience *school-to-sport facilitation* when a good mark on an exam translates into a more positive attitude during a subsequent athletic competition. Second, they defined *sport-school facilitation* as sport commitments offering resources that positively crossover to school commitments. For example, student-athletes may experience *sport-to-school facilitation* if time management skills in their sport helps them better organize their schoolwork. Third, they defined *school-sport conflict* as the interference of school demands with sport demands. For instance, a university student-athlete may spend extra time finishing an assignment instead of attending practice. Fourth, they defined *sport-school conflict* as the interference of sport demands with school demands. For example, university student-athletes who feel exhausted from an evening game or training may decide to skip class the next morning.

Morinville and Miranda (2020) also found that school-sport balance may be associated with some developmental benefits (e.g., autonomous motivation), but also some developmental costs (e.g., athletic burnout) among university student-athletes. First, sport-to-school conflict was mostly negative because it was associated with less conscientiousness, more controlled sport motivation, and more athletic burnout. Second, school-to-sport conflict was also mostly negative

as it was related to less openness to new experiences and more controlled sport motivation, yet surprisingly it was also linked to more autonomous sport motivation. Third, sport-to-school facilitation was mostly positive given that it was tied with more conscientiousness, more sport achievement, more autonomous motivation in sport and at school, more positive affect, and less sport dropout, but unexpectedly, it was also related to more controlled school motivation. Finally, school-to-sport facilitation was somewhat more positive because it was associated with more autonomous school motivation, more positive affect, and yet unexpectedly more controlled sport motivation. In sum, it is important to build on and extend these initial correlates by examining potential antecedents and consequences of school-sport balance.

Motivation as a Potential Antecedent of School-Sport Balance

Motivation is probably an important antecedent of school-sport balance because it may promote facilitation and reduce conflict. Generally, motivation offers a fundamental way to understand why individuals engage in activities. In this study, motivation is conceptualized through Self-Determination Theory (SDT; Ryan & Deci 2000, 2017), which provides a framework to better understand the reasons why university athletes engage in achievement-related activities, namely school and sports. According to SDT, individuals perform an activity for various reasons, which can be summarized by two broad dimensions: Autonomous motivation and controlled motivation (Ryan & Deci, 2000, 2017; Vallerand, 1997). On one hand, an individual can engage in an activity because of *autonomous motivation*. This signifies that they will participate in the activity by pure pleasure and in a voluntary way (Ryan & Deci, 2000). On the other hand, individuals can also engage in an activity because of *controlled motivation.* This type of motivation will be endorsed when the activity is done because of reasons that are external to their self (e.g., obtain rewards, avoid social pressure, guilt and shame; Ryan & Deci,

2000). A central premise of SDT is that individuals will experience less conflict when their life contexts are integrated within one's self (Ryan & Deci, 2000, 2002, 2017). As such, the more individuals engage in their different activities out of choice (i.e., autonomous motivation) the more their activities are coherent with their self. As a consequence, they should perceive less conflict and more facilitation between their concurrent activities. In contrast, when individuals perform their activities because of external pressure (i.e., controlled motivation) these activities are not authentically integrated within their self, and, in turn, individuals may perceive more conflict and less facilitation between their coexistent activities (Ryan & Deci, 2002).

Only a handful of studies have adopted SDT as a theoretical framework to examine interdomain conflict (e.g., Boiché et al., 2015; Boiché & Sarrazin, 2007; Healy et al., 2016; Ratelle et al., 2005; Senécal et al., 2001). Thus far, it should be noted that research findings are mixed. Some findings are mostly consistent with SDT. That is, conflict between two life domains was related to lower levels of autonomous motivation (e.g., Ratelle et al., 2005; Senécal et al., 2001, 2003). In particular, Healy et al. (2016) concluded that more adaptive profiles of motivation (i.e., more autonomous and less controlled motives) was related to more facilitation and less interference between academic and sport goals, compared to less adaptive profiles (i.e., moderate levels of both autonomous and controlled motives, as well as profiles with high controlled motives). Intriguingly, they also found that all profiles reported some moderate level of interference. Nevertheless, other findings have found more ambiguous outcomes. For example, one study indicated that autonomous motivation for leisure activities was unrelated to conflict between school and leisure (Ratelle et al., 2005). Moreover, other studies revealed that more autonomous sport motivation was linked with more school-to-sport conflict (Boiché et al., 2015; Boiché & Sarrazin, 2007). Overall, although there is no consensus in this literature, it still

suggests that motivation may at least partially shape the perception that student-athletes have of balance between school and sport at university. Hence, we submit the following hypotheses that are grounded in SDT:

Hypothesis 1a. We expect that higher levels of autonomous motivation (in either school or sport context) will be associated with less school-sport and sport-school conflicts, as well as with more school-sport and sport-school facilitation.

Hypothesis 1b. In contrast, we expect that higher levels of controlled motivation (in either sport or school context) will be related to more school-sport and sport-school conflicts, as well as to less school-sport and sport-school facilitation.

Stress and Mental Health as Potential Consequences of School-Sport Balance

Being a student-athlete can create a positive identity, improve self-esteem, and build confidence (Watt & Moore, 2001), as well as enhance psychological health (Armstrong et al., 2015). Nevertheless, the additional pressure that student-athletes must face when they attempt to reconcile their school and sport demands can also have a negative impact on their levels of stress and consequently their well-being and mental health (e.g., Cosh & Tully, 2015; Van Rens et al., 2016; Van Slingerland et al., 2018). Moreover, stress is well-known to be a risk factor that increases the likelihood of developing mental health issues (Cohen et al., 2007; Hammen, 2015; Shankar & Park, 2016).

School-Sport Balance and its Potential Impact on Stress

Thus far, studies have rarely examined the association between school-sport balance and stress among university student-athletes. Nonetheless, the transactional model of stress and coping (Lazarus and Folkman, 1984) can provide a theoretical basis to anticipate an association between school-sport balance and stress among university student-athletes. Notably, Lazarus and

Folkman (1984) theorized that stress results from the interaction between the person and the environment. Stress is experienced when an individual perceives that their resources are overwhelmed or exceeded (Lazarus & Folkman, 1984). For example, in the context of university student-athletes, they may be stressed when they perceive that reconciling school and sport demands exceeds their resources. Indeed, student-athletes report that strain related to their concurrent educational and athletic demands is an important source of stress in their lives (Cosh & Tully, 2015; Van Rens et al., 2016). Accordingly, student-athletes' school and sport role interference is associated with stress (Settles et al., 2002; van Rens et al., 2016). Lastly, a related example is that among graduate university students, work-school conflict is an antecedent of stress, while work-school facilitation is unrelated to stress (Nicklin et al., 2018). In sum, the above-mentioned studies suggest that stress may represent a potential consequence of school-sport balance, especially conflicts. Hence, research on stress allows us to propose the following hypotheses:

Hypothesis 2a. We expect that school-sport and sport-school conflicts will be associated with more perceived stress in either the school or sport contexts.

Hypothesis 2b. We anticipate that school-sport and sport-school facilitation will be linked with less perceived stress in either the school or sport contexts.

Mental Health as a Potential Outcome of School-Sport Balance and Stress

Many studies have examined balance among life domains in relation to various mental health indicators. In adults, findings have consistently demonstrated that resource depletion (i.e., role conflict) between work and family domains is related to poorer psychological health, whereas resource gain (i.e., role facilitation) is linked to better psychological functioning (e.g., Allen et al., 2000; Frone 2003; Gray et al., 2017; Riediger & Freund, 2004). Accordingly, a

recent meta-analysis considering important life goals showed that higher levels of goal conflict was associated with impaired psychological wellbeing (Gray et al., 2017). Moreover, two other meta-analyses have shown that work-family conflict was associated with more depression (Allen et al., 2000; Amstad et al., 2011).

Furthermore, a recent review examining the school-work-life interface among university students indicated that work-school conflict is consistently associated with impaired psychological health (Choo et al., 2019). In educational psychology, school-leisure conflict has also been associated to poorer psychological functioning in university students (i.e., more depression and less life satisfaction; Ratelle et al., 2005). At university, studies looking at the study-family interface also showed similar results. Specifically, findings showed that study-family conflict was a predictor of psychological distress, whereas study-family facilitation was related to more psychological health (Creed et al., 2015; McNall & Michel, 2017; Park & Sprung, 2013). In sport psychology, a study found that adult athletes (i.e., 18 to 56-year-olds) who experienced high levels of conflict between their sport and interpersonal relationships reported more depression (Jowett & Cramer, 2009). Likewise, in a sample of college student-athletes findings revealed that conflict between academics and athletics identities led to less psychological well-being (Settles et al., 2002). Based on these findings, it is conceivable that mental health may be a potential consequence of school-sport balance among student-athletes. Therefore, the bulk of findings in mental health research led us to suggest the following hypotheses:

Hypothesis 3a. We expected that school-sport and sport-school conflicts will be associated with poorer mental health (more depression and anxiety symptoms).

Hypothesis 3b. We expected that school-sport and sport-school facilitation will be associated with better mental health (less depression and anxiety symptoms).

