

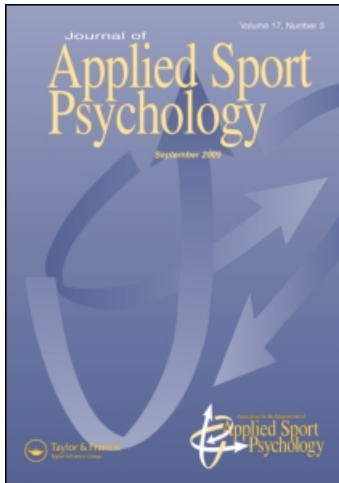
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### An Investigation of Coach Behaviors, Goal Motives, and Implementation Intentions as Predictors of Well-Being in Sport

Alison Smith <sup>a</sup>; Nikos Ntoumanis <sup>a</sup>; Joan Duda <sup>a</sup>

<sup>a</sup> University of Birmingham,

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## **An Investigation of Coach Behaviors, Goal Motives, and Implementation Intentions as Predictors of Well-Being in Sport**

ALISON SMITH, NIKOS NTOUMANIS, AND JOAN DUDA

*University of Birmingham*

The present study aimed to expand upon Smith, Ntoumanis, and Duda's (2007) research by investigating the influence of coach behaviors and implementation intentions on goal striving in sport. Structural equation modeling analysis with a sample of 108 athletes revealed coach behaviors as predictors of goal motives, which in turn predicted psychological well-being after 8 weeks. Supplementary regression analyses showed no interaction between autonomous goal motives and implementation intentions; however, a synergistic effect was identified for controlled goal motives such that controlled motives furnished with implementation intentions resulted in lower well-being than controlled motives alone. In further analyses, the motives underlying an implementation intention were found to mediate the paths from goal motives to well-being. The findings are discussed in terms of the roles played by goal motives, implementation intentions, and implementation intention motives during goal striving.

### **INTRODUCTION**

Despite empirical evidence supporting the motivational benefits of goal-setting in sport (e.g., Weinberg, Burke, & Jackson, 1997), anecdotal reports suggest that coaches and athletes struggle to use goal-setting optimally (Burton, Weinberg, Yukelson, & Weigand, 1998). Extending previous goal-related research in sport, Smith, Ntoumanis, and Duda (2007) used the self-concordance model (Sheldon & Elliot, 1999) as a conceptual framework for understanding the volitional components underlying goal striving, and their implications for goal attainment and psychological well-being. The present study aimed to further examine the influence of personal goal motives upon goal progress and well-being by looking at the function of coach behaviors, implementation intentions, and the motives underlying implementation intentions.

Until recently, goal-setting research in sport has largely neglected the volitional processes underlying athletes' goal striving, focusing instead upon the motivational benefits of goal-setting and the optimization of goal characteristics (e.g., goal specificity; Locke & Latham, 1985). In an effort to understand the volitional underpinnings of athletes' goal striving, Smith et al. (2007) and Smith, Ntoumanis, Duda, and Vansteenkiste (2009) applied and found support for the self-concordance model in relation to sport-specific goal striving. The self-concordance model (Sheldon & Elliot, 1999) addresses the motivational processes underlying personal goal striving, referring to the period between goal adoption and goal attainment. The model additionally considers the implications of goal attainment for psychological well-being. Consistent with the self-determination theory continuum (Deci & Ryan, 1985), Sheldon

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Address correspondence to Alison Smith, School of Sport and Exercise Sciences, University of Birmingham, Edgbaston, Birmingham, B15 1TT. E-mail: als510@bham.ac.uk

and Elliot proposed that the motives underlying personal goal striving can be differentiated according to their degree of internalization within the self. Furthermore, Sheldon and Elliot advocated that goal striving that is regulated by relatively more internalized, or autonomous, motives underpinned by enjoyment (intrinsic motives) or perceived value (identified motives), in contrast to that which is controlled by internal or external pressures (introjected and external motives, respectively), is more beneficial in terms of goal attainment and psychological well-being. A more detailed presentation of the self-concordance model, and its grounding in self-determination theory, has been presented by Smith et al. (2007).

Prompted by support found for the application of the self-concordance model to context-specific goal striving (e.g., Judge, Bono, Erez, & Locke, 2005), Smith et al. (2007) employed a cross-sectional design to test a sport-specific adaptation of the self-concordance model with a sample of 210 British university athletes. Unlike Sheldon and Elliot (1999) who used a relative autonomy index (autonomous minus controlled motives), Smith et al. (2007) employed separate autonomous and controlled goal motive factors to avoid obscuring their potential independent contributions. Consistent with Sheldon and Elliot's (1999) findings pertaining to the relative index, Smith et al. (2007) reported that autonomous goal motives positively predicted goal-directed effort ( $\beta = .71$ ) which, in turn, predicted goal attainment ( $\beta = .58$ ). Goal attainment was positively associated with a composite score reflecting the satisfaction of the basic psychological needs for autonomy, competence, and relatedness ( $\beta = .45$ ), which in turn, consistent with self-determination theory, was positively related to psychological well-being ( $\beta = .45$ ). Controlled goal motives were not found to predict any of the goal-related variables in the adapted model, but were directly and negatively linked to well-being ( $\beta = -.30$ ). In a further development of the model, Smith et al.'s (2007) contextual adaptation assessed the role of coach autonomy support as a predictor of goal striving. The findings revealed positive paths from autonomy support to both autonomous goal motives ( $\beta = .33$ ) and need satisfaction ( $\beta = .64$ ), and highlighted the importance of considering the role of the coach when examining goal striving in sport. Smith et al. (2007), however, did not examine the potential implications of controlling coach behaviors. Mageau and Vallerand (2003) proposed that controlling behaviors, such as the use of controlling statements (e.g., "you have to win this game") and punishments (e.g., additional physical workout given as a result of failure to win), may threaten the development of autonomous contextual motivation in sport through minimizing opportunities for choice and volition. Nevertheless, the independent effects of such behaviors upon athletes' motivation, and particularly upon athletes' goal striving, have largely been ignored.

