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Reciprocal relationships between contextual and situational motivation in a sport setting

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Abstract

Objective: The purpose of this investigation was to test the hypothesized reciprocal top-down (TD) and bottom-up (BU) relationships between motivation at one given level and motivation at the next adjacent level in Vallerand's [1997, Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 271–360). New York: Academic Press] Hierarchical Model of Intrinsic and Extrinsic Motivation. These postulates were examined in two studies, whereby the dynamic interplay between motivation toward a specific life domain (i.e., contextual) and the motivation experienced during a specific point in time (i.e., situational) was examined.

Method and Results: In Study 1, a sample of collegiate basketball players ($N = 162$) were followed during two games at a pre-season tournament. Reciprocal TD and BU effects between athletes' contextual motivation toward their sport and the situational motivation they experienced during their games were expected. The influence of situational factors such as perceptions of personal and team performance on situational motivation was also examined. Results from path analyses provided support for our hypotheses. Study 2 ($N = 150$) replicated the findings of Study 1 which followed athletes during an entire basketball season. Reciprocal TD and BU effects between athletes' contextual motivation toward their sport and the situational motivation they experienced during games of each half of the season were observed. Moreover, contextual motivation assessed at the end of the season predicted athletes' sustained interest in their sport. Results from Study 2, also provided support for the mediating role of psychological need satisfaction on the

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relationship between situational factors such as perceptions of personal and team performance on athletes' situational motivation experienced during games.

Conclusion: Implications for intrinsic/extrinsic motivation theory and research in the sports domain are discussed.

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Motivation as a psychological construct has been a core topic in the domain of sport and exercise. Research conducted over the last few decades has aimed to better understand the social and intra-individual factors thought to promote or hinder a person's motivation toward their physical activity thus resulting in a number of important affective, behavioral, and cognitive consequences. Self-Determination Theory (SDT) (Deci & Ryan, 1985b, 2002) and more recently the Hierarchical Model of Intrinsic and Extrinsic Motivation (Vallerand, 1997) are comprehensive models of human motivation and behavior regulation that have made important contributions to the advancement of knowledge in the field of sport and exercise. Grounded in these frameworks, several studies have examined the social and psychological determinants of athletes' motivation toward their sport in general (i.e., Brière, Vallerand, Blais, & Pelletier, 1995; Brunel, 1999; Ntoumanis, 2001; Pelletier, Fortier, Vallerand, & Briere, 2001; Pelletier et al., 1995; Petherick & Weigand, 2002). Collectively, results from these studies indicate that environmental factors thought to promote athletes' feelings of self-determination toward their sport lead to positive outcomes. A number of studies have also shown support for the mediating role of basic need satisfaction on the relationship between environmental factors and athletes' motivation toward their sport. Results from these studies indicate that environmental factors thought to support athletes' basic needs for autonomy, competence, and relatedness foster more internalized and self-determined forms of motivation which lead to more positive consequences (i.e., Hollebeak & Amorose, 2005; Ntoumanis, 2001; Sarrazin, Vallerand, Guillet, Pelletier, & Curry, 2002). These findings have also been corroborated in studies conducted at a more situational level (i.e., during practice or during a competition) where the determinants of athletes' state motivation were investigated (Conroy, Kaye, & Coatsworth, 2006; Gagné, Ryan, & Bargmann, 2003; Kowal & Fortier, 1999, 2000; Prusak, Treasure, Darst, & Pangrazi, 2004). However, little is known on the dynamic interplay between athletes' motivation toward their sport in general and the motivation they experience during specific situations. In a similar way, little is known about motivation acting as an intrapersonal variable, influencing proximal levels of motivation. While past research has provided insight as to the social and intrapersonal antecedents of motivation, the relationship between different levels of motivation has been less examined. Accordingly, the purpose of this research was to investigate how situational and contextual motivations affect one another in two longitudinal studies predicting an important consequence for athletes, namely interest toward their sport.