Motivation, Stress, and Mental Health

Although our focus is on school-sport balance, this study also enables to have a broader outlook on whether the motivation of university student-athletes can play a role on their levels of stress and psychological health. SDT postulates that autonomous motivation is related to positive outcomes, whereas controlled motivation is associated with negative outcomes (e.g., Deci & Ryan, 2000, 2002; Vallerand, 1997). More specifically, it is said that autonomous motivation is more adaptive because this type of motivation means that the reasons for performing an activity is integrated with the self, which leads to positive outcomes and buffers the negative ones. In contrast, when individuals perform activities for controlled reasons, their motives for doing the activity are not compatible with their self, which can create intrapersonal conflict and negative consequences (Ryan & Deci, 2000; Healy et al., 2014). This theoretical assumption has been supported by several empirical studies that have focused on a variety of life domains, such as the educational and sport contexts (for reviews, see Ryan & Deci, 2000; Vallerand 1997).

In the educational context, studies have examined the link between academic motivation and stress within the framework of self-determination theory (e.g., Baker, 2004; Huang et al., 2016; Liu, 2015; Park et al., 2012). For the most part, among university students, findings indicated that autonomous motivation was associated with lower stress, whereas controlled motivation was linked to more stress (e.g., Baker, 2004; Huang et al., 2016; Liu, 2015; Park et al., 2012). Furthermore, there is also evidence suggesting that motivation is related to individuals' psychological functioning (Deci & Ryan, 2008; Healy et al., 2014; Vallerand, 1997). For instance, research has demonstrated that autonomous motivation is associated to better

performance, health, and well-being (Deci & Ryan, 2008; Healy et al., 2014; Weinstein & Ryan, 2011). We thereby anticipate that autonomous motivation and controlled motivation should be respectively tied with better and poorer mental health. Hence, based on the extant research on SDT, we put forward the following hypotheses:

Hypothesis 4a. We expect that autonomous motivation (in either school or sport contexts) will be associated with less stress at school or in sport.

Hypothesis 4b. We expect that controlled motivation (in either school or sport contexts) will be related to more stress at school or in sport.

Hypothesis 5a. We expect that autonomous motivation (in either school or sport contexts) will be associated with better mental health (less depression and anxiety symptoms).

Hypothesis 5b. We expect that controlled motivation (in either school or sport contexts) will be linked to poorer mental health (more depression and anxiety symptoms).

Lastly, given that stress is a well-established risk factor of developing impaired mental health (Cohen et al., 2007; Hammen, 2015; Shankar & Park, 2016), we propose the following hypothesis:

Hypothesis 6. We anticipate that perceived stress (in either school or sport contexts) will be associated with poorer mental health (more depression and anxiety symptoms).

The Present Study

This study is a first step towards better understanding the potential antecedents and consequences associated with school-sport balance in student-athletes at university. As shown in Figure 1, the goal of this study was to examine four serial mediation models that are informed by theory and research, in which motivation is associated to mental health, through school-sport balance and stress. We controlled for covariates (*autonomous motivation* when controlled

motivation was the independent variable; and conversely, *controlled motivation* when autonomous motivation was the independent variable). Specifically, as seen in Figure 1 (Panels A and C), the mediation models posit that autonomous motivation contributes to less of both sport-school and school-sport conflicts, which should lead to lower levels of stress (at school or in sport), which should itself lead to better mental health (less depression and anxiety symptoms). Also, as presented in Figure 1 (Panels A and C), we expect that autonomous motivation will be related to more sport-to-school and school-to-sport facilitation, which should be linked to less stress, and in turn, which itself should be associated with better mental health. In contrast, as illustrated in Figure 1 (Panels B and D), we anticipate that controlled motivation will be linked with more sport-school and school-sport conflicts, which should be related to more stress, which should itself be linked with poorer mental health. Lastly, as presented in Figure 1 (Panels B and D), we also posit that controlled motivation will be linked to less sport-to-school and school-to-sport facilitation, which should be related to more stress and subsequently to poorer mental health.

In terms of our hypotheses, as presented on the left side of Figure 1, autonomous and controlled motivation (either sport or school) are expected to be antecedents of the four dimensions of school-sport balance (*hypotheses 1a and 1b)*. Next, as shown on the right side of Figure 1, stress (either in sport or school; *hypotheses 2a and 2b*) and mental health (*hypotheses 3a and 3b)* should represent consequences of the four dimensions of school-sport balance. Moreover, Figure 1 also illustrates that autonomous and controlled motivation (either sport or school) are also antecedents of stress (*hypotheses 4a and 4b*) and mental health *(hypotheses 5a and 5b).* Finally, Figure 1 presents the expected relation between stress and more mental health problems (*hypothesis 6)*.

Method

Sample

When conducting our online survey, the initial sample consisted of 449 undergraduate students who attended a Canadian university. Given the focus of the study, we only kept participants aged between 17 and 25 years who were engaged in competitive sports during the last six months (n=314). Also, 114 participants completed a French version of the English survey. Given that the cross-cultural equivalence of measures could not be ascertained, these participants were not retained for the final sample. Three participants were removed as they did not indicate their age. Less than five percent of cases on each variable were missing and therefore mode substitution at the item level was chosen as the method to replace missing data. In addition, we used the Mahalanobis technique ($p < .001$) to identify four multivariate outliers who were removed from the final sample.

The final sample was composed of 193 participants aged between 17 and 25 years (M= 18.82 years; SD= 1.49 years; 71% female) who had diverse ethnic backgrounds. They described themselves as Caucasian/white (69%), African Canadian/black (6%), Hispanic/Latino (1%), East Asian (6%), South Asian (4%), Aboriginal/Native (1%), Middle East (5%), or other (7%). Students were enrolled in diverse programs of study. All participants performed their sport at a competitive level, ranging from regional to international. They reported various sport backgrounds and practiced their sport on average 11 hours per week.

Procedure

The ethical aspect of this study was approved by the Research Ethics Board at the university of the authors. Participants were recruited through a system of research participation at their university and were offered to be compensated by one participation point in their

introductory psychology course, which was awarded towards their final grade. They voluntarily enrolled in this study and provided informed consent prior to completion of a self-report online survey.

Measures

School-Sport Balance. We measured school-sport balance using the initial 54-item School-Sport Balance Scale (SSBS), from which we only used 12 items for the present analyses because these items were shown to be the final validated version of the SSBS (Morinville & Miranda, 2020). The SSBS has four subscales that assess: (1) Sport-school conflict; (2) school-sport conflict; (3) sport-school facilitation; and (4) school-sport facilitation. Participants were asked to indicate the extent to which each statement corresponded to their experience in the past months using a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree).* Internal consistency for sport-school conflict (α = .88), school-sport conflict (α = .79), sport-school facilitation (α = .72), and school-sport facilitation (α = .80) were all satisfactory.

Stress at School and in Sports. Participants were asked to evaluate the total level of subjective stress that they experienced in the past six months at school and also in sports, respectively. This was done on two different scales inspired by the stress thermometer (Kowalski & Crocker, 2001). They reported their stress levels on a 100-point scale ranging from 0 (no stress) to 100 (most stress ever experienced).

Sport Motivation. We used the full 28-item Sport Motivation Scale (SMS; Pelletier et al., 1995) to measure sport motivation. Participants rated items that assessed the reasons for which athletes practice their sport in general. Items were rated on a 7-point Likert-type scale ranging from 1 (*does not correspond at all)* to 7 (*corresponds exactly*). This questionnaire is composed of seven subscales (three of intrinsic motivation combined in one score, identified,

introjection, external, and amotivation). A composite score of autonomous sport motivation (i.e., intrinsic and identified motivation), and controlled sport motivation (i.e., introjection, external, and amotivation) were produced for this study. The autonomous sport motivation (α = .95) and controlled sport motivation (α = .83) measures had good internal consistency.

School Motivation. We used the full 28-item Academic Motivation Scale (AMS; Vallerand et al., 1992) to assess academic motivation. Participants rated items on a 7-point Likert-type scale ranging from 1 (*does not correspond at all)* to 7 (*corresponds exactly*) the reasons why they go to school in general. To compute autonomous and controlled school motivation, the same procedure was used as for sport motivation. The autonomous school motivation (α = .91) and controlled school motivation (α = .72) measures revealed satisfactory internal consistency.

Mental Health. We assessed participants' mental health (i.e., depression and anxiety symptoms) during the past six months with the 6-item Kessler Psychological Distress Scale (K6+, Kessler et al, 2003). Participants were instructed to report how frequently they experienced each item ranging from 1 (*all of the time*) to 5 (*none of the time*). Scores were reversed so that higher levels represent more symptoms. The internal consistency (α = .86) of this scale was satisfactory.

Results

Table 1 reports the means and standard deviations for all the variables of the study, as well as inter-correlations between all variables. We tested our serial mediation models using the SPSS (version 25) macro PROCESS (Hayes, 2018). All indirect effects were assessed with 95% bias-corrected confidence intervals (CI) based on 5000 bootstrap samples. The indirect effects and their associated CI are reported in Table 3.