In a more recent study, Smith and colleagues (2009) demonstrated support for their adapted model using a longitudinal design. The study, assessing a sample of 97 British athletes at the beginning, mid, and end of their sport season, once again advocated the benefits of striving for sport-specific goals with autonomous motives, for both goal attainment and changes in psychological well-being. The data also revealed a moderation of the attainment-well-being link by autonomous goal motives, as predicted by Sheldon and Elliot (1999).

The support offered for the sport-specific adaptation of the self-concordance model in the Smith et al. (2007, 2009) studies offers the possibility of considering further questions regarding factors that optimize or undermine goal striving in sport. The present study focuses upon two such factors, implementation intentions and the motives that underlie these intentions.

### **Implementation Intentions**

Implementation intentions are a cognitive self-regulatory strategy designed to aid goal progress by strengthening the relationship between goals and the actions required to attain them

(Gollwitzer, 1993, 1999). Differing from goal intentions, which reflect the desired endpoint of goal striving, implementation intentions entail specifying when, where, and how goal striving will occur, and detailing “if-then” plans for initiating and continuing goal striving (Gollwitzer, 1993). For example, a female swimmer striving to attain the goal of improving her strength may plan the time, location, and details of her strength training sessions, as well as contingencies for when situations arise that may interfere with her training. The formation of these detailed plans, and the planning processes undertaken when forming them, is proposed to enhance the automaticity of goal striving. Specifically, during planning, the mental representations of situations in which goal striving opportunities exist become highly activated, making such situations easier to identify, attend to, and remember. Furthermore, the initiation of responses in these situations becomes more efficient as it no longer requires conscious consideration (Gollwitzer, 1999). The proposed benefits of implementation intentions for goal striving were evident in a recent meta-analysis by Gollwitzer and Sheeran (2006). The data, including more than 8,000 participants across 94 independent studies, revealed a positive, medium to large effect of implementation intentions upon goal attainment ( $d = .65$ ). Furthermore, the findings supported the role of such intentions for both initiating and continuing goal striving.

Considering the evidence in favor of both autonomous goal motives and implementation intentions, Koestner, Lekes, Power, and Chicoine (2002) suggested that these previously independent factors may interact producing a synergistic effect upon goal attainment. Based upon Kuhl and Fuhrmann's (1998) dual component model of volition, which highlights the need for both self-maintenance (continuing awareness of the self) and goal-maintenance (continuing awareness of the goal) to ensure effective goal striving, Koestner et al. (2002) proposed that the furnishing of relatively autonomous goal striving with implementation intentions should result in the greatest goal attainment. In two studies assessing the attainment of weekend goals and New Year's resolutions, the authors found support for the proposed interaction. The pursuit of relatively autonomous goals and the formation of implementation intentions act upon independent aspects of goal striving. Specifically, relatively autonomous goal motives regulate the volitional forces prompting striving while implementation intentions provide cognitive strategies to support the pursuit of personal goals. Consistent with Kuhl and Fuhrmann's model, Koestner et al. (2002) proposed that the combination of these independent aspects of goal striving enhances the benefits of either factor alone.

It is important to note that Koestner et al. (2002), similar to Sheldon and Elliot (1999), used a relative autonomy index to examine goal motives. Consequently, the independent interactions of autonomous and controlled goal motives with implementation intentions cannot be gleaned from their results. Nevertheless, Koestner et al.'s (2002) data suggest not only greater attainment for those with relatively more autonomous motives, but also lower attainment for those whose motives are relatively more controlled. For these individuals, the forming of implementation intentions may counteract their intended benefits by amplifying the pressures underlying controlling motives, resulting in lower goal attainment and psychological well-being.

### **Implementation Intention Motives**

One mechanism through which the interactions of goal motives with implementation intentions may act is through the motives underlying the intentions themselves. These motives reflect the reasons underlying the formation of the implementation intentions, and can also be classified as either autonomous or controlled. For example, the swimmer in the previous example striving to improve her strength levels may plan the time, location, and details of her training sessions due to the perceived value of doing so. Alternatively, the swimmer may

feel obliged to plan such details due to external pressure perceived through comments from her coach. In a later study, Koestner, Horberg, Gaudreau, Powers, Di Pio, Bryan, et al. (2006) addressed the effects of these motives and identified that the relative autonomy of implementation intention motives was positively related to goal progress. Koestner et al. (2006) did not, however, examine the role of such motives in the goal striving process. We believe that implementation intention motives may act as mediators of the paths from goal motives to goal attainment. Through these intention motives an athlete's goal motives may additionally determine the influence of implementation intentions upon attainment by altering the volitional strength underlying the intentions.

The interaction of goal motives with implementation intentions, and the role played by the motives underlying these intentions have, thus far, only been considered in relation to personal academic and social goals (e.g., Koestner et al., 2006) and not in relation to sport-specific personal goals. Given the evidence for the implications of goal motives for both goal attainment and psychological well-being (Smith et al., 2007, 2009) and the apparent common use of implementation intentions during goal striving (Gollwitzer & Brandstätter, 1997), we believe that the examination of their interplay in sport is warranted.

### **The Present Study**

In summary, the present study aimed to contribute to the applied sport psychology research in three major ways. First, it aimed to further examine the role of goal motives in sport and specifically address some of their antecedents and consequences using a prospective design. Second, the study aimed to investigate the interactions (or lack thereof) between autonomous and controlled goal motives and implementation intentions in predicting goal progress and relative well-being. Finally, for those athletes who set implementation intentions, the study aimed to examine whether the motives underlying implementation intentions might be important in understanding how goal motives predict progress and well-being.

