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Goal motives and well-being in student athletes: A person-centered approach

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Abstract

Using a person-centered approach, the aim of this study was to examine how student-athletes motives for multiple goal pursuit relate to indices of well- and ill-being. Student-athletes (*N* = 362) from British Universities identified their most important sporting and academic goals that they were pursuing over the academic year. Participants rated their extrinsic, introjected, identified, and intrinsic goal motives for each goal, and completed measures of well- and ill-being. Latent Profile Analysis revealed six distinct profiles of goal motives, with variations in both the strength of motives and the motivational quality. Follow-up analyses revealed between-profile differences for well- and ill-being; students with more optimal goal motive profiles reported higher and lower well- and ill-being respectively than those with less optimal goal motives. To experience well-being benefits when pursuing multiple goals, student-athletes should strive for their academic and sporting goals with high autonomous and low controlled goal motives.

Keywords: goal pursuit, self-concordance, dual career, multiple goals, latent profile analysis

In daily life, the management of goals pursued simultaneously has been described as a juggling act (Louro, Pieters, & Zeelenberg, 2007) and can present significant challenges for individuals. People regularly strive for multiple goals within a single context, such as a basketball player trying to develop their fitness whilst also improving their free-throw percentage, or a student pursuing a goal to achieve specific grades within several academic modules at one time. Equally, goals can be pursued in multiple contexts at the same time; for example a student-athlete trying to maintain their academic performance whilst trying to achieve their sporting goal of reaching major championships. Multiple goal pursuit is challenging, requiring the careful self-regulation of time, energy, and resources in order to bring about successful outcomes in a range of objectives (Riediger & Freund, 2004). Multiple goals can facilitate each other (Riediger & Freund, 2004), however goal conflict, where the pursuit of one goal hinders progress towards another being pursued simultaneously, can have implications for psychological well-being (Gray, Ozer, & Rosenthal, 2017; Kelly, Mansell, & Wood, 2015). Building on this literature, within the present study we examined how the motives underpinning multiple goal pursuit across domains relate to well- and ill-being in student-athletes.

The motives underpinning multiple goal striving - the reasons why individuals are striving for their goals - can explain why some people are more successful in their goal pursuits. In proposing the self-concordance (SC) model, Sheldon and Elliot (1999) suggested that individuals can pursue goals with different goal motives, which may vary in the extent to which they reflect their inherent values and interests. Aligned with the tenets of Self-Determination Theory (SDT; Deci & Ryan, 2000), these motives can be broadly defined as autonomous or controlled. Autonomous goal motives reflect intrinsic or identified motivation regulations, whereby individuals are pursuing goals because of the enjoyment the goal provides, or the personal importance, value or interest in the goal. Conversely, controlled

goal motives are a product of striving due to external (e.g., to obtain rewards, avoid punishment or to gain the approval of others) or internal (e.g., the avoidance of unpleasant emotions such as guilt or anxiety; Sheldon & Elliot, 1999) pressures, reflecting introjected and extrinsic motivation regulations. When proposing the SC model, Sheldon and Elliot suggested that goals pursued with more self-concordant motives (i.e. higher autonomous and lower controlled motives) lead to benefits for goal attainment and psychological well-being.

Research have supported the main tenets of the SC model, in work (Judge, Erez, Bono, & Locke, 2005), education (Gaudreau, 2012; Sheldon & Houser-Marko, 2001), and sport (Gaudreau & Braaten, 2016; Smith, Ntoumanis, & Duda, 2007) contexts. Autonomous goal motives have been found to be associated with a range of self-regulatory processes, including persistence towards an increasingly difficult goal (Ntoumanis, Healy, Sedikides, Duda, et al., 2014), adaptive coping strategies (Sanjuán & Ávila, 2018), and disengagement from unachievable goals to allow for the reengagement in alternative goal pursuits (Ntoumanis, Healy, Sedikides, Smith, & Duda, 2014). Despite the support for the SC model, studies within the goal motives literature (and the motivation literature in general; Gillet & Vallerand, 2016; Wormington & Linnenbrink-Garcia, 2017) have predominantly used variable-centered approaches. Such approaches are important for some research questions, as they allow for the examination of autonomous and controlled motives as independent variables in association with related mediators (e.g. coping strategies, task appraisals) and outcomes (e.g. goal attainment, well-being). However, it is plausible that individuals may pursue important goals with various combinations of *both* autonomous and controlled goal motives, which is difficult to fully examine within a variable-centered approach. A person-centered approach can allow for the naturally occurring combinations of goal motives to be examined in relation to outcomes related to goal pursuit, such as goal attainment and well-being (Wormington & Linnenbrink-Garcia, 2017). Within the context of the present study, a

person-centered approach allows for the examination of how the actual combinations of goal motives with which student-athletes pursue their goals relate to important outcomes in the goal striving process.

To the best of our knowledge, only one study has used a person-centered approach in relation to the motives for goal pursuit. Specifically, Healy, Ntoumanis, and Duda, (2016) used latent profile analysis to create profiles based on student-athletes motives for their academic and sporting goals that they were pursuing simultaneously. They subsequently examined the between-profile differences in inter-goal facilitation (e.g. the extent to which the pursuit of one goal facilitated progress in the other) and interference (e.g. how the pursuit of one goal interfered with the pursuit of the other). Their analyses found support for three distinct profiles of motives, with varying degrees of autonomous and controlled goal motives for both goals. Importantly, the profiles with higher levels of autonomous goal motives experienced higher levels of inter-goal facilitation between their multiple goal pursuits, regardless of their level of controlled goal motives. There were no differences in inter-goal interference; participants across all profiles reported moderate levels of interference between their sporting and academic goals. The authors suggested that more adaptive forms of motivation might not stop goals in multiple domains interfering with each other, whilst recognizing that further studies were needed to fully explore this finding.