From autonomous sport motivation to mental health. With respect to Figure 2 (Panel A), results showed no indirect effects for the relation between autonomous sport motivation and mental health through the serial mediation of school-sport balance and stress. Nevertheless, a positive direct effect was found between sport autonomous motivation and sport-to-school facilitation, as well as school-to-sport facilitation. Sport-to-school conflict also predicted more stress in sport, while school-to-sport conflict was associated with poorer mental health.

From controlled sport motivation to mental health. Regarding the relation between controlled sport motivation and mental health, results suggested no indirect effects through the serial mediation of school-sport balance and stress (Figure 2, Panel B). An indirect effect was nonetheless revealed between controlled sport motivation and poorer mental health through sport stress (β= .036; 95% CI = .000 to .085). Furthermore, controlled sport motivation was positively related to school-to-sport conflict. A positive direct effect was also found from controlled sport motivation towards stress in sports. Again, as seen before, sport-to-school conflict predicted more stress in sport, whereas school-to-sport conflict was associated with poorer mental health.

From autonomous school motivation to mental health. As shown in Figure 2 (Panel C), results revealed no indirect effects concerning the association between autonomous school motivation and mental health through the serial mediation of school-sport balance and stress. Nonetheless, an indirect effect suggested a mediating role of school stress in the relation between autonomous school motivation and poorer mental health (β =.036; 95% CI = .002 to .078). Moreover, autonomous school motivation predicted more sport-to-school facilitation and school-to-sport facilitation. Stress in school also predicted increased mental health issues. Furthermore, autonomous school motivation predicted less mental health.

From controlled school motivation to mental health. Finally, Figure 2 (Panel D) reports no indirect effects between controlled school motivation and mental health through the serial mediation of school-sport balance and stress. However, an indirect effect provided support for the mediating role of school stress between controlled school motivation and poorer mental health (β=.072; 95% CI = .020 to .138). Also, controlled school motivation predicted more school-to-sport conflict, more school-to-sport facilitation, more stress at school, and poorer mental health. Lastly, Stress in school was also related to more mental health issues.

Discussion

The main objective of this study was to better understand how motivation is an antecedent that may shape school-sport balance, which itself may first impact stress, and then mental health, as successive outcomes. More specifically, we tested four serial mediation models, in which autonomous and controlled motivation (school and sport) may shape school-sport balance (school-sport facilitation, sport-school facilitation, school-sport conflict, and sport-school conflict), which in turn may impact stress (school and sport) to finally impact mental health (depression and anxiety symptoms). Contrary to expectations, our findings did not reveal any indirect effects that could support that school-sport balance is a mediator within the relationships between motivation, stress, and mental health. As we will discuss when referring back to Figure 1 from the introduction; for the most part, our specific hypotheses were not supported.

Autonomous Sport Motivation, School-Sport Balance, Sport Stress, and Mental Health

Referring back to Figure 1 (panel A), our results show that only four of our 15 specific hypotheses were supported, and thus the majority were not confirmed. As expected, autonomous sport motivation was positively related to sport-to-school and school-to-sport facilitation. In this instance, our results are consistent with SDT, which postulates that autonomous motivation is

related to beneficial outcomes (e.g., Deci & Ryan, 2008; Ryan & Deci, 2000; Vallerand, 1997). Contrary to our hypotheses, autonomous motivation towards sport was not negatively associated with both dimensions of conflict (i.e., school-to-sport and school-to-sport conflicts). In some instances, previous studies that have investigated inter domain conflicts and motivation have found similar results indicating that self-determined motivation was not related to inter-domain conflict (e.g., Boiché et al., 2015; Boiché & Sarrazin, 2007; Ratelle et al., 2005). For example, Boiché and Sarrazin (2007) did not find a significant link between sport self-determined motivation and friendship-to-sport conflict. Similarly, conflict between school and leisure activities was not related to self-determined motivation for leisure activities (Ratelle et al., 2005).

Furthermore, only sport-to-school conflict was related to greater levels of stress, more specifically in sports. This partially supports our hypothesis as we had anticipated that school-to-sport conflict would also be related to more stress, while both dimensions of facilitation (sport-to-school and school-to-sport facilitation) would be linked to less stress. This is thus partially consistent with studies that have examined the interplay of multiple contexts and stress in university students have found that conflict between two domains was generally associated with more stress (e.g., Nicklin et al., 2018; Settles et al., 2002; Van Rens et al., 2016). Contrary to our hypotheses, both dimensions of facilitation were not related to less stress, which is nonetheless compatible with a study revealing no significant association between work-school facilitation and stress (Nicklin et al., 2018). Our hypotheses regarding school-sport balance and mental health were only partially supported. Our results showed that it is only when university student-athletes reported more school-to-sport conflict that they had poorer mental health. This is akin to previous studies which have shown that conflict between two domains may lead to poorer psychological health among university students (e.g., Creed et al., 2015; McNall & Michel,

2017; Park & Sprung, 2013; Ratelle et al., 2005). For university student-athletes, it seems that it is when their school demands impede their sport participation that it could have some detrimental impact on their mental health. Finally, sport stress did not predict more mental health issues as expected. This finding is contrary to the literature that has shown a link between stress and mental health in student-athletes (Etze et al., 2006; Humphrey et al., 2013).

Controlled Sport Motivation, School-Sport Balance, Sport Stress, and Mental Health

Referring to Figure 2 (Panel B), our results also reveal that only four of our 15 specific hypotheses were confirmed. Controlled motivation towards sports was only associated with more school-to-sport conflict but was not related to sport-to-school conflict. This therefore partially supports our hypothesis as it was expected that sport controlled motivation would be related to both sport-to-school conflict and school-to-sport conflict. Prior research on SDT provides conceptual support to our findings indicating that controlled motivation is related to more detrimental outcomes (e.g., Ryan & Deci, 2000, 2002; Vallerand, 1997). Contrary to our hypothesis, controlled sport motivation was not significantly and negatively associated with both sport-to-school and school-to-sport facilitation. As expected, controlled sport motivation predicted more stress in sport. In turn, this is coherent with prior research in the educational context indicating that university students who perceived more controlled motivation for their school reported higher levels of stress (e.g., Baker, 2004; Huang et al., 2016; Park et al., 2012). Furthermore, mirroring previous results with autonomous sport motivation (Panel A), sport-to-school conflict was linked to more sport stress, while school-to-sport conflict was also positively associated with more mental health issues.

Autonomous School Motivation, School-Sport Balance, School Stress, and Mental Health

Referring to Figure 2 (Panel C), our findings revealed that only four of our 15 specific hypotheses were confirmed. More specifically, as expected, our findings showed that university student-athletes who reported more autonomous motivation towards their school perceived more sport-to-school and school-to-sport facilitation. These findings echo the results from the model of sport autonomous motivation (Panel A). Furthermore, school stress predicted more mental health issues. This finding is in line with the coping model of Lazarus and Folkman (1984). That is, when individuals perceive that they do not have the resources to cope with their demands, negative outcomes occur which can lead to psychological distress (Lazarus & Folkman, 1984). It is also consistent with the extensive literature reporting that stress is an important vulnerability factor that can hinder mental health (Cohen et al., 2007; Hammen, 2015; Shankar & Park, 2016). Notably, this is in line with research among student-athletes which has also shown an association between stress and impaired mental health (e.g., Etze et al., 2006; Humphrey et al., 2013). Lastly and as expected, more school autonomous motivation predicted better mental health. This is line with previous research indicating that autonomous motivation was related to more well-being (Deci & Ryan, 2008; Healy et al., 2014; Weinstein & Ryan, 2011).

Controlled School Motivation, School-Sport Balance, School Stress, and Mental Health

Again, referring to Figure 2 (panel D), our findings indicate that only five of our hypotheses were confirmed. As expected, findings revealed that controlled school motivation was related to more school-to-sport conflict, which is similar to the results found for controlled sport motivation (Panel B). However, contrary to our hypotheses, controlled school motivation was unrelated to sport-to-school conflict. Surprisingly, controlled school motivation was also associated with more school-to-sport facilitation, and yet not associated with sport-to-school facilitation. Intriguingly, controlled motivation towards school was only related to school-sport

balance when school influenced their sport (i.e., school-to-sport conflict and school-to-sport facilitation). Therefore, when students report engaging in school for extrinsic reasons, their school seems to have a mixed-effect that is both positive and negative on their sport. These findings seem rather counterintuitive. However, some research examining self-determined motivation has found that controlled motivation is not always associated with negative consequences, but rather, it can also be linked to positive outcomes (Gillet et al., 2012). Perhaps these results suggest that university student-athletes perceive that their school responsibilities get in the way of their sport (school-sport conflict), but because of what is socially expected from them (e.g., the social norm and value that school is always beneficial) they may also think that their school should help their sport domain (school-sport facilitation). As a consequence, they are not truly engaging in school and sports for autonomous reasons (intrinsic reasons) and therefore both domains are not truly internalized into their self-concept. It has been suggested that individuals are within a culture of self-focus and individualism in which high expectations and performance is valued (see Twenge et al., 2010; Twenge et al., 2019). Are these cultural values, in fact, developing more controlled forms of motivation as university student-athletes are not engaging in activities because they truly enjoy them, but rather, because they think this is what is expected from them? Again, as seen previously (Panel B), controlled motivation towards school was related to experiencing more stress at school. In turn, school stress also leads to more mental health issues, which is consistent with the research in the domain of mental health indicating that stress is a risk-factor to developing mental health difficulties (Cohen et al., 2007; Hammen, 2015; Shankar & Park, 2016). Lastly, school controlled motivation predicted poorer mental health. These results are coherent with research in the domain of self-determination. Moreover, it

has been suggested that controlled motivation predicted lesser psychological functioning (Deci & Ryan, 2008; Healy et al., 2014; Vallerand, 1997).