Consistent with Smith et al. (2007), coach autonomy support at the start of the season was hypothesized to be positively associated with autonomous goal motives at the same time point. In the present study, controlling coach behaviors were also measured and were expected to be positively linked to controlled goal motives. In terms of the consequences of goal motives, autonomous and controlled goal motives were hypothesized to positively and negatively predict goal progress at the mid-point of the season, respectively. In turn, goal progress was expected to be positively related to concurrent relative psychological well-being.

Concerning the second aim of the study, we anticipated that autonomous goal motives would interact with implementation intentions to positively predict goal progress and well-being at the mid-point of the season. Specifically, consistent with Koestner et al. (2002), goal progress and well-being were expected to be greatest when autonomous motives were combined with the existence of implementation intentions. An interaction was also hypothesized between controlled goal motives and implementation intentions with high controlled motives in the presence of implementation intentions expected to predict low goal progress and well-being. Notably, participants were asked to report their personal implementation intentions. We felt that such intentions would provide a personally relevant assessment of plan use that would reflect the idiographic approach to goal striving research advocated by Sheldon (2002).

Regarding the third aim of the study, the analyses were conducted with those who reported the use of implementation intentions to examine the role of the motives underlying such intentions. Based upon the proposed influence of the internalization of implementation intention motives (see Koestner et al., 2006), we anticipated that intention motives would play a mediatory role in linking goal motives to goal progress and well-being. Specifically, autonomous

and controlled intention motives were hypothesized to mediate the paths from autonomous and controlled goal motives to progress and well-being, respectively.

Finally, all of the associations predicted above were expected to remain significant when controlling for goal difficulty. Previous goal motives research revealed that the links from such motives to attainment remained unchanged when controlling for goal difficulty (Smith et al., 2007). Further, in the implementation intention literature, implementation intentions have been found to be more strongly linked to goal progress, and subsequent psychological well-being, for individuals striving for difficult goals. Thus, in the present study, further analyses were conducted to examine whether the findings were different when including only participants reporting high levels of goal difficulty.

## METHOD

### Participants

One hundred and eighty-nine (87 male, 95 female, 7 unspecified) regularly training British athletes volunteered to participate in the study and completed measures at the start of the sport season (Time 1). Athletes sustaining injuries that resulted in an absence from training of 1 month or greater ( $n = 5$ ) were excluded from analyses. Further, 81 participants from the original sample were unavailable at the second time point at the middle of their season (Time 2). In total, 108 (63 male, 45 female) completed the Time 2 measures, reflecting a 57% retention rate. It is important to note that this sample size is not dissimilar to those reported by Sheldon and colleagues (e.g.,  $N = 82$  to 141 in Sheldon & Elliot, 1998). Notably, in the present study Time 2 data collection was undertaken at the middle of a busy university semester in which coursework assessments placed high time demands on a number of the participants. The additional time demands placed upon a number of the participants during the Time 2 data collection may explain why some participants did not complete the follow-up questionnaire despite the reminders sent to them. No significant differences were found between those completing both time points and those who did not complete the Time 2 measures for Time 1 measures of coach behaviors (Wilk's  $\lambda = .97$ ,  $F(1,176) = 3.03$ ,  $p > .05$ ), goal motives (Wilk's  $\lambda = .99$ ,  $F(1,187) = .57$ ,  $p > .05$ ), or implementation intention motives (Wilk's  $\lambda = .97$ ,  $F(1,101) = 1.46$ ,  $p > .05$ ).

Participants completing both time points ranged from 18 to 67 years of age ( $M = 23.97$ ,  $SD = 9.77$ ) and were from a variety of individual (i.e., badminton, triathlon, track athletics) and team sports (i.e., rowing, cricket, netball, basketball, soccer, field hockey). Sports with the highest participation within the sample included track athletics (26.9%), field hockey (16.7%), and badminton (11%). Within their sports, participants ranged in competitive level from those participating in local (17.6%) and regional (15.7%) competitions to national (19.4%) and international-level (6.5%) events, with the majority competing at university-level competitions (39.8%).

### Goal-Related Measures

In line with the idiographic goal methodology (Sheldon & Elliot, 1999), and consistent with the methodology of Smith et al. (2007), participants were asked to self-generate a salient personal sports goal for which they would be striving during the entire sports season. Examples of participants' self-generated goals included "to improve my National ranking [in badminton]" and "to maintain my place in the first team."

### ***Goal Motives and Goal Difficulty***

Personal goal motives were examined using the idiographic goal methodology advocated by Sheldon and Elliot (1999). Specifically, participants rated the extent to which they were pursuing their goals in terms of four reasons reflecting intrinsic (e.g., “because of the fun or enjoyment the goal provides you”), identified (e.g., “because you personally believe it’s an important goal to have”), introjected (e.g., “because you would feel ashamed, guilty, or anxious if you didn’t”), and external (e.g., “because someone else wants you to”) regulations. For each participant, intrinsic and identified scores, and introjected and external scores, were aggregated to form autonomous and controlled goal motive scores, respectively. Smith et al. (2007) reported satisfactory reliability for both autonomous goal motives (Intraclass correlation coefficient, ICC [2] = .87) and controlled goal motives (ICC [2] = .95). Perceived goal difficulty was measured using three items developed for the present study and which expanded upon the single-item measure developed by Sheldon and Kasser (1998), which has been used in previous related research (Smith et al., 2007).