Self-Determination Theory

SDT (Deci & Ryan, 1985b, 2002) posits that human beings have a natural tendency toward the internalization and integration of their behavior and activities into a coherent sense of self (Ryan & Deci, 2000). However, the extent of this internalization and integration is contingent upon social

factors that either facilitate or impede this process. Environmental conditions that provide humans with the essential psychological nutrients necessary for vitality, growth, and optimal development, namely the need to feel autonomous, competent, and related to others are hypothesized to foster more autonomous or self-determined types of behavioral regulations. By contrast, social factors that thwart the satisfaction of these basic psychological needs promote less internalized, more controlled types of behavior regulation. In other words, when people's reasons for engaging in their activities emanate from their true authentic selves, their resulting behavior regulations are characterized by self-determination. By contrast, when people feel pressured to participate in an activity, they experience little self-determination or autonomy. Deci and Ryan (1985b, 2002), and Vallerand (1997) proposed that humans could embrace three different types of motivation namely intrinsic, extrinsic, and amotivation which are characterized by qualitatively different styles of behavior regulation. Intrinsically motivated behaviors are performed for their own sake, to experience pleasure and satisfaction inherent in the activity. On the other hand, extrinsically motivated behaviors are performed as a means to an end. The benefits of engaging in the activity are separate from the activity itself. However, Deci and Ryan (1985b, 2002) have proposed four distinct types of behavior regulation associated with extrinsic motivation, each with varying levels of perceived autonomy reflecting the degree to which the behavior has been internalized and integrated into the self. *External regulation* and *introjected regulation* are the least internalized types of behavior regulation, characterized by control and coercion. By contrast, *identified* and *integrated regulations* are associated with greater levels of perceived autonomy. Hence, behaviors are performed because they are deemed personally important and are coherent with a person's overarching values. Finally, amotivation is the hallmark of depression and feelings of incompetence akin to learned helplessness (Deci & Ryan, 2002). Individuals who are amotivated are neither intrinsically nor extrinsically motivated.

Given the implied level of perceived autonomy associated with self-determined styles of behavior regulation (i.e., intrinsic motivation, integrated regulation and identified regulation) positive outcomes ensue from engaging in activities out of personal choice and enjoyment. By contrast, negative outcomes are likely to result as a consequence of being forced or coerced to engage in an activity, typically associated with less self-determined styles of behavior regulation (i.e., amotivation, external regulation and introjected regulation). Results from studies conducted in a number of different life domains revealed that self-determined styles of behavior regulation are associated with greater levels of creativity (Sheldon, 1995), enhanced learning, interest, and enjoyment (Black & Deci, 2000), greater vitality (Nix, Ryan, Manly, & Deci, 1999), a healthy persistence (Pelletier et al., 2001), and a more stable self-esteem (Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000). Self-determined styles of behavior regulation have also been linked to indicators of both physical and psychological well-being. Conversely, non-self-determined styles of behavior regulation have been negatively associated with the aforementioned correlates of optimal human functioning but positively related to psychological poverty and dysfunctioning (see Deci & Ryan, 2002; Vallerand, 1997, for a review).

The Hierarchical Model of Intrinsic and Extrinsic Motivation

Vallerand (1997) has formally integrated the determinants and consequences associated with each of the three different types of motivation (intrinsic, extrinsic and amotivation) into a comprehensive hierarchical model of intrinsic and extrinsic motivation. The model provides a

useful “framework for organizing the basic mechanisms underlying intrinsic and extrinsic motivational processes” (p. 273). Vallerand (1997) has proposed numerous postulates and associated corollaries for the hierarchical model. However, only those pertaining to the different levels of generality as well as the hypothesized dynamic relationships between adjacent motivations in the hierarchy will be discussed.

First, motivation within a person exists in a hierarchy pertaining to three levels of generality. The first level occurs at a more global level, referring to a person’s general motivational orientation toward his or her environment. Motivation from this perspective is akin to a personality trait and studied as an individual difference variable. Measures such as the General Causality Orientation Scale (Deci & Ryan, 1985a) and more recently the General Motivation Scale (Pelletier, Blanchard, Sharp, Otis, & Amiot, 2004a) are designed to capture an individual’s relatively enduring manner of interacting with the environment. Given that the present study focuses on motivation at the next two levels of the hierarchy, we will not elaborate further on motivation at the global level.