Limitations and Future Research Directions

Despite the contribution of the present research it has some important limitations. First, our sample size was relatively small, which could have decreased our statistical power to detect significant indirect effects. Future work should replicate our hypothesized serial mediation models with larger samples, although student-athletes are not necessarily easy to recruit. Second, all the variables of this study were assessed using self-report measures. This represents an important limitation given that such measures are prone to common method variance and response bias (Podsakoff et al., 2003). Future research should attempt to complement self-report measures with other types of data (e.g., cortisol level to assess stress, semi-structured interviews to evaluate mental health). Third, our study used a cross-sectional design, which does not permit to have robust conclusions about the predictive directions among the variables. It would be important that future research use at least short-term longitudinal designs (e.g., few weeks or months) to clarify the antecedents and consequences of school-sport balance. Fourth, many hypotheses were unsupported in our study, this could possibly be contributed to the measures we used. Future research could use other measures of motivation, stress and mental health to circumvent this limitation.

Conclusion

Overall, our findings represent one step towards better understanding school-sport balance in university student-athletes. The present study provides preliminary knowledge regarding the motivational antecedents and mental health outcomes of school-sport balance. However, our findings suggest that school-sport balance is not a significant mediator within the relationships

among motivation, stress, and mental health. Nevertheless, a number of paths indicated that motivation may partially shape school-sport balance. Interestingly, sport-school conflict was linked with more stress in sport, whereas school-sport conflict was related to more mental health issues (more symptoms of depression and anxiety). Lastly, it also seems that when school motivation and school stress were taken into account school-sport balance did not predict stress or mental health issues. In sum, in terms of school-sport balance, the mental health of university student-athletes might be more specifically affected by the perception that academic duties obstruct sport participation.

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Table 1

Means (M) and standard deviations (SD) of all variables

	Range	M	SD
SPAM	1-7	5.07	1.12
SPCM	1-7	3.79	1.02
SCAM	1-7	4.94	0.94
SPCM	1-7	4.35	0.75
Sport-School Conflict	1-5	2.80	1.02
School-Sport Conflict	1-5	2.92	1.02
Sport-School Facilitation	1-5	3.50	0.84
School-Sport Facilitation	1-5	2.96	0.83
Sport Stress	0-100	56.98	22.15
School Stress	0-100	75.95	19.19
Mental Health	1-5	2.31	0.82

Note. N=193. Sport autonomous motivation (SPAM); Sport controlled motivation (SPCM); School autonomous motivation (SCAM); School controlled motivation (SCCM);

Table 2

Inter-correlations among all variables.

	1	2	3	4	5	6	7	8	9	10	11
1. SPAM	---										
2. SPCM	.44**	---									
3. SCAM	.50**	.32**	---								
4. SCCM	.44**	.63**	.39**	---							
5. Sport-School Conflict	.08	.15*	.01	.11	---						
6. School-Sport Conflict	.02	.21**	.08	.18*	.32**	---					
7. Sport-School Facilitation	.43**	.23**	.29**	.14	-.08	.04	---				
8. School-Sport Facilitation	.29**	.25**	.27**	.27**	.08	.10	.44**	---			
9. Sport Stress	.18*	.29**	.14**	.20**	.21**	.03	.17*	.12	---		
10. School Stress	.31**	.20	.24**	.32**	.07	.16*	.11	.05	.36**	---	
11. Mental Health	.00	.13	-.09	.19*	-.03	.13	-.08	-.07	.13	.28*	---

Note. N=193. Pearson Correlations. * $p < .05$. ** $p < .01$
Sport autonomous motivation (SPAM); Sport controlled motivation (SPCM); School autonomous motivation (SCAM); School controlled motivation (SCCM).

Table 3

Bootstrapping for indirect effects and 95% confidence intervals (CI) in the mediation models.

Specific indirect pathways	Standardized Estimate	95% Bias-corrected confidence interval [Lower, Upper]
Panel A: Sport Autonomous Motivation		
Autonomous Motivation Sport → Sport-School Conflict → Sport Stress → Mental Health	-.000	[-.003 .025]
Autonomous Motivation Sport → School-Sport Conflict → Sport Stress → Mental Health	.001	[-.002, .007]
Autonomous Motivation Sport → Sport-School Facilitation → Sport Stress → Mental Health	.008	[-.003, .030]
Autonomous Motivation Sport → School-Sport Facilitation → Sport Stress → Mental Health	-.000	[-.008, .006]
Total indirect effect autonomous sport motivation → Mental Health	-.064	[-.156, .023]
Panel B: Sport Controlled Motivation		
Controlled Motivation Sport → Sport-School Conflict → Sport Stress → Mental Health	.005	[-.001, .017]
Controlled Motivation Sport → School-Sport Conflict → Sport Stress → Mental Health	-.004	[-.013, .003]
Controlled Motivation Sport → Sport-School Facilitation → Sport Stress → Mental Health	.001	[-.003, .006]
Controlled Motivation Sport → School-Sport Facilitation → Sport Stress → Mental Health	-.000	[-.005, .005]
Total indirect effect controlled sport motivation → Mental Health	.043	[-.033, .121]
Panel C: School Autonomous Motivation		
Autonomous Motivation School → Sport-School Conflict → School Stress →Mental Health	-.000	[-.006, .003]
Autonomous Motivation School → School-Sport Conflict → Sport Stress → Mental Health	.000	[-.006, .007]

Autonomous Motivation Sport → Sport-School Facilitation → School Stress → Mental Health	.006	[-.006, .021]
Autonomous Motivation School → School-Sport Facilitation → School Stress → Mental Health	-.006	[-.019, .002]
Total indirect effect autonomous sport motivation → Mental Health	.015	[-.050, .084]
Panel D: School Controlled Motivation		
Controlled Motivation School → Sport-School Conflict → School Stress → Mental Health	.001	[-.005, .007]
Controlled Motivation School → School-Sport Conflict → School Stress → Mental Health	.005	[-.001, .014]
Controlled Motivation Sport → Sport-School Facilitation→ Sport Stress → Mental Health	.001	[-.005, .008]
Controlled Motivation School → School-Sport Facilitation → School Stress → Mental Health	-.006	[-.019, .002]
Total indirect effect controlled sport motivation → Mental Health	.066	[-.004, .148]