### ***Implementation Intentions***

The present study also examined participants’ personal use of implementation intentions. Consistent with Gollwitzer (1999), implementation intentions were described to the participants as planning the when, where, and how of goal striving, in addition to “if-then” plans for goal-related behaviors. Similar to previous implementation intention research (e.g., Koestner et al., 2002), we assessed the use versus non-use of intentions by the participants. Specifically, participants in the present study were asked to report whether they had formed such intentions for their goal using a yes/no response. In the same set of instructions, participants were given mixed information including arguments for (i.e., “some people have said that goal plans help them to organize how they will achieve their goals”) and against (i.e., “but others have said goals plans are not needed when they are clear about their goals”) forming implementation intentions to prevent bias towards a “yes” or “no” response. Furthermore, participants answering “yes” were asked to report the intentions they had formed, and participants answering “no” were asked to provide reasons for not forming such intentions. These open-ended responses were included to prevent response bias in favor of implementation intentions and to provide further information regarding participants’ intentions. To measure the motives underlying implementation intentions, those participants reporting implementation intention use additionally completed four items assessing the extent to which their implementation intentions were formed for autonomous or controlled reasons. Consistent with the approach adopted by Koestner et al. (2006), these four items were adaptations of those used in the goal motives measure. In the follow-up questionnaire, administered at Time 2, participants’ perceived goal progress was measured with four items adapted from goal attainment items used in previous research (Smith et al., 2007). These items were adapted to reflect progress at the mid-point of the season relative to the desired endpoint attainment. Prior to completing these four items, participants were given a written reminder of the personal goal they listed at Time 1 using participants’ own wordings. All goal-related variables were assessed using a response format ranging from 1 (*not at all*) to 7 (*very much so*).

### ***Perceptions of Coach Behaviors***

Participants’ perceptions of coach autonomy support were assessed using seven items taken from Smith et al. (2007). These items were primarily adaptations of items from the Health-Care Climate Questionnaire (HCCQ; Williams, Grow, Freedman, Ryan, & Deci, 1996). Smith et al. (2007) found evidence for the validity and reliability ( $\alpha = .93$ ) of the adapted seven-item version of the scale. Perceptions of coaches’ controlling behaviors were assessed using

**Table 1**  
**Six-item Measure Developed to Assess Athletes' Perceptions of Their Coaches' Controlling Behaviors**

Item	<i>M</i>	<i>SD</i>
My coach gives punishments for not performing up to his/her expectations.	3.05	1.74
The extent to which my coach accepts me is dependent upon my performance in my sport.	3.45	1.68
My coach makes comparisons between myself and others in my sport based upon my ability and performance.	3.46	1.78
My coach withholds rewards (e.g., praises/awards) if I do not perform well in my sport.	2.98	1.52
My coach makes it obvious that he/she is in charge during training.	4.53	1.39
My coach is overly critical of me when I have not performed well in my sport.	2.84	1.43

a scale developed by the present authors (see Table 1). This six-item scale incorporated the characteristics of controlling coach behaviors proposed by Mageau and Vallerand (2003). The scale included the use of controlling statements and conditional regard, the provision of punishments and rewards without competence information, the demonstration of overt physical control, and the prompting of ego-involving motives. A confirmatory factor analysis (CFA), conducted to test the one-factor structure of the newly developed controlling behavior scale, demonstrated reasonably satisfactory fit indices: scaled  $\chi^2(9) = 17.76$ ,  $p < .04$ , CFI = .95, RMSEA = .10 (90% CI = .02–.17), SRMR = .07, with all items loading moderately or strongly (median loading = .67) on the single factor. A response format ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) was used for all coach behavior items.

### ***Psychological Well-Being***

Psychological well-being at the mid-point of the season was measured using the 20-item Positive and Negative Affect Schedule (Watson, Tellegen, & Clark, 1988), the five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), and the five-item emotional/physical exhaustion subscale of the Athlete Burnout Measure (Raedeke & Smith, 2001). Participants were asked to rate each item in relation to the 2 weeks prior to questionnaire completion to obtain a measure that was neither too trait-like nor too state-like. In line with Smith et al. (2007), a relative well-being score was created for each participant by subtracting summed total scores of negative affect and emotional/physical exhaustion (ill-being indicators) from summed positive affect and life satisfaction total scores (well-being indicators). Positive and negative affect and life satisfaction have been examined as indicators of well-being within previous goal-striving research (e.g., Sheldon & Elliot, 1999). Consistent with Smith et al. (2007), the sport-specific items from the Athlete Burnout Measure were also included in the present study to provide a contextual indicator of ill-being.

### **Procedures**

The study received ethical approval from a university ethics committee and was conducted in accordance with the American Psychological Association ethical principles. Participants were recruited through telephone contacts with club coaches and sports club administrators, followed by in-person contacts at training sessions. Informed consent was received from all participants and their coaches prior to their participation in the study.



At the start of the sports season, the participants completed an initial multi-section questionnaire in which they nominated a salient personal sports goal that they would be pursuing during the entire season and reported whether they had formed implementation intentions in relation to that goal. Coach behaviors, goal motives, intention motives, and goal difficulty were also measured in this first questionnaire. Initial questionnaires were completed in-person at the participants' regular training sessions. The initial questionnaire took approximately 20 mins to complete. Eight weeks later, at approximately the mid-point of the season for each sport, participants completed personalized online questionnaires in which they reported their perceived goal progress and completed measures of psychological well-being. Although variations exist in season length between sports, it was decided that 8 weeks following the start of the season was sufficiently distanced from the start and end of the season for each sport included and, thus, provided a suitable midseason time point.

An online follow-up questionnaire was used to maximize participant response rate. Online questionnaires avoid the attrition resulting from participants' absence from training sessions at which paper questionnaires are administered. Furthermore, Lonsdale, Hodge, and Rose (2006) have reported the benefits of online surveys for increasing the speed of participant responses and minimizing missing data. Prior to use, the online questionnaire was pilot tested with a number of PhD students in sport psychology to assess usability. Pilot testing indicated that the online questionnaire was user-friendly and took approximately 15 mins to complete. To enable the paper (Time 1) and online (Time 2) questionnaires to be matched while preserving anonymity, participants were asked to indicate their date of birth, gender, and initials on each questionnaire.