Goal Motives and Well-being

In addition to variations in goal motives explaining goal self-regulatory processes, autonomous and controlled goal motives have been found to have different relations with well- and ill-being, often defined as the cognitive and affective evaluations an individual has about their life (Diener, Oishi, & Lucas, 2009). This is of particular relevance within student-athletes, where the competing demands of academic and sporting commitments can have implications for well-being (Cosh & Tully, 2014; van Rens, Ashley, & Steele, 2019).

Autonomous goal motives have been shown to be related to enhanced well-being, both directly (Healy et al., 2014; Miquelon & Vallerand, 2006; Sheldon, Ryan, Deci, & Kasser, 2004) and indirectly through goal attainment (Smith et al., 2007), psychological need satisfaction (Bahrami & Cranney, 2018) and coping strategies (Sanjuán & Ávila, 2018). It has also been shown that autonomous motives can protect against ill-being (Healy et al., 2014; Miquelon & Vallerand, 2006), while controlled motives have been generally negatively or unrelated to well-being, and positively related to ill-being (Gaudreau & Braaten, 2016; Healy et al., 2014).

To the best of our knowledge, no research has examined how profiles of goal motives are related to other outcomes proposed within the SC model, such as indicators of well- and ill-being. This would represent a significant addition to the literature, as it is difficult to examine the implications for well-being when individuals are pursuing goals with high levels of both autonomous and controlled motives using variable-centered approaches. Adopting a person-centered approach allows for the examination of the combinations of goal motivation regulations that lead to the most adaptive outcomes in relation to well-being. Whilst research in the wider SDT literature has shown associations between different motivation profiles and well-being (Broeck, Lens, Witte, & Coillie, 2013; Gustafsson, Carlin, Podlog, Stenling, & Lindwall, 2018), the implications for well- and ill-being when individuals are pursuing goals with different combinations of motives is as yet unknown.

The vast majority of the SC model literature has examined the relations between autonomous and controlled goal motives and well-being in relation to the pursuit of a single goal. However, it is important to examine these relations when individuals are pursuing multiple goals, particularly as a recent meta-analysis showed that goal conflict is associated with poorer psychological well-being (Gray et al., 2017). A notable exception in the literature is the work of Gorges, Esdar, and Wild (2014), who found that junior academics' conflict in

multiple goal pursuits was related to positive affect when goal self-concordance was high. The opposite relation was found for negative affect; goal conflict was related to negative affect when self-concordance was low. However, Gorges and colleagues only examined multiple goal pursuit in one context, whereas the reality is individuals are often pursuing goals across several domains (Louro et al., 2007).

Aims and hypotheses

This study expands on the research by adopting a person-centered approach to examine relations between the motives for multiple goals and well-being. Our specific aim was to examine how motives for simultaneously pursued academic and sporting goals relate to student-athletes' well- and ill-being, using a person-centered approach. Based on previous literature, we formulated two hypotheses. First, based on literature exploring goal specific and global motivation (e.g., Healy et al., 2016; Langan et al., 2016), we expected that students would pursue their academic and sporting goals with a diverse range of goal motives. Second, we expected that variations in the goal motives across these profiles would explain differences in indicators of well- and ill-being. Specifically, we anticipated that profiles where participants reported better quality goal motives for their sporting and academic goals (i.e., higher autonomous and lower controlled motives) would have higher well- and lower ill-being than participants in profiles with less optimal motives (i.e., higher controlled, lower autonomous motives).

Materials and Methods

Participants

We recruited 362 student-athletes (202 male, 160 female, *M*age = 20.35 *SD* = 2.03 years) from eight British universities. Students needed to be formally registered as a student at the university, and represent their university in British University and College Sport (BUCS) competitions. The student-athletes came from a range of team (*n* = 253; e.g. hockey)

and individual (n = 109; e.g. golf) sports, had been competing in these sports on average for 9.55 years (SD = 4.45), and competed at university (n = 112), county (n = 41), regional (n = 52), national (n = 72) and international (n = 78) levels of competition (seven athletes did not respond). One hundred and fourteen athletes (32.2% of the sample) received a scholarship for their studies based on their athletic performance.

Measures

Personal goal motives. Student-athletes identified their most important goal for both their sporting and academic pursuits that they were currently working towards, and would continue to work towards over the academic year. Athletes were given no instruction on the types of goals (i.e. performance, process, outcome goals) they should report. Athletes subsequently rated their personal goal motives for each of these goals, using four items from previous goal motives research (Sheldon & Elliot, 1999). Specifically, participants rated on a 1 (*Not at all*) to 7 (*Very much so*) scale the extent to which they were pursuing each goal with extrinsic ("Because someone else wants you to"), introjected ("Because you would feel ashamed, guilty, or anxious if you didn't"), identified ("Because you personally believe it's an important goal to have") and intrinsic ("Because of the fun and enjoyment the goal provides you") motives.