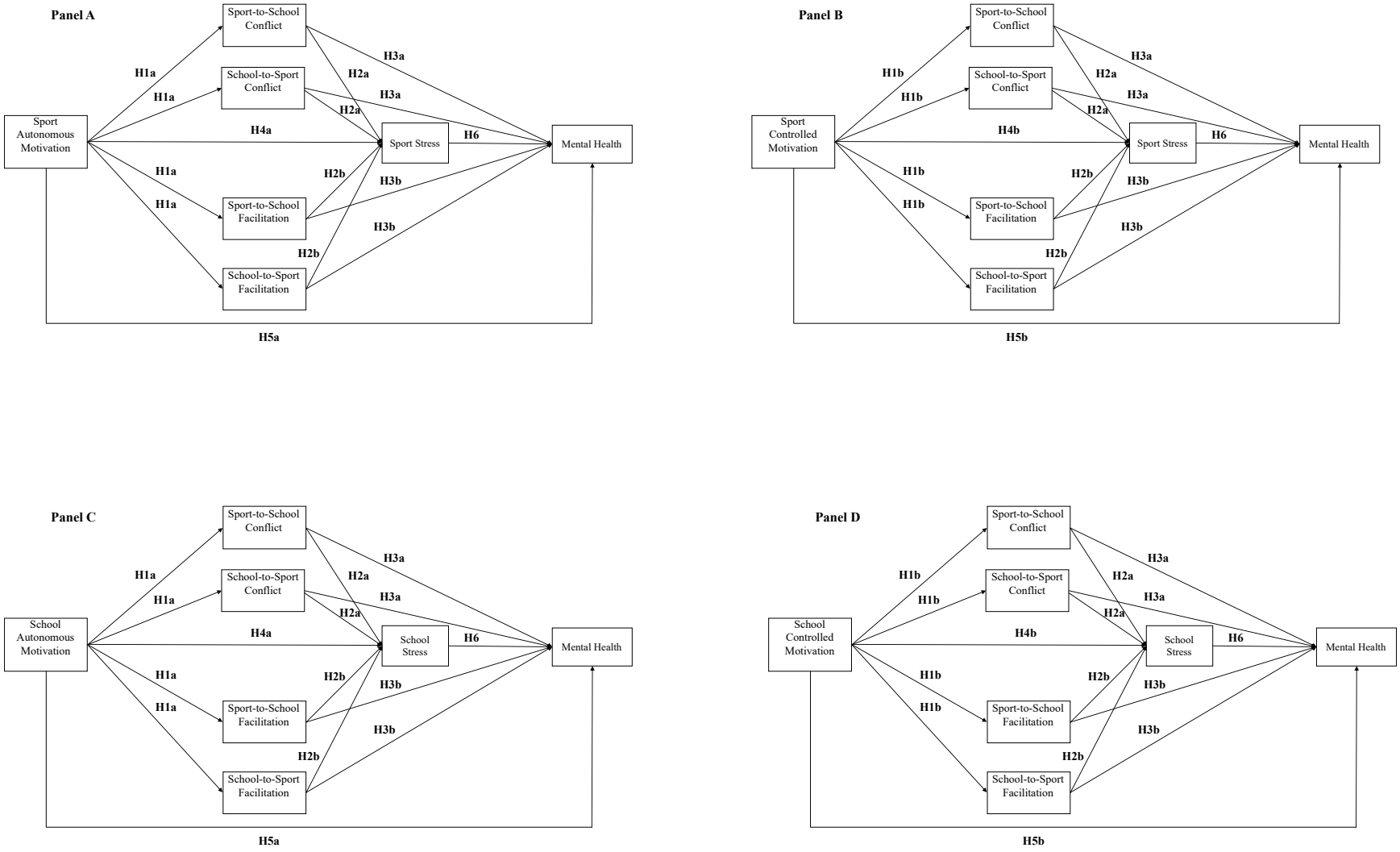

Figure 1. Hypothesized serial mediation models for motivation, school-sport balance, stress, and mental health.

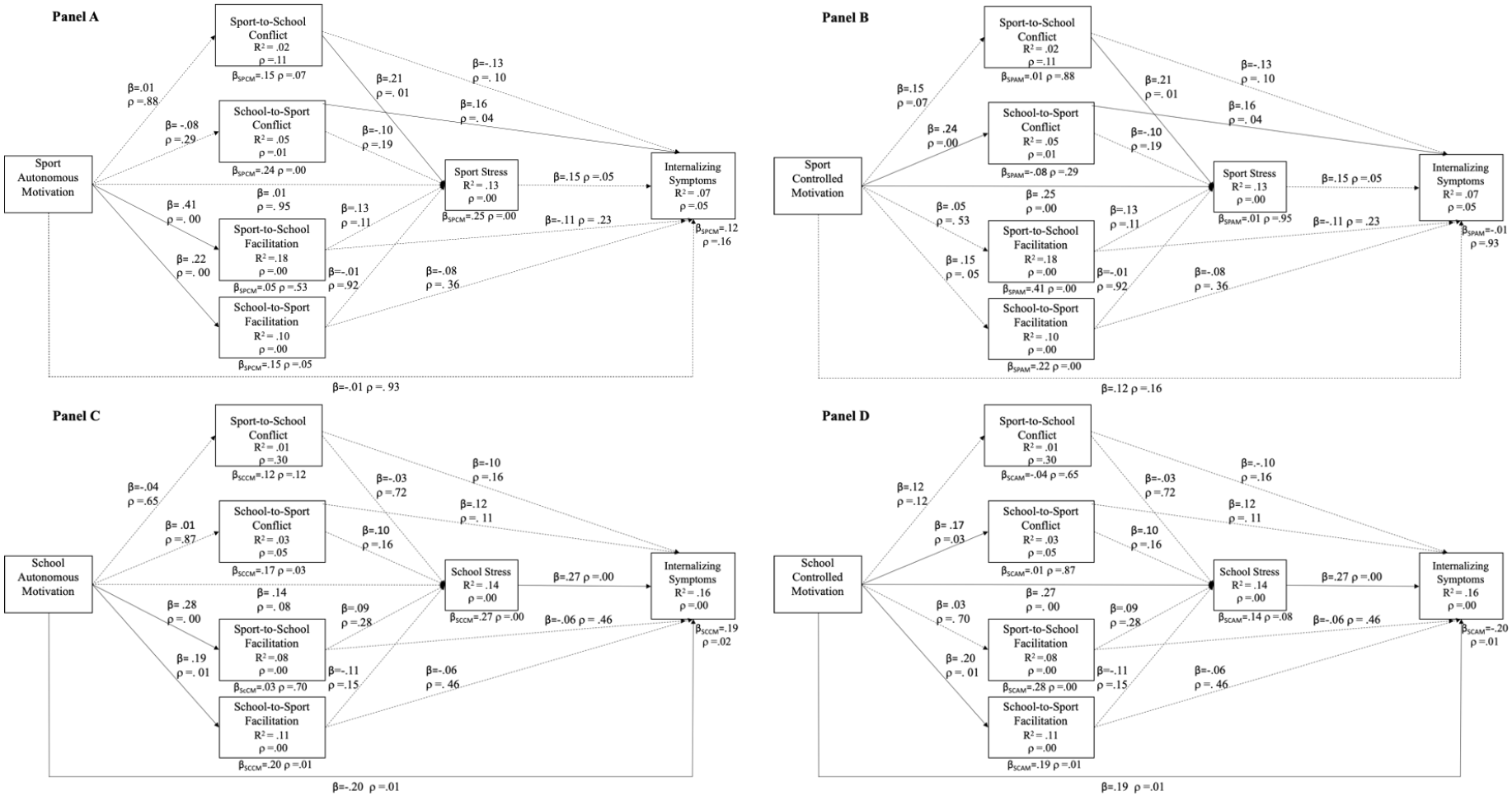

Figure 2. Results from the four serial mediation models for motivation, school-sport balance, stress, and mental health.
Notes. N=193; Standardized beta coefficients for control variables are sport controlled motivation (β_{SPCM}), sport autonomous motivatioùn (β_{SPAM}); school controlled motivation (β_{SCCM}); and school autonomous motivation (β_{SCAM}).

CHAPTER 4: General Discussion

Summary of Thesis Objectives

The purpose of this dissertation was to better understand how university student-athletes perceive the interplay between their school and sport demands, which I defined as being *school-sport balance*. As reviewed in the general introduction, the extant literature has several theoretical and methodological shortcomings when examining balance between multiple domains in the lives of university student-athletes. These research caveats were therefore addressed in three ways in this doctoral dissertation. The first objective, which was achieved in the *general introduction* of this dissertation, was to develop a conceptual framework of school-sport balance among university student-athletes. The construct of school-sport balance was guided by three main perspectives in psychology, namely role theory, self-determination theory, and the holistic perspective of the athlete. The second objective, which was partially achieved in *Article 1*, was to develop and conduct a preliminary validation of a self-report scale that measures the perception of balance between school and sport roles among university student-athletes. More specifically, the objective was to assess the psychometric properties of the School-Sport Balance Scale (SSBS), notably its content validity, factorial validity, internal consistency, and nomological network in terms of developmental correlates. Finally, the third objective, which was achieved in *Article 2*, was to investigate the potential antecedents and consequences of school-sport balance among university student-athletes. To this end, we tested four serial mediation models in which contextual motivation (school or sport) would lead to mental health (depression and anxiety symptoms) through two sequential mediators, school-sport balance and contextual stress (school and sport), respectively. The main findings of both

empirical studies using two independent samples are integrated and revisited in this general discussion.

Summary of Findings

Article 1. The purpose of *Article 1* was to develop and conduct the preliminary validation of the School-Sport Balance Scale (SSBS). The results from a confirmatory factor analysis (CFA) revealed that the SSBS could be structured by four basic dimensions of school-sport balance: (1) school-to-sport conflict; (2) sport-to-school conflict; (3) school-to-sport facilitation; and (4) sport-to-school facilitation. Moreover, results from Cronbach's alphas suggested that the four dimensions of the SSBS had satisfying internal consistency. Unexpectedly, we found that experiencing more facilitation was also associated with experiencing more conflict. Indeed, there were two intercorrelations between school-to-sport conflict and both (a) sport-to-school facilitation and (b) school-to-sport facilitation. This finding was surprising and suggests that facilitation and conflict are probably not two entirely distinct dimensions (orthogonal), contrary to what was originally hypothesized. In other words, when university student-athletes experience facilitation between their school and sport demands they unavoidably also experience some degree of conflict between both of these domains. This finding is very intriguing because prior research in organizational psychology, which have used the same taxonomic structure for balance, have found that work-family facilitation and work-family conflict were distinct dimensions (Grzywacz & Butler, 2005; Wayne et al., 2004). Also, results from previous studies have typically revealed that both of these dimensions are not correlated (e.g., see meta-analysis Wayne et al., 2004). Our divergent findings are possibly due to the fact that this dissertation focused on a different population and life domains. For instance, emerging adulthood represents a distinct period of development where young people do not perceive themselves as being

adolescents, but they do not yet feel as mature adults (Arnett, 2000, 2015). This could have possibly contributed to the different results because emerging adults are within a developmental period in wich identity exploration is an important endeavor. Therefore, it is possible that their school and sport demands are not as clear cut as in adulthood and, in turn, they feel "in-between" as they are navigating greater autonomy and independence (Arnett, 2000).