## RESULTS

### Descriptive Statistics and Scale Reliabilities

Table 2 presents the descriptive statistics, reliability coefficients, and bivariate correlations for all variables. The internal reliability coefficients of the autonomous and controlled personal goal motive and implementation intention motive measures were not assessed in the present study because each motive scale was comprised of just two motives (e.g., intrinsic and identified regulations for autonomous goal motives). The reliabilities of all other scales were calculated using Cronbach alpha coefficients. All scales demonstrated satisfactory reliability ( $\alpha = .82$  to  $.92$ ). Consistent with previous research (Smith et al., 2007), participants rated their personal goal motives as more autonomous than controlled. For those participants who had formed implementation intentions, these intentions were also rated as being set for more autonomous than controlled reasons. In total, 57% ( $n = 62$ ) of the sample formed intentions.

Similar to previous findings (e.g., Smith et al., 2009), and once again supporting their treatment as independent goal factors, autonomous and controlled goal motives were unrelated ( $r = .08$ ). Autonomous and controlled implementation intention motives were also uncorrelated ( $r = .00$ ), but were strongly, and significantly, related to autonomous ( $r = .79$ ) and controlled ( $r = .80$ ) goal motives, respectively. In contrast to our predictions, self-reported goal progress was not associated with autonomous or controlled goal motives, or with concurrent relative well-being. Similarly, the motives underlying participants' implementation intentions were unrelated to goal progress.

### Testing the Hypothesized Goal Striving Model

To examine the fit of the present data to the hypothesized model, structural equation modeling (SEM) analysis was conducted using EQS, version 6.1 (Bentler, 2003). In this analysis the entire sample was included irrespective of whether they had formed implementation intentions

**Table 2**  
**Descriptive Statistics, Internal Reliabilities, and Bivariate Correlations Among Study Variables**

	<i>M</i>	<i>SD</i>	$\alpha$	1	2	3	4	5	6	7	8
1. Coach autonomy-supportive behaviors	5.03	1.06	.91								
2. Coach controlling behaviors	3.38	1.16	.82	-.08							
3. Autonomous goal motives <sup>a</sup>	11.42	1.97	—	.35**	-.13						
4. Controlled goal motives <sup>a</sup>	4.77	2.36	—	-.02	.20	.08					
5. Autonomous intention motives <sup>ab</sup>	11.37	1.79	—	.37**	-.06	.79**	.00				
6. Controlled intention motives <sup>ab</sup>	4.92	2.66	—	.01	.36**	-.04	.80**	.00			
7. Goal difficulty	4.93	1.32	.92	.01	.13	.02	-.04	.21	.11		
8. Goal Progress	4.46	1.45	.96	.08	-.07	-.02	.01	-.02	.04	-.06	
9. Relative psychological well-being	3.89	2.52	.90	.20*	-.19	.31**	-.28**	.25*	-.48**	-.21	-.02

<sup>a</sup>Reliability coefficients could not be calculated due to the measure comprising only two items. <sup>b</sup>Statistics are given only for those who set implementation intentions.

\* $p < .05$ , \*\* $p < .01$ .

or not. In consideration of the sample size ( $N = 108$ ), an observed factor model was tested to ensure a satisfactory ratio of participants per parameter (Bentler & Chou, 1987). The six-factor hypothesized model was tested using robust maximum likelihood estimation (Mardia's normalized estimate of multivariate kurtosis = 2.40). A number of indices provided by EQS were examined including the Satorra-Bentler scaled  $\chi^2$  (because the data were not normally distributed), the Comparative Fit Index (CFI), the Bentler-Bonnet Non-Normed Fit Index (NNFI), the Root Mean Square Error of Approximation (RMSEA), with its 90% confidence interval (CI), and the Standardized Root Mean Square Residual (SRMR). Examination of these fit indices allows an assessment of model fit while controlling for modest non-normality in the sample. The fit indices indicated poor fit of the hypothesized model: scaled  $\chi^2(10) = 24.53$ ,  $p < .01$ , CFI = .42, NNFI = .13, RMSEA = .12 (90% CI = .06–.19), SRMR = .11. Consistent with the bivariate correlations, the standardized solutions revealed non-significant paths from autonomous and controlled goal motives to goal progress ( $\beta = .00$ ,  $\beta = -.02$ , respectively), and from goal progress to relative psychological well-being ( $\beta = -.03$ ). Therefore, a second model was tested in which the goal progress variable was removed. The fit indices indicated substantially improved fit of the revised model to the data: scaled  $\chi^2(6) = 6.30$ ,  $p > .05$ , CFI = .99, NNFI = .98, RMSEA = .02 (90% CI = .00–.14), SRMR = .07. All specified paths in the revised model were significant (see Figure 1a).

### Assessing the Interactions of Goal Motives with Implementation Intentions

The interactions between autonomous or controlled goal motives and implementation intentions were tested using hierarchical multiple regression analyses. As a result of the non-significant associations of goal progress with goal motives, relative well-being was used as the sole criterion variable. Separate hierarchical multiple regressions were conducted for autonomous and controlled goal motives. In each regression, goal motives and implementation