Well- and ill-being. We used a range of measures in order to assess different aspects of well- and ill-being. We measured vitality (a measure of organismic well-being defined as a " positive feeling of aliveness and energy"; Ryan & Frederick, 1997, p.529) using the five-item Subjective Vitality Scale which has been used in previous literature (e.g., Bostic, Doris, & Hood, 2000; Rouse et al., 2015). These items (e.g. "I have energy and spirit") were assessed on a 1 (*Not true at all*) to 7 (*Very True*) Likert scale. As a measure of psychological well- and ill-being, positive (four items; "happy", "joyful", "pleased", "enjoyment/fun") and negative affect (five items; "frustrated", "depressed/blue", "unhappy", "angry/hostile",

"worried/anxious") were measured using items developed by Diener and Emmons (1984). Finally, physical ill-being was measured using the Physical Symptoms Checklist (10 symptoms e.g. "Headache"; Emmons, 1991). The affect items and Physical Symptoms Checklist were both measured on a 1 (*Not at all*) to 7 (*All the time*) Likert scale. For all of the well- and ill-being measures, participants were asked to respond in relation to their general experience (i.e. not domain specific) over the past week.

Procedure

Following institutional ethical approval from the first author's institution (Non-Invasive Human Ethics Committee application number 17/18-08), participants were recruited through contact with sport administrators, coaches and captains. Arrangements for data collection were made via these individuals, which included participants completing a battery of questionnaires either online (using the Survey Monkey and JISC online platforms) or in person (e.g. before a training session). Data were collected over several academic years from 2013 to 2020. Regardless of how the data were collected, all participants were provided with information about what their participation involved, including that their participation was voluntary and of their right to withdraw from the study. All participants provided informed consent prior to completing the questionnaire measures, which took around 15 minutes to complete. Participants received no form of compensation for their involvement in the study.

Data analysis

Descriptive statistics and bivariate correlations were performed using SPSS Version 26 (IBM Corp., 2019). We conducted our primary analyses using MPlus software (Version 8.0: Muthén & Muthén, 1998-2012). To create goal motives profiles, we used Latent Profile Analysis (LPA) using the maximum likelihood (ML) estimation. This approach allows for the determination of profiles based on a combination of goodness-of-fit indices, theoretical considerations and the nature of the classes (Gerber, Jonsdottir, Lindwall, & Ahlborg, 2014),

as well as testing if a more complex model offers a better solution to the data than one which is more parsimonious. This analytic approach is appropriate for sample sizes of at least 100 participants (Williams & Kibowski, 2016). We used the four motivation regulations for both the academic and sporting goal, resulting in eight variables in total.

We conducted analyses exploring three up to seven class solutions. To determine the optimum number of classes, we primarily used the bootstrapped log-likelihood ratio test (BLRT) as this has been shown to be more effective for smaller sample sizes (Nylund, Asparouhov, & Muthén, 2007). We looked for a statistically significant ($p < .05$) BLRT value to indicate that a model offered a better solution than a model with one less profile specified. Additionally, we examined the Bayesian Information Criteria (BIC) and sample-size adjusted BIC (SSA-BIC); lower values indicate better model fit. We also used the entropy criterion, with values closer to 1 indicating a more accurate solution (Aldridge & Roesch, 2008; Berlin, Williams, & Parra, 2014). Finally, we examined the conceptual plausibility of the profiles generated within each model, in relation to our theoretical underpinnings. We avoided solutions with small profiles, as they can present issues relating to power and precision (Berlin et al., 2014).

We utilized the AUXILIARY function within MPlus (Muthén & Muthén, 1998-2012) to examine between-profile differences in well- and ill-being. This approach uses a Wald chi-square test and pairwise comparisons to analyze the between-profile differences in the mean values for our outcome variables. We adjusted for multiple comparisons through false positive rate control using the Benjamini-Hochberg procedure (Benjamini & Hochberg, 1995; Glickman, Rao, & Schultz, 2014), and set the false positive rate to $d = .10$ (McDonald, 2014).

Results

Preliminary Analyses and Descriptive Statistics

Participants identified a range of sporting (e.g. “To get my highest goal count”, “To play for my country”, “To increase strength and fitness”) and academic (e.g. “Graduate with 1st class honours”, “Get my first major research project published”, “Pass the year”) goals. Following data entry, we screened the data for missing values. Two participants were removed as their responses revealed that they did not compete in BUCS competitions (i.e. they identified their main sport as gym exercise, and their sporting goal related to exercise performance). Three participants failed to complete all of the goal motives items. Given the importance of these values to our main analyses, we removed these participants from the sample. Three further participants were removed as they had failed to complete any of the measures of well- and ill--being. We checked for multivariate outliers using Malhalanobis’ distance (Tabachnick and Fidell, 2014). Five participants were potential outliers; however the Cook’s distance for all of these participants was less than 1. Aligned with established guidelines and previous research (Gustafsson et al., 2018; Tabachnick & Fidell, 2014) we chose not to remove these participants from the sample. This left a total sample of 354 participants.

While goal motives research has generally examined data from team and individual athletes within the same analyses, based on the suggestion of an anonymous reviewer we explored if there were any differences in goal motive regulations across the different sport types within our sample. Given the range of sports included, we classified athletes into team and individual sports, and conducted a one-way multivariate analysis of variance (MANOVA) on the goal motives regulations. This revealed significant multivariate (Pillai’s $V = .07$, F (8, 345) = 3.22, p = .002, partial $\eta^2 = .07$) and univariate between group differences for the extrinsic (F (1, 352) = 5.74, p = .02, partial $\eta^2 = .02$) and introjected (F (1, 352) = 6.65, p = .01, partial $\eta^2 = .02$) motives for the sporting goal, and the introjected (F (1, 352) = 13.10, p < .001, partial $\eta^2 = .04$) and intrinsic (F (1, 352) = 3.86, p = .05, partial $\eta^2 = .01$)

motives for the academic goal. Therefore, within our main analyses we included sport type as a categorical variable to examine if there were any differences across the profiles.