The second level of generality pertains to motivation experienced at a contextual level or toward a specific life context such as work, education, leisure, relationships, and sports. Indeed, numerous studies have examined the impact of both social and psychological factors on athletes’ contextual motivation toward their sport (see Pelletier & Sarrazin, *in press*, for a review of the most commonly used measures of self-determination in the domain of sport and exercise). Specifically, the coach’s interpersonal style (Brière et al., 1995; Pelletier et al., 1995, 2001), a task versus ego-involvement orientation in achievement goals (Brunel, 1999; Ntoumanis, 2001, Petherick & Weigand, 2002), coping strategies (Amiot, Gaudreau, & Blanchard, 2004), and cognitive-behavioral psychological skills training (Beauchamp, Halliwell, Fournier, & Koestner, 1996) are thought to play a determining role on the degree of self-determination athletes experience toward their sport. Overall, results from these studies have consistently demonstrated that higher levels of self-determination were linked to greater behavioral persistence, more effective performance, and better psychological functioning in sport. Other studies have tested the hypothesized link between determinants (i.e., social factors), psychological mediators (i.e., perceptions of autonomy, competence and relatedness), and contextual motivation toward sport (Hollembeak & Amorose, 2005; Ntoumanis, 2001; Sarrazin et al., 2002). In line with the tenets proposed by SDT as well as the Hierarchical Model of Intrinsic and Extrinsic Motivation, results from these studies provide evidence for the mediating role of perceptions of basic need satisfaction. Collectively, research conducted at the contextual level is quite conclusive. Social factors and psychological mediators assessed at the contextual level represent reliable predictors of athletes’ motivation toward their sport in general.

The third level of generality pertains to motivation that individuals experience in the ‘here and now’, that is the motivation they experience in the present while performing a task. Unlike contextual motivation, studies that have examined the determinants and consequences associated with the different types of motivation people experience during a specific activity have been constrained to laboratory experiments. The paucity of research assessing situational motivation in the field may be attributed to: (1) the lack of applicability of the free-choice behavioral measure typically used in laboratory experiments to field settings and (2) the lack of self-report measures that capture the multi-dimensionality of situational motivation. The Situational Motivation Scale (SIMS; Guay, Vallerand, & Blanchard, 2000) was designed to address these previous methodological limitations.

Studies that have employed the SIMS in the sports domain provide support for the motivational sequence proposed by SDT and Vallerand's (1997) model of motivation. Situational factors such as providing people with a choice of physical activities (Prusak et al., 2004), perceptions of the motivational climate, focused either on task mastery or demonstrating one's ability to others (Conroy et al., 2006; Kowal & Fortier, 2000) and perceptions of success (Kowal & Fortier, 2000) as well as individual factors, namely goal orientations (Conroy et al., 2006; Standage & Treasure, 2002) emerged as significant predictors of situational self-determination assessed immediately after the activity. In turn, feelings of situational self-determination were positively associated with athletes' incoming well-being to practice (Gagné et al., 2003) and the psychological state of flow (Csikszentmihalyi, 1990; Kowal & Fortier, 1999). However, very few studies have examined the mediating processes by which situational factors impact athletes' situational motivation. Kowal and Fortier (2000) examined the mediating role of athletes' perceptions of basic psychological need satisfaction on the relationship between social factors which promote feelings of autonomy, competence and relatedness and athletes' situational motivation. They found that perceptions of success and mastery during practice positively predicted feelings of self-determination through perceptions of competence and relatedness. Interestingly, feelings of autonomy did not emerge as a significant mediator. The importance of basic psychological need satisfaction at the situational level is well demonstrated in a study by Gagné and colleagues. Using diary studies, they found that changes in well-being experienced during a gymnastics practice were attributed to the degree to which the gymnasts felt that their needs for autonomy, competence, and relatedness were met during practice. In sum, results from the studies reviewed herein are in line with those found at the contextual level of motivation; situational factors that support athletes' basic needs for autonomy, competence, and relatedness are positively associated with self-determined forms of situational motivation, ensuing positive consequences such as flow and subjective well-being.

In addition to the different levels of generality, the hierarchical model proposes the existence of a dynamic relationship between adjacent motivations in the hierarchy. In other words, motivation at one given level results from motivation at the next proximal level. Accordingly, a top-down (TD) effect is postulated, meaning that motivation at a higher level of generality (i.e. contextual motivation) affects motivation at the next lower level of generality (i.e., situational motivation). For instance, if an athlete is generally self-determined toward their sport, they will likely experience feelings of self-determination while engaging in specific activities relevant to their sport (i.e., during practice or a competition). In addition to this TD effect, Vallerand (1997) theorized that a bottom-up (BU) relationship also exists between adjacent levels of motivation. In the context of sport, it is expected that repeated experiences of self-determination during a specific situation, will impact athletes' motivation toward their sport in general. In other words, Vallerand (1997) suggests that increases or decreases in self-determination at the situational level can result in increases or decreases in self-determination at the contextual level. Finally, the proposed TD and BU relationships between motivations at proximal levels in the hierarchy are reciprocal; mutually influencing one another over time.