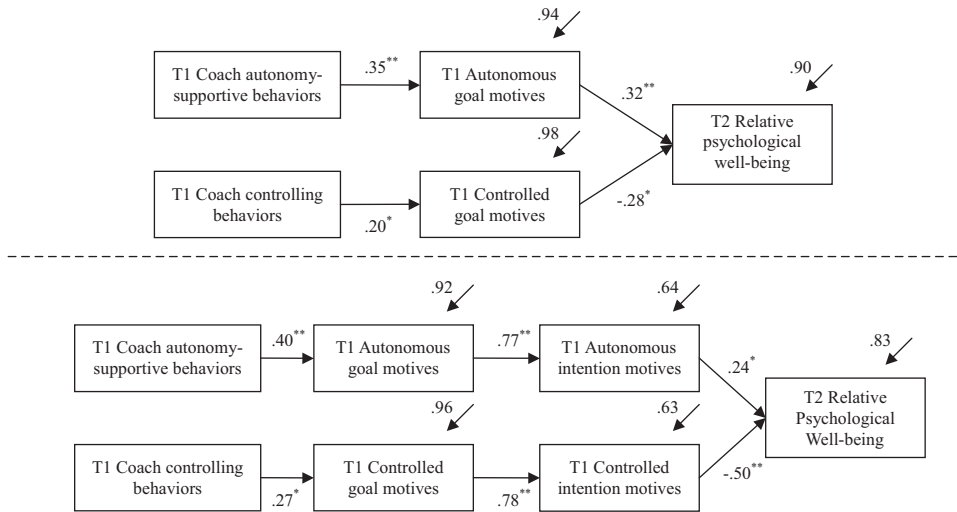


Figure 1. The revised (top part; Figure 1a) and extended models (bottom part; Figure 1b) showing the relationships between coach behaviors, personal goal motives, implementation intention motives, and relative psychological well-being. T1 and T2 refer to start of season and midseason measures, respectively. All paths were significant, as indicated. \* $p < .05$ , \*\* $p < .01$ .

intentions (0 = no implementation intentions, 1 = implementation intentions reported) were entered first as independent predictors of relative well-being. The product term of autonomous or controlled goal motives and implementation intentions was entered in the second step. Both autonomous and controlled goal motives were centered prior to formation of the product term to prevent multicollinearity (Aiken & West, 1991). A significant main effect was found for autonomous goal motives ( $\beta = .36, p < .01$ ), but not for implementation intentions ( $\beta = -.01, p > .05, R^2 = .08, p < .01$ ). The product term for autonomous motives and implementation intentions was not significant ( $\beta = -.07, p > .05$ ) and did not contribute to the variance explained ( $\Delta R^2(1,104) = .00, p > .05$ ). In the second regression, neither controlled goal motives ( $\beta = -.02, p > .05$ ) nor implementation intentions ( $\beta = .02, p > .05$ ) emerged as significant predictors of relative well-being ( $R^2 = .06, p < .05$ ), however their interaction was significant ( $\beta = -.33, p < .05$ ), and contributed to the variance explained ( $\Delta R^2(1,104) = .09, p < .05$ ).

To determine the form of the interaction between controlled goal motives and intentions, two regression lines were plotted to represent the regression of relative well-being on controlled motives for participants who did and did not report implementation intentions (see Figure 2). Simple slope analyses revealed that controlled motives significantly and negatively predicted relative well-being for participants who had formed implementation intentions for their personal goal ( $b = -.46, t[106] = -3.70, p < .01$ ), but was not a significant predictor for participants who had not formed such intentions ( $b = -.02, t[106] = -.10, p > .05$ ).

### Examining the Role of Implementation Intention Motives

To test the hypothesized mediatory function of the motives underlying implementation intentions, an extended version of the revised model in Figure 1a was tested in which only participants reporting implementation intentions ( $n = 62$ ) were included. In this model, paths were specified from coach behaviors to respective goal motives, from autonomous and controlled

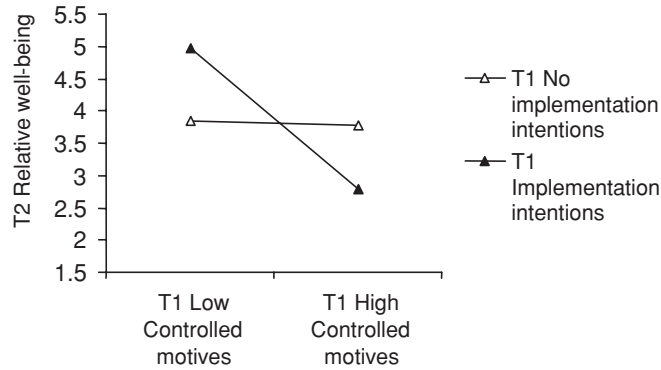


Figure 2. Interaction between controlled goal motives and implementation intentions in the prediction of relative psychological well-being. T1 and T2 refer to start of season and midseason measures, respectively. No implementation intentions set:  $b = -.46$ ,  $t(106) = -.37$ ,  $p < .01$ . Implementation intentions set:  $b = -.02$ ,  $t(106) = -.10$ ,  $p > .05$ .

goal motives to autonomous and controlled implementation intention motives, respectively, and from autonomous and controlled intention motives to relative well-being. The maximum likelihood method (Mardia's normalized estimate of multivariate kurtosis = .52) was used. The fit indices indicated good fit of the model to the data: scaled  $\chi^2(15) = 12.43$ ,  $p > .05$ , CFI = 1, NNFI = 1, RMSEA = .00 (90% CI = .00, .11), SRMR = .08 (see Figure 1b). The mediation of the paths from goal motives to relative well-being via implementation intention motives was tested using Holmbeck's (1997) approach, which assesses Baron and Kenny's (1986) four steps for mediation in three structural models. First, the mediation of the link from autonomous goal motives to relative well-being was tested using an initial model with a direct path ( $\beta = .16$ ) between these variables (step 1). Step 2 (autonomous goal motives to autonomous intention motives) and step 3 (autonomous intention motives to relative well-being) were tested in Figure 1b. In a final model, the direct path from autonomous goal motives to well-being was freed in addition to the mediation paths. With the addition of autonomous intention motives, the direct path from autonomous goal motives to relative well-being dropped from  $\beta = .16$  ( $p < .05$ ) to  $\beta = -.06$  and became non-significant. The mediation of the path from controlled goal motives to relative well-being, via controlled implementation intention motives, was tested using an identical procedure. With the addition of controlled intention motives, the direct path from controlled goal motives to well-being dropped from  $\beta = -.43$  ( $p < .01$ ) to  $\beta = -.10$  and became non-significant, supporting the mediatory role of intention motives.