<INSERT TABLE 1 ABOUT HERE>

The descriptive statistics, scale reliabilities and bivariate correlations are displayed in Table 1. All multi-item measures demonstrated reliability (Cronbach α) above .70. Overall, participants were pursuing their sporting goals with low extrinsic and introjected, and high identified and intrinsic motives. There were more diverse motives for the academic goal. Participants reported very high identified motives for their academic goal, along with moderate intrinsic and introjected, and low extrinsic goal motives. Participants overall reported higher well-being and lower ill-being.

<INSERT TABLE 2 ABOUT HERE>

Latent Profile Analysis

Based on the BLRT, BIC, SSA-BIC and entropy (Table 2), there was no clear cut-off in terms of the number of potential classes; each new solution with one more profile offered a better fit for the data. The BLRT was statistically significant for all analyses. However, when running the seven profile solution the best likelihood value was not replicated even when increasing the number of random starts, and inspection of this solution showed one class with a small number of participants (n = 16; <5% of sample). Based on this, the better BLRT, entropy values and the goal motive regulations in the different profiles, we accepted the solution with six classes as our final model.

The motivation regulations for each of the six latent profiles are displayed in Figure 1, expressed as standardized z-scores in relation to the sample mean of 0. There are no clear criteria within the literature for high and low values, therefore we followed an approach adopted by other studies (e.g., Gustafsson et al., 2018) when interpreting the nature of the profiles. Specifically, we classified values of ± 1 SD as very high/low, ± 0.5 to 1 SD as

high/low, and -0.5 to 0.5 SD (encompassing 0) as above/below average. The classes are presented in order from least to most adaptive, in line with our theoretical expectations. Within the first class (*n* = 34; 9.6% of the sample), participants reported very high extrinsic, and high introjected motives for both goals. Identified motives for the sporting goal were above average, whereas the intrinsic motives for the sporting goal, and both the identified and intrinsic motives for the academic goal were below average. Therefore, this class was labelled "High Controlled Strivers". Class 2 (*n* = 20, 5.6%) was labelled as "Low Autonomous Strivers", as within this class participants had below average intrinsic and low identified motives for the academic goal, as well as very low identified and intrinsic motives for the sporting goal. Participants also reported high extrinsic and very high introjected motives for the sporting goal. The extrinsic and introjected motives for the academic goal were below and above average, respectively. Participants within Class 3 (*n* = 32; 9%) reported lower than group mean values for all goal motive regulations for both goals; thus this profile was named "Low Motive Strivers". Class 4 contained the largest number of participants (*n* = 118; 33.3%) and presented a somewhat mixed profile. Extrinsic motives for the sporting goal were low, introjected motives for the academic goal were high, and all of the other goal motive regulations for both goals were above average, with the exception of intrinsic motives which were below average. Therefore, this profile was named "Mixed Motive Strivers". Class 5 (*n* = 68; 19.2%) was labelled "High Motive Strivers", as for both goals all of the goal motive regulations were above the group mean. Extrinsic motives for both goals were high, whilst all of the other goal motives were above average. Finally, Class 6 (*n* = 82; 23.2%) had below average to low controlled (e.g. extrinsic and introjected) and above average autonomous (e.g. identified and intrinsic) motives for both goals. As such, we named this profile "Self-Concordant Strivers". We deemed the "Self-Concordant Strivers" to be the most optimal motivational profile, given the relative high autonomous and low

controlled motives for both goals. Both the "High Controlled Strivers" and the "Low Autonomous Strivers" were deemed to be of the poorest motivational quality; the former because of the high controlled motives and the latter because of the low autonomous motives for both goals.

In relation to sport type (i.e., team or individual), the results showed that participants in the "Self-Concordant Strivers" class were more likely to be from an individual sport than those in the "Mixed Motive Strivers" class (OR = 2.46, 95% CI [0.90, 4.67], p = .01), the "High Motive Strivers" class (OR = 1.95, 95% CI [0.70, 3.78], p = .01) and the "High Controlled Strivers" (OR = 2.76, 95% CI [0.72, 6.48], p = .05). The "Mixed Motive Strivers" were less likely to be from an individual sport than the "Low Motive Strivers" (OR = 0.32, 95% CI [0.09, 0.74], p = .05) and the "High Motive Strivers" (OR = 0.79, 95% CI [0.29 – 1.50], p = .01). Within the latter two classes, the "Low Motive Strivers" were more likely to be from an individual sport than the "High Motive Strivers" (OR = 2.47, 95% CI [0.65 – 5.89], p = .05).