Together, SDT (Deci & Ryan, 1985b, 2002) and Vallerand's (1997) Hierarchical Model of Intrinsic and Extrinsic Motivation are useful frameworks for understanding motivation within the individual. The hypothesized links between variables in both approaches have been tested and empirically supported in various studies conducted in a number of different life contexts. The psychometric properties of the instruments used in these studies are also well documented. While

the impact of social factors on motivation at the respective level in the hierarchy has received abundant empirical support, the impact of motivation at one level in the hierarchy on motivation at the next proximal level in the hierarchy has received little empirical attention. Guay, Mageau and Vallerand (2003) provided support for the reciprocal TD and BU effects between global and contextual motivation in the domain of education. However the dynamic interplay between contextual motivation and situational motivation remains to be tested. The mutual influence of both of these motivations is particularly relevant in the sports domain. Given the saliency of the situation in sports (i.e., during a competition), it becomes paramount to understand and document how athletes' ongoing experiences on a regular basis are susceptible to influence their motivation toward their sport in general, and in turn, how their contextual motivation toward their sport will further impact their future situational motivation. Two studies were designed to examine the reciprocal TD and BU effects between contextual and situational motivation. Study 1 examined the links between contextual motivation and situational motivation over a short period of time (i.e., during a weekend basketball tournament) while Study 2 examined this dynamic relationship between both aforementioned types of motivation over an entire basketball season.

Overview of the studies

This investigation aimed at a better understanding of the dynamic relationship between two levels of motivation. Based on postulates put forth in the Hierarchical Model of Intrinsic and Extrinsic Motivation (Vallerand, 1997), we conducted two studies whereby the links between measures of contextual motivation (i.e., motivation toward the sport of basketball) and situational motivation (i.e., motivation experienced during a game of basketball) were examined. Specifically, reciprocal TD and BU effects between both levels of motivation were expected. With respect to TD effects, it was hypothesized that contextual motivation assessed prior to a tournament (Study 1) and at the beginning of the season (Study 2) would impact situational motivation assessed immediately following basketball games. In turn, BU effects were anticipated whereby situational motivation would predict contextual motivation assessed, respectively, ten days (Study 1) and nine months (Study 2) later. For instance, an athlete who enjoys playing basketball and practices regularly because it is important for him/her and for the team (contextual level) will likely feel self-determined while playing a game (situational level). However, performing poorly during a basketball game and throughout a number of consecutive games may result in a loss of self-determination at the situational level (i.e., during the game) which in turn, may result in a loss of self-determination at the contextual level (i.e., toward their sport). In other words, self-determination at the contextual level will impact upon self-determination at the next level in the hierarchy, namely at the situational level. In turn, changes in self-determination at the situational level will predict changes in self-determination at the contextual level.

Study 1

The purpose of Study 1 was to test the dynamic relationship between motivation assessed at a contextual level and motivation assessed at a situational level. We also examined the influence of

situational factors such as perceptions of personal and team performance on athletes' situational motivation. This study was conducted in the context of a pre-season basketball tournament. It was hypothesized that contextual motivation assessed prior to the tournament, would positively predict athletes' situational motivation assessed immediately after game 1. Situational motivation assessed after game 1 was expected to be linked to athletes' contextual motivation also assessed after game 1 which in turn, would positively predict their situational motivation assessed immediately after game 2. Situational motivation assessed after game 2 was expected to predict athletes' contextual motivation assessed ten days following the tournament. Finally, perceptions of both personal and team performance were hypothesized to be positively associated with athletes' situational motivation assessed immediately following games 1 and 2.

Method

Participants and procedure

The sample was comprised of 162 high school level participants (68 girls and 94 boys). Their ages ranged from 13 to 18 years with a mean age of 16.1 years. On average, participants reported that they had been playing basketball for 4.1 years.

Coaches were contacted three weeks prior to the weekend of the tournament in order to inform them of the study. Athletes were approached upon their arrival at the sports complex. Participation was voluntary and required the completion of four questionnaires. Questionnaire 1 was completed prior to the tournament and contained a self-report measure of contextual motivation. Questionnaire 2 was completed immediately following game 1 of the tournament and contained self-report measures of athletes' situational motivation, perceptions of their personal and team performance as well as their contextual motivation. Questionnaire 3 was completed after game 2 of the tournament and contained the same self-report measures of Questionnaire 2 with the exception of athletes' contextual motivation which was completed approximately ten days following the tournament in a fourth questionnaire. This final survey was returned to the researchers by mail in postage-paid envelopes.