Furthermore, a higher-order CFA was conducted to determine if two overarching dimensions may subsume the four dimensions of school-sport balance, namely *Interference* (e.g., sport-to-school and school-to-sport conflicts) and *Synergy* (e.g., sport-to-school and school-to-sport facilitations). Unfortunately, the results were not reliable nor interpretable because of nonsensical estimates, which were probably due to the small sample size. Future work should revisit the question of the higher-order structure of the SSBS with a larger sample. Lastly, we examined a nomological network in terms of developmental correlates. Results suggested that school-sport balance among university student-athletes could be associated with some developmental benefits (e.g., autonomous motivation), as well as some developmental costs (e.g., athletic burnout). Although SSBS was associated to some developmental correlates, most of the correlates that were tested in Article 1 were, however, not associated with SSBS. Taken together, the results from *Article 1* provide some support for the reliability and preliminary validity of the SSBS. However, this measure requires further improvement notably because of unexpected correlations between its factorial dimensions. It will be very important that future research cross-validate the findings of *Article 1*.

Article 2. *Article 2* built on some important developmental correlates (i.e., motivation, stress, and mental health) that were examined in *Article 1*. The objective of *Article 2* was to explore potential antecedents and consequences of school-sport balance. To extend the

conceptualization of school-sport balance, mediational models were hypothesized that school-sport balance might be a mediating mechanism. Four serial mediation model were tested, in which contextual motivation (in school or sport) would predict mental health (depression and anxiety symptoms), through school-sport balance (school-sport conflict, sport-school conflict, school-sport facilitation, and sport-school facilitation) and contextual stress (in school and sport), respectively. Contrary to our expectations, results from *Article 2* did not report any indirect effects (mediation effects) through school-sport balance. This suggests that school-sport balance is not a mediator of the relationships among motivation, stress, and mental health. Nonetheless, two other key findings emerged from *Article 2*. First, several paths were significant from motivation to school-sport balance. This may signify that motivation could partially shape school-sport balance. However, findings from prior research examining the relationships between motivation and multiple life domain conflict are also mixed (e.g., Healy et al., 2016; Ratelle et al., 2005; Senécal et al., 2001, 2003). Second, results revealed that sport-school conflict was related with more sport stress, whereas school-sport conflict was associated with poorer mental health. In sum, this finding may suggest that the mental health of university student-athletes could be affected when they perceive that their academic responsibilities impede their sport participation. This specific finding echoes results from past studies that have demonstrated that conflict between two life domains predict lesser psychological health in university students (e.g., Creed et al., 2015; McNall & Michel, 2017; Park & Sprung, 2013; Ratelle et al., 2005).

Overall Contributions of this Dissertation

The present dissertation has five main research contributions. The first contribution is that it addressed important shortcomings in the understanding of balance among multiple domains in

psychology. More specifically, this dissertation is probably the first to have provided a comprehensive understanding of the interplay between the athletic and academic domains of university student-athletes. Thus far, the question of balancing multiple domains has been studied across different disciplines of psychology. This has led to many different conceptualizations of balance, each looking at it from a different angle. However, it has also made the understanding of this concept fragmented because of the lack of comparable studies using similar definitions. The general introduction of this dissertation provided an integration of relevant subdisciplines in psychology that have examined balance among multiple domains. In particular, I was able to integrate useful features from three important perspectives, namely role theory (Kahn et al., 1964), self-determination theory (SDT; Ryan & Deci, 2000), and the holistic perspective of athletes (Wylleman et al., 2013). This provided a much better-informed conceptual framework of the construct of school-sport balance. First, the role theory framework used in organizational psychology guided the multidimensional taxonomy of school-sport balance. To my knowledge, this dissertation was the first to apply this multidimensional structure to the sport context. Second, the research on multiple domains that have used the SDT framework also provided guidance to help determine potential motivational antecedents and mental health outcomes to school-sport balance. Finally, third, the literature among dual careers in athletes helped to position my school-sport balance construct within a holistic perspective, which supported the importance of studying the conciliation of student-athletes sport and academic domains.

The second contribution is that, to the best of my knowledge, there was no existing self-report measurement scale that assessed my construct of school-sport balance among university student-athletes. To date, available questionnaires had either theoretical or conceptual caveats

which made it difficult to use them to fully measure school-sport balance among university student-athletes. My doctoral research program addressed these existing gaps by developing a tool to measure student-athletes' perception of balance between university and sport demands, namely the *School-Sport Balance Scale* (SSBS). *Article 1* provided preliminary evidence that the SSBS can be a measure that evaluates conciliation of school and sport demands among university student-athletes. The SSBS could therefore be a new research tool that could eventually be used for research in sport psychology. Nevertheless, although initial findings suggested adequate validity and reliability of the SSBS, some components of the SSBS will need more exploration because of many of its limitations that were discussed specifically in *Article 1* of this dissertation. Importantly, with a larger sample, researchers should determine if two higher-order dimensions, namely synergy and interference, can encompass the four lower-order dimensions (i.e., school-sport conflict, sport-school conflict, school-sport facilitation, and sport-school facilitation). Also, as for all preliminary validation studies, it is critical that findings of *Article 1* be replicated with larger samples of university student-athletes.

When future research will provide more support that the SSBS is a valid tool throughout various samples of university student-athletes, this questionnaire may possibly inform parents, coaches, or mental health professionals as to when to help student-athletes adjust and conciliate more effectively their multiple demands throughout a competitive season. Furthermore, having a more comprehensive portrait of school-sport balance could also contribute to future evidence-based social initiatives (e.g., education, prevention, and intervention) with university student-athletes for whom managing concurrent demands effectively is an important developmental endeavor. University and/or sport associations could develop programs that could teach university student-athletes' important skills to deal more appropriately with their competing life

domains (i.e., time management, organization, planification, etc.) to help them manage their competing school and sport demands. These skills would also be useful for other competing demands that they will be confronted to later in adulthood (e.g., work-sport, work-study or work-family).

The third contribution is that this dissertation suggests that there could be inevitable costs to the benefits associated with being a university student-athlete. The findings from this dissertation suggest that when university student-athletes experience facilitation between their school and sport-related demands they could simultaneously experience some degree of conflict between their school and sport. In other words, school-related benefits could possibly be accompanied by some detriments obtained from their sport participation at university. For example, university student-athletes might be at their sport practice and feel that they cannot physically and/or mentally engage in their sports because of their school demands (e.g., thinking about all their schoolwork). During this practice, they might also perceive that they will "burn off some steam" which then will help them refocus and have a more positive attitude about their school. Therefore, it might be that for university student-athletes it is important that the developmental benefits of engaging both in sports and academics significantly outweigh the inevitable detriments of devoting mental and physical resources across two life domains.

In addition, possibly for each university student-athlete the importance of each dimension can be different depending on their self-concept (Baumeister, 1997). This notion could perhaps help better understand the construct school-sport balance. According to Baumeister (1997), "the self-concept refers to the totality of inferences that a person has made about himself or herself. These refer centrally to one's personality traits and schemas, but they may also involve an understanding of one's social roles and relationships" (p.681). Therefore, it is possible that for

some university student-athletes the sport domain takes a greater part of their self-concept than the school domain, and vice-versa. For example, some individuals might attend university because this is the only place where they can practice their sport beyond high school. For these individuals, being an athlete is much more part of their self-concept than being a student. They might perceive more sport-to-school facilitation and school-to-sport conflict than those who identify themselves more as being a student than an athlete. This might signify that school-sport balance can be perceived differently depending on their self-concept. For individuals who identify more to one domain than the other, some dimensions could weigh more for them than other dimensions of school-sport balance. Future research could possibly conduct cluster analysis to better investigate how the notion of self-concept can influence the perception of student-athletes school-sport balance.

The fourth contribution, which was provided by findings in *Article 2*, is that the reasons *why* student-athletes engage in their school and sport activities may represent a determinant that could shapes their perception of school-sport balance. Motivation might be an antecedent that influences university student-athletes' perception of school-sport balance. However, the findings of both *Article 1 and Article 2* also revealed unexpected results between controlled motivation and some dimensions of school-sport balance. Tenets of SDT have traditionally suggested that more autonomous types of motivation were associated with more beneficial outcomes, whereas more controlled types of motivation were related with more detrimental outcomes (e.g., Ryan & Deci, 2000, 2017; Vallerand, 1997). Yet, results from this dissertation did not necessarily support this assertion from SDT. Overall, findings from both articles indicated that autonomous motivation was sometimes related to dimensions of conflict, while controlled motivation was also at times associated to dimensions of facilitation. This rises an interesting research question.