<INSERT FIGURE 1 ABOUT HERE>

Between-Class Analyses

Visual inspection of the mean well- and ill-being values (Table 3) across the classes revealed that the "Self-Concordant Strivers" had the highest well- and lowest ill-being scores respectively. Conversely, the "Low Autonomous Strivers" reported the lowest well- and highest ill-being scores across the classes. These descriptive findings were supported by the results of the AUXILIARY analyses, which revealed between-class differences for all of the indicators of well- and ill-being. In relation to well-being, the "High Motive Strivers" (Wald χ^2 = 11.84, p = .001, Hedges' g = .92), the "Self-Concordant Strivers" (Wald χ^2 = 21.09, p < .001, Hedges' g = .96) and the "Mixed Motive Strivers" (Wald χ^2 = 6.70, p = .01, Hedges' g = .57) all reported significantly higher subjective vitality than the "Low Autonomous

Strivers" class (Global Wald $\chi^2 = 25.97$, $p < .001$). For positive affect (Global Wald $\chi^2 = 14.96$, $p = .01$), the "High Motive Strivers" (Wald $\chi^2 = 7.03$, $p = .008$, Hedges' $g = 81$), the "Self-Concordant Strivers" (Wald $\chi^2 = 10.98$, $p = .001$, Hedges' $g = .91$), and the "Mixed Motive Strivers" (Wald $\chi^2 = 5.72$, $p = .02$, Hedges' $g = .62$) reported significantly higher positive affect than the "Low Autonomous Strivers".

For the indicators of ill-being, the participants in the "Low Autonomous Strivers" class reported significantly higher negative affect than the "Low Motive Strivers" (Wald $\chi^2 = 6.28$, $p = .01$, Hedges' $g = .70$) and the "Self-Concordant Strivers" (Wald $\chi^2 = 12.41$, $p < .001$, Hedges' $g = .88$). The "Self-Concordant Strivers" also reported lower negative affect than the "Mixed Motive Strivers" (Wald $\chi^2 = 9.38$, $p = .002$, Hedges' $g = .47$), the "High Controlled Strivers" (Wald $\chi^2 = 14.28$, $p < .001$, Hedges' $g = .74$) and the "High Motive Strivers" (Wald $\chi^2 = 6.04$, $p = .01$, Hedges' $g = .40$; Global Wald $\chi^2 = 24.30$, $p < .001$). For physical symptoms of ill-being, the "Self-Concordant Strivers" reported significantly lower symptoms than the "High Motive Strivers" (Wald $\chi^2 = 8.28$, $p = .004$, Hedges' $g = .47$) and the "High Controlled Strivers" (Wald $\chi^2 = 6.34$, $p = .01$, Hedges' $g = .49$; Global Wald $\chi^2 = 15.62$, $p = .008$).

<INSERT TABLE 3 ABOUT HERE>

Discussion

The aim of the present study was to examine, using a person-centered approach, how profiles of academic and sporting goal motives relate to student-athletes well- and ill-being. We hypothesized that 1) student athletes would pursue their academic and sport goals with a broad range of goal motives and 2) more adaptive motivational profiles (i.e., higher autonomous and lower controlled goal motives) would be associated with higher and lower well- and ill-being respectively, and our findings support these hypotheses. Within our sample, there were six distinct goal motives profiles with student-athletes across these

profiles reporting a wide range of goal motives for their sporting and academic goals. The profiles found in the present study are more diverse than those found within the previous literature (Healy et al., 2016), with greater distinction between the quality and quantity of motivation for both the sporting and academic goals. Within the wider SDT literature, person-centered research examining the motivation regulations for engagement in sporting and other contexts has shown variations across samples, both in relation to the number of profiles identified, and the composition of those profiles (Gillet, Berjot, Vallerand, Amoura, & Rosnet, 2012; Gustafsson et al., 2018; Wang, Morin, Ryan, & Liu, 2016). Thus, it is perhaps not surprising that that the goal motives profiles identified within the present research differ from those within the extant literature.

The profiles found within the present study do highlight some interesting aspects about how student-athletes pursue their goals. It is surprising to observe that the profile representing the largest number of participants reported mixed goal motives for both of their goals, and less than a quarter of the student-athletes reported optimum motivation for both goals. While not examined within the context of this study, the previous literature has shown that the motives underpinning goal pursuit can have important implications for goal attainment (Bahrami & Cranney, 2018; Gaudreau & Braaten, 2016; Ntoumanis, Healy, Sedikides, Duda, et al., 2014; Smith et al., 2007). As such, it is important to consider whether, within the context of U.K. university sport, student-athletes may need support from coaches, lifestyle advisors and academic staff to pursue both their academic and sporting goals with the most adaptive of motives.

In relation to our second hypothesis, we found variations across the goal motives profiles for all of the indicators of well-and ill-being in line with our expectations. The profile with the most optimal motives for goal pursuit (i.e., the “Self-Concordant Strivers”) reported higher well-being than the profiles with low autonomous (i.e., the “Low Autonomous

Strivers") or high controlled motives (i.e., the "High Controlled Strivers"). It is interesting to note that profiles with above average autonomous motives for at least one of their goals (i.e., the "Mixed Motive Strivers" and "High Motive Strivers") also largely reported higher well-being than profiles with lower autonomous motives, despite also having above average controlled motives for at least one goal. However, it does appear that there is a limit to these benefits, as while the "Mixed Motive Strivers" and "High Motive Strivers" reported better well-being than the least optimal profiles, their levels were significantly lower than the "Self-Concordant Strivers". Our findings relate to previous multiple goals research which suggested that having higher autonomous motives for a least one goal can have benefits for well-being (Gorges et al., 2014), and provide further support for adopting person-centered approaches to examine motivation for goal pursuit (Gillet & Vallerand, 2016). The findings also broadly align with the wider motivation literature (e.g., Langan et al., 2016) that has suggested controlled motivation is not necessarily detrimental to well-being, as long as it is accompanied by high levels of autonomous motivation. However, our results do suggest that these benefits only exist when making comparisons with profiles with poorer quality of motivation. Thus, in order to experience the greatest benefits for well-being, it is important that student-athletes are supported to pursue their academic and sporting goals with the highest quality of motives (i.e., high autonomous and low controlled).