### Controlling for Goal Difficulty

To examine whether our findings were independent of goal difficulty, this variable was included as an additional predictor in each of the analyses. Although a main effect of goal difficulty upon well-being was identified in the model tested in Figure 1a, the associations among the variables in the model remained largely unchanged. Furthermore, the interactions between autonomous and controlled goal motives with implementation intentions remained largely unchanged. To examine whether implementation intentions were more relevant to those participants reporting high goal difficulty, the interaction analyses were repeated only with participants ( $n = 54$ ) with goal difficulty scores above the sample median (5.17). In these

analyses the results remained largely unchanged from those of the entire sample indicating that the findings in the main analyses were not dependent upon levels of goal difficulty.

## DISCUSSION

The present study comprised three purposes addressing the volitional components underlying goal striving in sport. First, the study assessed the role of coach behaviors as predictors of athletes' goal motives at the start of the season, as well as the consequences of such motives for mid-season goal progress and psychological well-being. Second, the study examined the interactions between autonomous and controlled goal motives and athletes' personal implementation intentions. Finally, the study addressed the role of motives underlying implementation intentions themselves in the goal striving process.

### Predictors and Outcomes of Athletes' Goal Motives

Consistent with expectations, athletes' perceptions of their coaches' autonomy-supportive behaviors, such as the provision of choice during training sessions (e.g., a coach allowing an athlete to choose on which areas of improvement to focus during a training session), were positively related to autonomous goal motives. This finding, which emphasizes the positive role of the coach in the goal-striving process, is consistent with previous research on goal motives (Smith et al., 2007) and with previous self-determination research linking such behaviors with autonomous contextual motivation (e.g., Gagné, Ryan, & Bargmann, 2003).

Developing upon previous research, the current study additionally revealed a positive link from controlling coach behaviors, such as the use of controlling statements and the enforcement of punishments, to controlled goal motives. Such behaviors not only appear to be unrelated to an athlete's autonomy, they also cultivate the internal and external pressures perceived by the athlete in relation to their personal goals. The direct paths from controlled goal motives to relative well-being found in previous studies (e.g., Smith et al., 2007), as well as in the present study, highlight the need for coaches to avoid the use of controlling behaviors (e.g., punishments for performing below the coach's expectations). It is interesting to note that autonomy-supportive and controlling coach behaviors positively predicted the related autonomous and controlled goal motives, respectively, but were not strongly correlated with the opposing goal motives. Further examination is undoubtedly required to develop our understanding of these motivational processes. Nevertheless, the present data suggest that to foster goal motives based on intrinsic interest and perceived utility and ensure the absence of motives due to perceived internal and external pressures, coaches should both use autonomy-supportive behaviors and avoid the use of controlling behaviors.

The positive and negative associations identified between beginning of season autonomous and controlled goal motives and mid-season relative well-being, respectively, emphasize once again the affective benefits of striving for goals prompted by personal interests and underlying values, and not by the need to satisfy internal or external demands. Notably, mid-season goal progress was not predicted by either motive in the present study. When comparing the latter finding to results from previous goal-striving research, one explanation for the discrepant findings may relate to the use of a progress as opposed to a goal attainment measure. Previous research focusing upon sport-specific goal striving (e.g., Smith et al., 2007) and context-free goal striving (e.g., Sheldon & Elliot, 1999) has usually assessed goal attainment as a measure of endpoint success. Even when measured during goal striving, the phrasing of items has reflected attainment up to the point of the measure. In the current study, athletes were asked to rate their perceived relative progress towards their goal at the mid-point of the season instead

of goal attainment up to that point. Although both measures have the same reference point, the measure of relative progress also requires judgments of future goal striving (i.e., for the remainder of the season). Consequently, self-reports of goal progress may not accurately reflect actual progress at that point. For example, the persistence of effort underlying autonomous goal striving may result in an underestimation of current progress relative to anticipated end attainment. Such underestimations may also be prompted by the higher personal standards held by autonomously motivated athletes (Miquelon, Vallerand, Grouzet, & Cardinal, 2005).

Supporting the suggestion that mid-season self-reported goal progress may not have accurately reflected actual progress in this study, the progress scores were also not associated with mid-season relative well-being. This finding is inconsistent with previous research (e.g., Sheldon & Elliot, 1999) and with the positive affective consequences proposed to result from minimizing discrepancies between current and ideal goal states (Carver & Scheier, 1990). The need to remove goal progress from the analyses raises questions regarding individual differences in the conceptualizations of goal progress. Addressing measurement issues regarding goal progress and how it differs from goal attainment may help to provide further understanding of the mechanisms underlying the links from goal motives to goal progress and attainment.

### **The Implications of Forming Implementation Intentions**

Addressing the second aim of the study, further analyses were conducted assessing the separate interactions of implementation intentions with autonomous and controlled goal motives. In two previous studies, Koestner et al. (2002) identified an interaction between relatively autonomous goal motives and implementation intentions, such that the combination of these volitional components resulted in greater goal attainment and subsequent psychological well-being, than either component alone. When predicting relative well-being in the present study, the interaction between autonomous goal motives and implementation intentions was not found to be significant. In contrast, forming implementation intentions was found to moderate the association of controlled goal motives with relative well-being, so that the combination of the two resulted in the lowest relative well-being. Both analyses remained unchanged when examining only those goals that were perceived to be above the median in perceived difficulty.

Our findings suggest that implementation intentions do not provide additional affective benefit to athletes pursuing goals autonomously. This lack of affective benefit is perhaps understandable when considering that such intentions have been found to be primarily beneficial for behavioral goal responses. In addition, the non-significant interaction between autonomous goal motives and implementations intentions may indicate that such intentions may not be required when motives underlying goal striving are autonomous. When pursuing goals autonomously, implementation intentions may not be required because the volitional strength gained by striving for goals that align with personal interests and values may protect goal striving through to completion. Notably, Sheldon and Elliot (1999) also found the paths from relatively autonomous goal motives to goal-directed effort and subsequent goal attainment to remain unchanged when controlling for implementation intentions. Furthermore, based upon evidence of the advantages of autonomous contextual motivation for preserving self-regulatory strength (Moller, Deci, & Ryan, 2006), it is possible that the proposed benefits of implementation intentions for ensuring goal striving when such self-regulatory reserves are depleted (Achtziger, Gollwitzer, & Sheeran, 2008) may not be necessary when goals have autonomous motives. Although further research is needed, the present data suggest that furnishing autonomous goal motives with implementation intentions may not result in affective or behavioral gains.