As discussed by other scholars (e.g., Healy et al., 2016), research in SDT has principally studied one life domain in isolation. It has less frequently examined the perception of conciliation across multiple life domains. It is therefore possible that different motivational processes occur within the dynamic interplay between different life domains. The notion of spill-over effect (Vallerand, 1997) could possibly explain some unexpected results between motivation and school-sport balance. It is possible that for some individuals one domain is more important than the other and therefore their level of motivation will be more autonomously oriented in one domain than the other. For instance, this could mean that if the sport domain is more important for a university student-athlete (i.e., higher levels of autonomous motivation for sports) they might experience more sport-to-school facilitation and more school-to-sport conflict because the sport domain is more meaningful for them than school. Findings from this dissertation contribute to extend the knowledge regarding multiple domains using the SDT framework. More particularly, this dissertation possibly opens the discussion as to whether the assumptions of SDT remain applicable when examining the interplay between two life domains.

The fifth and final contribution of this dissertation suggests that mental health might be a consequence of school-sport balance, but more specifically when school is perceived as obstructing sport activities. Previous research has expressed concerns regarding the lack of research focusing on student-athletes' mental health (e.g., Stambulova & Wylleman, 2019; Van Slingerland et al., 2018). This issue was partially addressed in *Article 2* by examining stress and mental health as potential consequences of school-sport balance. The findings of *Article 2* revealed that when school impedes university student-athletes' sport participation, they seem to also have more depression and anxiety symptoms. In other words, this means that when they perceive that their school is taking too much time away from their sport or that they cannot

accomplish everything in their sport because of their school related-demands, university student-athletes might feel more anxious and depressed. As discussed earlier, when these research findings will be replicated, this could contribute to future evidence-based prevention and intervention programs focused on university student-athletes. Given that they are in a culture that is constantly focused on high-performance and competition, programs could teach student-athletes skills to help manage their feelings of overload but also the importance of self-care. More importantly, this research finding is also interesting as it supports the notion that student-athletes can also experience mental health difficulties. It speaks to the fact that mental health is also important for student-athletes and that more research is needed to completely understand mental health for the specific population of student-athletes. Indeed, academic institutions and sport associations have started to recognize the need to prioritize athletes' mental health and address the ongoing stigma associated with mental health in the sport context. For example, *Bell Let's Talk student-athlete initiative* is an example of how mental health awareness is being promoted in the student-athletic population. Canadian student-athletes have launched a Bell Let's talk videos with the objective to share their struggles with mental health. The *Student-Athlete Mental Health Initiative* (SAMHI) is a Canadian organization that also has a mission to help destigmatize and educate about mental health problems in the student-athlete population. These various initiatives speak to the importance of mental health in student-athletes. The findings from this dissertation support the importance of these social initiatives by showing that university student-athletes can experience depression and anxiety symptoms.

Limitation and Future Research Directions

This dissertation has important limitations that need to be addressed in future research. This section will focus on research shortcoming related to the samples, measures, and designs used in this dissertation.

Sample

The samples used in both empirical studies (*Articles 1 and 2*) were composed of undergraduate university students who participated in sports at a competitive level. They were asked to rate their level of competition according to five categories: recreational, regional, provincial, national, and international. Hence, both empirical studies only included participants who did competitive sports. All participants who reported doing recreational sports were excluded from both studies. As a consequence, however, both studies have a small sample. This issue is not uncommon when studying specific populations such as university student-athletes (Bernards et al., 2017). Yet, given our small samples, it is likely that the lack of statistical power prevented to provide a complete portrait of the possible significant relationships. In this dissertation, the more complex statistical analyses (i.e., higher-order confirmatory analysis and serial mediation model) that were used possibly needed more statistical power. It is probably due to a small sample that some of the relationships studied were possibly too small to be detected. To address this limitation, future work should obtain larger samples to further validate the factorial structure of the SSBS (*Article 1*) and reproduce the mediation model tested in *Article 2*. For example, researchers could collaborate with athletic associations, universities, or use online platforms (e.g., Prolific) to recruit more student-athletes who attend university.

The athletic level, degree of sport engagement, and sport discipline were not considered in the analyses and this represents an important limitation. As mentioned previously, participants in

Article 1 and 2 were involved in sports at various levels of competition, ranging from regional to international levels. Although this provides information regarding school-sport balance in a more general population of university student-athletes, it is possible that perception of school-sport balance differs for participants who compete at different levels of competition. To circumvent this limitation, future research could collaborate with sport federations to aim at recruiting participants at various levels of competition. Researchers could also examine if significant moderating effects exist for different levels of competition. It is recommended that future work investigates the moderating effects of sport background (individuals vs. teams sports, type of sport) in order to determine if significant differences exist within individual and team sports and different disciplines. Prior studies have found that athletes who compete in individual sports are more prone to experience depression symptoms in comparison to athletes competing in team sports (Nixdorf et al., 2016; Wolanin et al., 2016). Nixdorf and colleagues (2016) explain in their paper that one possible explanation could be related to differences in their type of attribution. For instance, it has been found that athletes in individual sports tend to make more "internal" attributions (Hanrahan & Cerin, 2009) because they can only rely on and blame themselves (Nixdorf et al., 2016). This same logic could apply to school-sport balance. Furthermore, all participants were recruited through a system of research participation in which they were compensated by one participation point in their introductory psychology course. This limits the generalization of findings to a broader population of university student-athletes. Future work could recruit student-athletes in various programs and academic settings to ensure that the sample is much more diversified. My dissertation also focused on the developmental period of emerging adulthood and therefore the ages in our samples ranged from 17 to 25 years old. Students in various years of their undergraduate studies might perceive their school-sport balance

differently. Research has stated that the first years of university were perceived as more stressful among undergraduate students because of an increase in many demands and transitions (Deal & Camiré, 2016; Gall et al., 2000; Malinauskas & Dumciene, 2017). Perhaps students in third and fourth years of their undergraduate studies have found some sort of balance in between their school and their sport domains as they are still in university and have not dropped out. Future research should determine if first and second years are more at risk of experiencing conflict between their school and sport demands.

Measures

Another limitation of this dissertation is that both studies relied on self-report measures. Although self-report questionnaires have advantages, they are also inclined to common method variance (Podsakoff et al., 2003, 2012). The issue with self-report questionnaires is that the variance is attributed to the measurement method instead of the construct measured by the questionnaire. Therefore, in our dissertation, for each participant, data were obtained by the same rater and every questionnaire used the same response format (i.e., Likert-scale). To limit this bias, future research could use a mixed-method designs. For instance, self-report questionnaires could be accompanied with observational reports of the level of school-sport balance (e.g., from peers, teammates, coaches) to triangulate findings. To assess the mental health of university student-athletes, researchers could also use structured or semi-structured interviews (e.g., Structure Clinical Interview for DSM-5). Self-report measures can also lead to specific response bias (Podsakoff et al., 2003). Social desirability bias is one type of responding bias, which is characterized by the tendency for participants to answer the questions in order for them to be perceived favorably (Podsakoff et al., 2003). For example, in the context of this dissertation, participants might have been inclined to portray that they are managing

adequately their concurrent school and sport demands and report that they experience few conflicts between both domains. They might also have reported fewer symptoms of psychological distress than what they are actually experiencing. Future research on SSBS could use social desirability measures to control for this limitation.

The development of the SSBS questionnaire also has shortcomings. *Article 1* conducted the preliminary validation of this measure using only one sample. In the past, some studies have validated their scales with one sample (e.g., Blais-Rochette et Miranda, 2016; Ryba et al., 2017), however, it is greatly preferable to replicate results with at least a second sample when developing a questionnaire. It is important that future research replicate the factorial structure of the SSBS with multiple samples. Future work should test alternative models of SSBS to determine if the fit of the four-factor model of SSBS is superior to other models. For example, future research should examine if SSBS can be structured by a one-factor model or a two-factor model. It will also be important to revisit the questions of the SSBS to determine if they are the most optimal questions to measure school-sport balance in university student-athletes. Moreover, future studies should also test various types of validity (convergent, concurrent, discriminant, and incremental, etc.) as *Article 1* mainly tested content validity, factorial validity, and correlates of SSBS. Additionally, some estimates from the higher-order CFA were not interpretable because they were nonsensical. This issue probably resulted from using a small sample to test a higher-order CFA with higher-order factors that only had two lower-order indicators each. It will be important that future work use a larger sample to test the higher-order structure of the SSBS. Also, participants in both studies were provided with the choice to answer the survey in English or in French. The preliminary SSBS was therefore developed in English and in French. Given that each of those studies did not recruit enough francophone participants that answered the

French version of the SSBS, it was not possible to conduct a cross-cultural validation of the French version of the SSBS. It is recommended that researchers who are interested in using a French version of the SSBS recruit a large enough sample to validate this measure in French. Moving forward, future research should conduct invariance testing on different groups (e.g., gender) and examine test retest reliability of the SSBS. Finally, in *Article 1*, all four dimensions of school-sport balance were associated to only a few developmental correlates. In *Article 2*, motivation was a significant antecedent of school-sport balance, whereas stress and mental health were only related to few dimensions of school-sport balance. Although our findings provide initial evidence about some correlates and certain potential antecedents and consequences of school-sport balance, it is essential that future research continue to examine the relationship between school-sport balance and other variables. In *Article 1*, general outcomes and sport-related contextual outcomes were examined, researchers could also look at school-related outcomes (e.g., school burnout, GPA) and other important sport-related contextual outcomes (e.g., motivational climate). Researchers could also examine if personal disposition (i.e., personality traits, perfectionism, etc.) could be potential antecedents of school-sport balance. The motivational climate is another important variable that should be examined in future research (e.g., Perreault, 2005). In my dissertation, I only measured one aspect of mental health (i.e., psychological distress/internalizing symptoms). To circumvent this limitation, future work could have a more comprehensive view of mental health by examining indicators of both mental illness and mental health (i.e., well-being). In addition, moderating effects could possibly be at play and could have masked certain effects between school-sport balance and mental health (e.g., coping abilities, social support). For instance, there might be differences for university student-athletes

who have developed more adaptive coping mechanisms and who are surrounded and supported by friends and parents.