In relation to ill-being, we found that the most optimal profile reported the lowest levels of negative affect and physical symptoms, which were significantly lower than the least optimal profiles. This supports previous research which has shown that autonomous goal motives can provide a buffering effect on ill-being (Healy et al., 2014; Sanjuán & Ávila, 2018). However, our results extend the literature in this area, as our person-centered approach has identified that this buffering effect only occurs when levels of controlled motives are low in relation to autonomous motives. The "Mixed Motive Strivers" and the "High Motive

Strivers" both reported above average autonomous motives, but also above average to high controlled motives for at least one of their goals, and reported significantly higher levels of ill-being than the "Self-Concordant Strivers" who had above average autonomous motives and below average to low controlled motives for both goals. This finding might be explained by goal ambivalence, defined as mixed feelings or thoughts about pursuing a goal, which has been shown to mediate the relationship between goal self-concordance and well-being (Koletzko, Herrmann, & Brandstätter, 2015). As such, it is plausible that when student-athletes have mixed feelings about the reasons why they are pursuing their goals there are consequences for their ill-being.

A further interesting finding in relation to ill-being is that "Low Motive Strivers" reported lower levels of negative affect than the "Low Autonomous Strivers", despite reporting low levels of all goal motive regulations for both goals. This could be explained in two ways. On one hand, it could be that the relatively low levels of controlled goal motives reported by participants in this profile results in fewer negative thoughts associated with goal pursuit. Alternatively, the low levels of all goal motivation regulations could be reflective of low commitment to both their academic and sporting goals (Klein, Wesson, Hollenbeck, & Alge, 1999). Thus, they may be less likely to experience challenges in the management of these goals, in comparison to other profiles who may have higher levels of (suboptimal) goal motives. However, given our research is the first to examine how different combinations of goal motives for multiple goals are associated with well- and ill-being, it is important that further research is conducted to replicate our findings within different populations.

A surprising finding from our research, which was not originally part of our research question, relates to the differences in goal motives reported in student-athletes from team and individual sports. To the best of our knowledge, research has generally found that motivation regulations are not a function of sport type (Gillet, Berjot, & Rosnet, 2009), however our

study has shown that athletes from individual sports were more likely to belong to specific profiles, including the one deemed most optimal for goal pursuit and well-being. While unexpected, this finding may be explained by the contextual differences experienced in goal pursuit, as it is suggested both theoretically (Deci & Ryan, 2000; Duda, 2013; Mageau & Vallerand, 2001) and empirically (Adie, Duda, & Ntoumanis, 2008; Amorose & Anderson-Butcher, 2015; Healy et al., 2014; Smith, Ntoumanis, Duda, & Vansteenkiste, 2011) that motivation can be influenced by aspects of the social environment. It is possible that the differences in the social environment between team and individual sports influenced the motives with which student-athletes were pursing their goal. Equally, it has been shown that both goals and their underpinning motives can be influenced by others (Aarts, Gollwitzer, & Hassin, 2004; Ntoumanis, Healy, Sedikides, Duda, et al., 2014). Therefore, it may be that for at least their sporting goals, team sport athletes were either pursing goals that they were less personally invested in (i.e., team goals that were not important to the individual), or their goal motives were influenced by team mates with suboptimal motives. These findings warrant further investigation in future studies.

Limitations and Future Directions

This research is an important addition to the literature, given the lack of person-centered studies in goal motives research. We have extended the knowledge in this area by examining how profiles of motives for multiple goals are associated with indicators of well- and ill-being when pursuing goals in different domains, using a sample of student-athletes competing at a very high standard of competition. Despite this and other strengths of our research, including the use of validated measures and our sophisticated analytical strategy, some limitations should be acknowledged. First, the cross-sectional nature of our data means that it is hard to draw conclusions about the longer-term implications of pursuing multiple goals with the various profiles of motives discovered in the present study. Extending the

present research over the course of a competitive season or academic year would give a greater insight into the experiences of student-athletes simultaneously pursuing their academic and sporting goals. Research has not examined the replicability or stability of goal motives profiles, nor which combination of motives lead to the attainment of multiple goals. As such, there would be significant merit in future studies attempting to replicate profiles within the same student athletes from one year to the next. This is particularly important given the theoretical assumptions that goal motives are dynamic and influenced by the social environment; for instances it is plausible that the change in motive may be different across different athletes or different sports. Latent Profile Transition Analysis (LPTA), an analytical technique which allows for the examination of profiles across time and has recently been applied within sporting contexts (Martinent & Decret, 2015), may be a useful way to address the limitations within our work.

A second limitation of our work relates to the goal motives measures used in the study. These single-item measures have been used extensively in the goal striving literature (Gillet, Lafrenière, Huyghebaert, & Fouquereau, 2015; Judge et al., 2005; Sheldon & Elliot, 1999). However, using single-item measures may be problematic, as we are not able to assess the internal reliability of the measures and these items may be vulnerable to measurement error. Nevertheless, the correlations between the different goal motives in the present study were consistent with the existing theoretical and empirical research. In light of this potential issue for our own work and the literature in general, future research may wish to develop a multiple-item questionnaire that allows for the in-depth exploration of each goal motivation regulation.