In contrast, the interaction between controlled motives and implementation intentions indicates a potential risk in terms of levels of relative well-being. Specifically, the data revealed that for athletes forming implementation intentions, controlled goal motives were significantly and negatively associated with relative well-being at the season mid-point. It seems that when goal striving is prompted by the perception of internal or external pressures, the addition of facilitative cognitive strategies may amplify the affective consequences of these demands. For coaches and athletes this finding identifies not only the potential risks to well-being resulting from goal striving prompted by guilt, shame, or external coercion, but the amplifying effect of trying to facilitate such goals with detailed plans for goal pursuit. It is not possible to ascertain whether such an interaction was also present in Koestner et al.'s (2002) original data because the authors used a relative autonomy index to measure goal motives.

The interaction of controlled goal motives with implementation intentions echoes previous evidence of the aggravating function of implementation intentions for socially prescribed perfectionists (Powers, Koestner, & Topciu, 2005) and individuals experiencing occupational stress (Budden & Sagarin, 2007). Similarly, intense monitoring of goal striving undertaken when following implementation intentions may exacerbate negative affective reactions of athletes motivated by controlled reasons due to perceived expectations/pressures from themselves or others. Furthermore, as Budden and Sagarin proposed, implementation intentions may restrict alternative routes to goal attainment, which may prove distressing for athletes with controlled motives who are already not optimistic regarding their goal progress (Ratelle, Vallerand, Chantal, & Provencher, 2004). For example, athletes driven to attain specific competitive goals to satisfy their coaches' demands may experience greater pressure when their chances for attaining that goal are restricted to only those opportunities detailed in their implementation intentions.

### **Mediation via Implementation Intention Motives**

Findings from separate analyses, conducted to address the third purpose of the study, may provide further understanding of the mechanism explaining the negative implications of combining controlled goal motives with implementation intentions. These analyses indicated a mediatory role played by the motives underlying the implementation intentions themselves. Specifically, controlled implementation intention motives mediated the path from controlled goal motives to relative well-being. In contrast, autonomous intention motives mediated the path from autonomous goal motives to psychological well-being. These additional findings suggest that implementation intentions may prove detrimental for athletes whose goals are undergirded by controlled motives, perhaps because such motives often result in the formation of controlled implementation plans, thus exerting additional pressures. Furthermore, although implementation intentions may not enhance autonomous goal striving, the mediation found suggests that for those forming such intentions, the pursuit of interesting and personally relevant personal goals enables the internalization and autonomous formation of their implementation plans.

### **Implications and Future Directions**

The present study supports the self-concordance model (Sheldon & Elliot, 1999) as a framework for assessing the volitional components underlying goal striving in sport. Our findings highlight the need to study autonomous and controlled goal motives as separate predictors. Although the creation of relative autonomy scores for goal-related and intention motives may simplify examinations of goal striving, the present study suggests that doing so may obscure findings that are relevant for both basic research and applied practice.

From an applied standpoint, the findings underscore the important role played by the coach in the goal-striving process. Such a contribution has implications not only for the behavioral aspects of goal pursuit, but also, as demonstrated in this and previous studies (e.g., Smith et al., 2007), for the affective consequences of goal striving. An applied implication from this line of research is that coaches should use behaviors that support their athletes' autonomy in relation to their personal goals. For example, such behaviors can be demonstrated by providing a sense of choice and adopting their athletes' perspectives, while also avoiding behaviors, such as the use of controlling language, which may exert external, or encourage internal, pressures. In relation to the application of implementation intentions, the findings suggest a need to be cautious when forming such intentions, particularly when goal striving is prompted by introjected or external motives. It is understandable that athletes, and others in their support teams, may wish to ensure goal achievement through detailed planning and the identification of means that enhance goal progress. Nevertheless, for athletes whose goals are regulated by guilt, shame, pride, or by the influence of an external factor (e.g., a parent), such planning may provide a greater detriment to well-being than such motives alone. In turn, it is important for coaches and sport psychologists to be aware of their athletes' motives prior to teaching them the use of implementation intentions.

The correlational design of the present study was adopted to allow analysis of participants' own natural use of implementation intentions in their sports; however, future research using experimental protocols is warranted to ascertain the direction of causality underlying the identified associations. Further research may also benefit from using coaches' reports of their own behaviors. One could argue that objective measures of goal progress could also be obtained. Nevertheless, self-report measures of goal progress, such as the one used in the present study, assess the functional significance of the goal-striving process to the athletes (Ryan & Deci, 2002).

In addition to developing upon methodological aspects, a number of conceptual future directions may be proffered to develop upon the findings of the present research. Although this study addressed the role of implementations as a cognitive strategy for aiding goal attainment, the role of such intentions as a coping strategy for dealing with difficulties during goal striving, as well as when personal goals become unattainable, also warrants future investigation. In this instance, implementation intentions may not only influence athletes' goal strivings but also their abilities to effectively cope with difficulties and their adaptive disengagement from goals that are no longer attainable (Wrosch, Scheier, Miller, Schulz, & Carver, 2003). Additionally, reflecting the proposed non-conscious aspects of implementation intentions (Gollwitzer & Bargh, 2005), further research should consider the use of methods such as cognitive priming to examine the non-conscious formation of goal motives and implementation intention motives and the implications of such motives for goal striving and associated affective outcomes.

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