Lastly, using mode substitution as the imputation method (i.e., replacing missing values by the mode of the non-missing values of an item) was used to replace missing data in both studies. A limitation when using mode substitution is that it can underestimate variance and covariance and overestimate correlations within the imputed data (Tabachnick & Fidell, 2017). Of note, well below 5% of cases for each item in this dissertation were missing and data were missing completely at random (MCAR). Therefore, this reduced the probability that our results were biased because of the method we used to treat missing data. Future research should consider using more sophisticated methods to replace missing data, such as full information maximum likelihood or multiple imputation with confidence intervals.

Design

This dissertation used a cross-sectional design and therefore the observed relationships remain bivariate and non-predictive. Cross-sectional designs do not permit to make inferences regarding causal mechanisms (i.e., direction of the relationships) nor about direction of prediction. Future research should adopt longitudinal research with variables measured at different moments in the academic year and athletic season. For example, when replicating the mediation model of *Article 2*, it would be important that the antecedents, mediators, and consequences be collected at different time points. In doing so, it will be possible to determine if the relationships are really predictive.

Given that the design of this dissertation was cross-sectional, school-sport balance was measured at any point in the semester. Findings of this dissertation suggest moderate inter-correlation between both dimension of school-sport balance. This means that conflict and

facilitation could both be present within a person, although to a fluctuating level for different persons. Additionally, the level of conflict and facilitation experienced by student-athletes could vary throughout a semester. For example, it was determined that the level of stress experienced by junior soccer player fluctuated over a ten-week period (Ivarsson et al., 2014). It is possible that student athletes could experience more school-to-sport conflict before exam period or that they could perceive more sport-to-school conflict during important sport events (e.g., important matches/competitions, team selections, etc.). Therefore, future research should take into account within-person combinations of conflict and facilitation. More specifically, researchers should consider measuring school-sport balance at significant times of the semester (e.g., beginning of the semester, during exams, during a competition period, etc.) to determine if multilevel variations exist within an individual. By knowing when student-athletes experience more conflict between their sport and school domains, interventions could focus on significant periods and inform mental health professionals, coaches, and sport federations when are the most important times to intervene in the lives of university student-athletes.

Conclusion

In sum, it has become evident throughout this dissertation that school-sport balance among university student-athletes is a complex construct to define and understand. Nevertheless, this dissertation has to some extent successfully addressed three major research caveats by : (1) providing an original conceptual model of school-sport balance among university student-athletes, (2) developing and conducting a preliminary validating of the first scale that assesses the construct of school-sport balance in student-athletes, and (3) testing a mediation model of school-sport balance with potential motivational antecedents and mental health outcomes. The most important take-home-message from this dissertation might in fact be that university

student-athletes can possibly experience benefits (facilitation) at the same time as costs (conflict) from participating in sports at university. It might be normative for university student-athletes to experience conflict at the same time as facilitation. As such, for thousands of student-athletes who are trying to prioritize education while being fully committed to sports at university, the antique ideal of *mens sana in corpore sano* (i.e., a healthy mind in a healthy body) might be easier said than done. The answer might be that it could be important that the benefits associated with engaging in a sport while being a university student must significantly and consistently exceed its inevitable costs. In other words, as they will experience both conflict and facilitation it is possibly more adaptive when their level of facilitation is greater than the amount of conflict they experience. It could perhaps be that for some individuals one domain is more important to them than the other and therefore one dimension of the school-sport balance could have more importance than the other dimensions when examining developmental outcomes. On a final thought, much more research is needed in order to fully understand the role of school-sport balance in the lives of university student-athletes, but the ideas proposed in this dissertation are a useful step in the right direction.

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Appendix

Appendix B: Initial School-Sport Balance Sale (SSBS) from Article 1

Read the following statements. Then using the scale below, indicate to what extent these statements are true for you.

Disagree stongly	Disagree moderately	Agree a little	Agree moderately	Agree strongly
1	**2**	**3**	**4**	**5**

In general, during the last months (since September xxxx)…

1	I can't give my 100% in school because I am too involved in sports	1	2	3	4	5
2	I could achieve more at school if I spent less time in sports	1	2	3	4	5
3	I am often tired when I am in class because of my involvement in sports	1	2	3	4	5
4	My sport interferes with my school (e.g., school work, studying)	1	2	3	4	5
5	Sports conflicts with school	1	2	3	4	5
6	Sports keeps me from studying and doing my school work	1	2	3	4	5
7	I missed important material in class because of sports	1	2	3	4	5
8	I didn't do well during some exams because of sports	1	2	3	4	5
9	Sport is often my priority even though it should be school	1	2	3	4	5
10	I often study at the last minute because of sports	1	2	3	4	5
11	I often hand in my school work late because of sports	1	2	3	4	5
12	After a practice, I am often too exhausted to study or do my school work	1	2	3	4	5
13	When I am at university, I can't stop thinking about sports	1	2	3	4	5
14	When I have a bad day in sports, I am in a bad mood at school	1	2	3	4	5
15	I can't give my 100% in sports because I am too involved in school	1	2	3	4	5

16	I could achieve more in sports if I spent less time in school	1	2	3	4	5
17	I am often tired when in sports because of my involvement in school	1	2	3	4	5
18	My school work interferes with sports	1	2	3	4	5
19	School conflicts with sports	1	2	3	4	5
20	School work keeps me from doing sports as much as I wished	1	2	3	4	5
21	Thinking about school during sports keeps me from concentrating in sports	1	2	3	4	5
22	I missed sport practices or competitions because of school	1	2	3	4	5
23	I often have a hard time replacing my sport practices because of school	1	2	3	4	5
24	I often choose to study or do school work even though I should be doing sports	1	2	3	4	5
25	I am often late for sports because I had to do school work or study	1	2	3	4	5
26	After a day at school, I am often too exhausted to do sports	1	2	3	4	5
27	When I am doing sports, I can't stop thinking about school	1	2	3	4	5
28	When I have a bad day at school, I am in a bad mood in sports	1	2	3	4	5
29	A good day in my sports, inspires me to do my school work or study	1	2	3	4	5
30	I am in a good mood at school because of sports	1	2	3	4	5
31	I have more energy at school because of sports	1	2	3	4	5
32	I can use the skills I learned in sports at school	1	2	3	4	5
33	The things I do in sports make me a more interesting person at school	1	2	3	4	5
34	My experience in sports gives me a more positive attitude for school	1	2	3	4	5
35	My sport helps me succeed more effectively at school	1	2	3	4	5
36	The things I learn in sports completes effectively the things I learn at school	1	2	3	4	5
37	I can manage more effectively my sport schedule because of the discipline I learned in school	1	2	3	4	5

38	I manage my time more effectively at school because of what I learned in sports	1	2	3	4	5
39	I learn more quickly at school because of what I learned in sports	1	2	3	4	5
40	I am more effective when I do my school work or study when I am able to help people that need my support in sports	1	2	3	4	5
41	I complete my school work more quickly and I need to study less to have good marks because of the interpersonal skills I learned in sports	1	2	3	4	5
42	A good day at school, inspires me to do have a good sport practice	1	2	3	4	5
43	I am in a good mood in sports because of school	1	2	3	4	5
44	I have more energy in sports because of school	1	2	3	4	5
45	I can use the skills I learned at school in sports	1	2	3	4	5
46	The things I do at school make me a more interesting person in sports	1	2	3	4	5
47	I have a more positive attitude in sports because of my school experiences	1	2	3	4	5
48	School helps me succeed more effectively in sports	1	2	3	4	5
49	The things I learn at school completes effectively the things I learn in sports	1	2	3	4	5
50	I can manage more effectively my school schedule because of the discipline I learned in sports	1	2	3	4	5
51	I manage my time more effectively in sports because of what I learned at school	1	2	3	4	5
52	I learn more quickly in sports because of what I learned at school	1	2	3	4	5
53	I am more effective in my sports when I am able to help people that need my support in school	1	2	3	4	5
54	I complete my sport obligations more quickly and I obtain better sport performances because of the interpersonal skills I learned at school	1	2	3	4	5