The final limitation relates to our study and the literature as a whole. To the best of our knowledge, no studies have been conducted to develop, apply and evaluate interventions that support athletes to pursue their goals with the most optimal motivation. Research has

shown that goal motives can be influenced by others within the social environment, such as coaches and teammates (Healy et al., 2014; Ntoumanis, Healy, Sedikides, Duda, et al., 2014; Smith, Ntoumanis, & Duda, 2010). However, no research demonstrates the mechanisms through which individuals can become more autonomous in their goal motives. Furthermore, research could investigate if intervening to promote more adaptive goal striving in one domain (e.g. sport) could have beneficial effects for goal pursuits in another domain (e.g. education). Such studies would be important for the literature and would have widespread practical implications.

In addition to the avenues already outlined, future research can further develop the understanding of effective goal pursuit in several ways. For example, it would be worthwhile to explore motives for single goals using a person-centered approach, given that the present study and previous research (Healy et al., 2016) shows that individuals can pursue multiple goals with a range of goal motives profiles. Additionally, there are other aspects of goal self-regulation, such as goal adjustment, the disengagement from unattainable goals and reengagement in alternative goals (Lebeau et al., 2018; Ntoumanis, Healy, Sedikides, Smith, et al., 2014; Smith & Ntoumanis, 2014), which have been linked to differences in individual goal motives. As such, it would be worthwhile for research to examine how person-centered examinations of goal motives can explain differences in a range of self-regulatory processes, including the self-regulation of multiple goals. For instance, it would of interest to understand if the motives underpinning goal pursuit can predict whether individuals can disengage from one goal in order to increase the likelihood of attaining another goal being simultaneously pursued (c.f. Ntoumanis & Sedikides, 2018). Finally, given that goal motives have been shown to be influenced by important others, including coaches (Healy et al., 2014; Smith, 2016) and other individuals engaged in goal pursuit (Ntoumanis, Healy, Sedikides, Duda, et al., 2014), it would also be worthwhile to examine these variables as predictors of profile

membership. Of particular relevance to the present study would be exploring if student-athletes are more likely to have adaptive motives for both their sporting and academic goals if their coach uses an interpersonal style which is high in needs-supportive (Mageau & Vallerand, 2001) and low in need thwarting (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010) behaviors.

Conclusion

To conclude the present study has extended the goal motives and multiple goal literature by demonstrating how different profiles of student-athletes academic and sporting goal motives relate to indices of well- and ill-being. Specifically, in order to promote benefits for well-being, it is important that student-athletes are pursuing both goals with higher autonomous, and lower controlled goal motives. Furthermore, high autonomous goal motives cannot protect well-being for student-athletes when controlled goal motives are also high.

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Table 1.

Descriptive Statistics, Internal Reliabilities, and Bivariate Correlations among Study Variables

		M	*SD*	α	1	2	3	4	5	6	7	8	9	10	11
1.	Sport Extrinsic Goal Motives	2.25	1.52	-	-										
2.	Sport Introjected Goal Motives	2.97	1.74	-	.43***	-									
3.	Sport Identified Goal Motives	5.61	1.30	-	.01	-.004	-								
4.	Sport Intrinsic Goal Motives	5.90	1.18	-	-.15**	-.16**	.38***	-							
5.	Academic Extrinsic Goal Motives	2.77	1.74	-	.49***	.30***	.07	.05	-						
6.	Academic Introjected Goal Motives	4.14	1.86	-	.27***	.54***	.03	-.08	.49***	-					
7.	Academic Identified Goal Motives	5.95	1.17	-	-.08	.02	.28***	.11*	-.09	.06	-				
8.	Academic Intrinsic Goal Motives	4.22	1.72	-	-.03	.01	.12*	.22***	-16**	-.11*	.38***	-			
9.	Physical Symptoms	2.59	1.00	.79	.18***	.17**	.03	-.08	.12*	.14**	-.02	-.06	-		
10.	Subjective Vitality	4.33	1.23	.91	-.12*	-.13**	.08	.22***	-.09	-.24***	.04	.23***	-.30**	-	
11.	Positive Affect	5.02	1.04	.88	-.09	-.13*	.16**	.32***	.03	-.16**	.12*	.16**	-.08	.64***	-
12.	Negative Affect	3.16	1.29	.84	.16**	.19***	-.02	-.19**	.19**	.24***	-.08	-.07	.47***	-.44***	-.35***

Note: * $p < .05$, ** $p < .01$, ** $p < .001$

Table 2.

Fit Indices, Entropy, and Model Comparisons for Estimated Latent Profile Analysis Models

Model	BLRT	BIC	SSA-BIC	Entropy	LMR
Three classes	<.001	10563.39	10446.01	.79	.007
Four classes	<.001	10510.74	10361.64	.82	.09
Five classes	<.001	10491.38	10310.55	.84	.39
Six classes	<.001	10465.18	10252.63	.87	.25
Seven classes	<.001	10450.136	10205.86	.89	.41

Note. BLRT = Boostrapped loglikelihood ratio test significance value; BIC = Bayesian Information Criterion; SSA-BIC = Sample Size Adjusted Bayesian Information Criterion; LMR = Lo-Mendell-Rubin likelihood ratio test significance value.

Table 3.

Wald chi-square test vales, means and standard deviation of indices of well- and ill- being for each of latent profiles.

	Global χ^2	Class 1 High Controlled Strivers n = 34 M(SEM)	Class 2 Low Autonomous Strivers n = 20 M(SEM)	Class 3 Low Motive Strivers n = 32 M(SEM)	Class 4 Mixed Motive Strivers n = 118 M(SEM)	Class 5 High Motive Strivers n = 68 M(SEM)	Class 6 Self-Concordant Strivers n = 82 M(SEM)	Summary
Subjective Vitality	25.97**	3.95(.22)	3.43(.26)	4.28(.25)	4.17(.1)	4.45(.13)	4.84(.17)	2<4,5,6; 1,4<6
Positive Affect	14.96*	4.81(.19)	4.27(.29)	4.79(.20)	5.02(.11)	5.11(.12)	5.32(.12)	2<4,5,6
Physical Symptoms	15.16**	2.85(.17)	2.98(.27)	2.36(.20)	2.56(.11)	2.81(.12)	2.32(.12)	1,5<6
Negative Affect	24.30**	3.66(.22)	3.89(.32)	2.85(.27)	3.33(.14)	3.17(.15)	2.64(.16)	2>3,6; 1,4,5>6

Note. Summary indicates significantly different means when applying the Benjamini Hochberg procedure $d = .10$. * = $p < .05$, ** = $p < .01$.

Profiles are presented from left to right from the least to most adaptive goal motivation regulations.

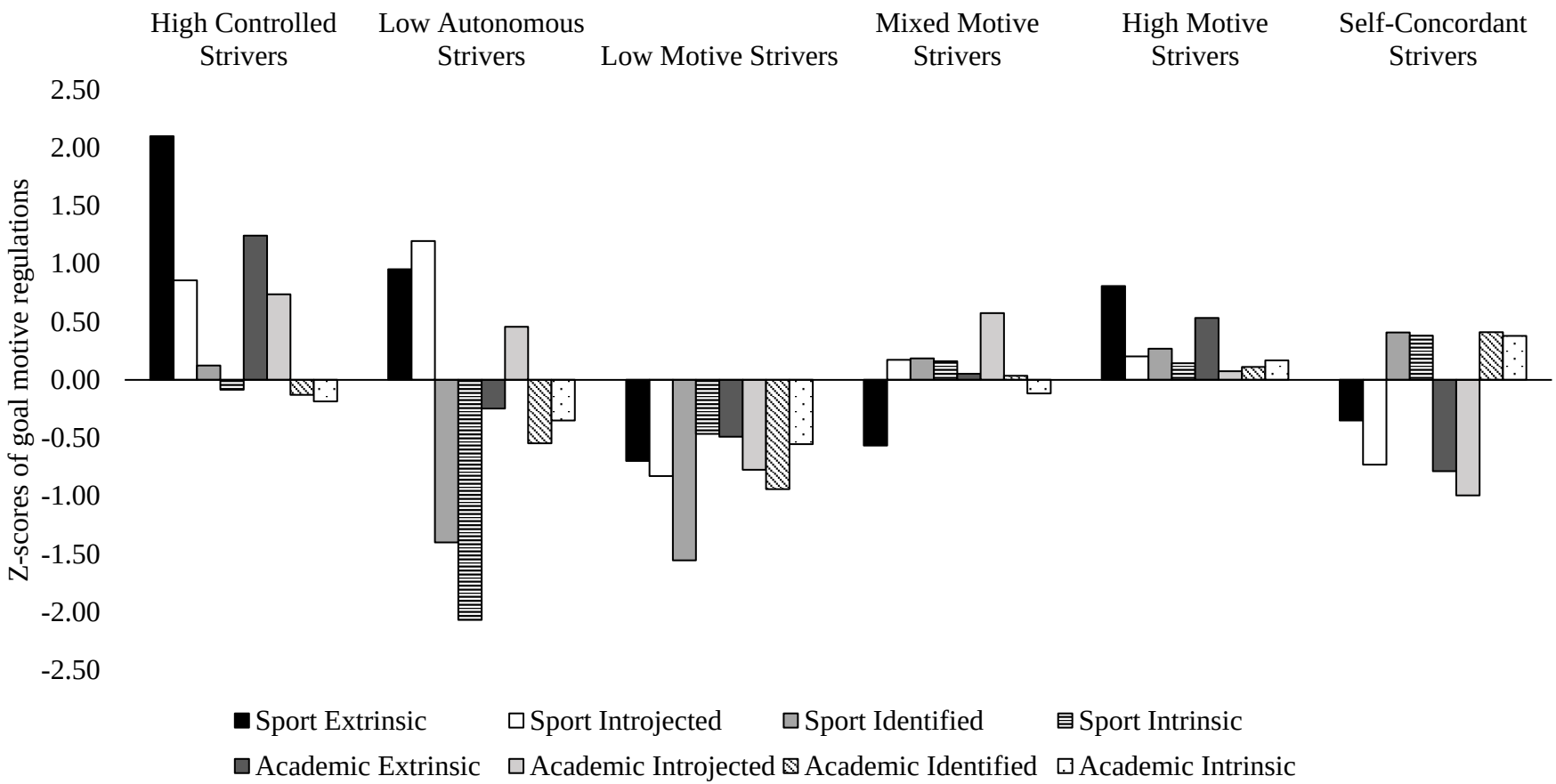

Figure 1. Graphical representation of the sporting and academic goal motivation regulations for the six identified profiles. Values for each goal motives are expressed as z scores in relation to the sample mean. Profiles are presented from left to right from the least to most adaptive goal motivation regulations.