Contextual measures

Contextual motivation. Athletes' contextual motivation, specifically toward their sport, was assessed using an adapted version of the Sport Motivation Scale (SMS; Brière et al., 1995). The scale was reformatted for the present study using an approach developed by Ryan and Connell (1989) (see also, Vallerand & Bissonnette, 1992). Participants were presented with four different basketball-related questions: (1) "Why do you usually play basketball games against other teams?" (2) "Why do you usually practice with your basketball team?" (3) "When you're alone, why do you usually practice your basketball techniques?" (4) "In general, why do you play basketball?" Each question was then followed by four different reasons athletes may have for engaging in these specific basketball-related activities: (1) "Because I enjoy it" (intrinsic motivation). (2) "Because I chose to do what's best for the team and myself" (identified regulation). (3) "Because I feel that I have to" (introjected regulation), and (4) "I do it but I'm not sure if it's worth it" (amotivation).¹ Responses were rated on a 7-point Likert-type scale, ranging from 1 (*completely disagree*) to 7 (*completely agree*).

¹Items designed to tap external and integrated regulation were not included in the assessment of contextual motivation. First, external reasons for participating in a given sport are varied (i.e., to show others what I am capable

In the present study, we were interested in measuring each athlete's contextual motivation toward their sport. Therefore, scores from each subscale were averaged across their respective four items, weighed according to their position on the self-determination continuum and summed to form a self-determination index (SDI) of contextual motivation using the following formula: $SDI = +2^*(\text{intrinsic motivation}) + 1^*(\text{identified regulation}) - 1^*(\text{introjected regulation}) - 2^*(\text{amotivation})$. Scores range from -18 to $+18$ with higher scores indicative of greater self-determination toward their sport. Many studies support the use and validity of the SDI (i.e., Green-Demers, Pelletier, & Menard, 1997; Grolnick & Ryan, 1987; Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004b; Ryan & Connell, 1989; Vallerand, 1997; Vallerand & Bissonnette, 1992). Cronbach alpha coefficients were calculated for each subscale then averaged to yield the following estimates for the entire scale: .85 before the tournament, .83 between games 1 and 2, and .85 ten days following the tournament. Evidence for the scale's validity is also well documented (Pelletier & Sarrazin, in press).

Situational measures

Situational motivation. Athletes' situational motivation experienced during their games was assessed immediately after game 1 and 2 using the SIMS (Guay et al., 2000). The SIMS is comprised of 16 items divided into four subscales designed to tap four types of situational motivation: intrinsic motivation, identified regulation, external regulation, and amotivation.² In response to the stem "Why did you play this game of basketball?", participants were asked to indicate to what extent each item corresponded to their reason for playing the game, using a 7-point Likert-type scale, ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*). Sample items include: "...because basketball is fun" (intrinsic motivation), "...by personal choice" (identified regulation), "...because I feel that I have to play" (external regulation) and "...I don't know; I don't see what playing basketball brings me" (amotivation). Like the SMS, scores from each subscale were averaged across their respective four items, weighed according to their position on the self-determination continuum and summed to form a SDI of situational motivation using the following formula: $SDI = +2^*(\text{intrinsic motivation}) + 1^*(\text{identified regulation}) - 1^*(\text{external regulation}) - 2^*(\text{amotivation})$. Scores on the SIMS also range from -18 to $+18$ with higher scores indicative of greater self-determination towards the situation in question (i.e., the basketball game). Cronbach alpha coefficients were calculated for each subscale then averaged to yield the following estimates for the entire scale: .70 assessed after game 1 and .82 assessed after game 2.

Personal performance. Three items were created to measure athletes' perceptions of their personal performance, assessed immediately after each game. These items were: (1) How would you evaluate your performance during this game? (responses ranged from 1 (*very bad*) to 9 (*very good*)). (2) To what extent do you think you played well? (responses ranged from 1 (*I did not play well*) to 9 (*I played very well*)). (3) To what extent do you consider your performance to be a failure

(footnote continued)

of, for the prestige of being an athlete, etc...) and thus would not be captured adequately with just one item. Second, Vallerand (1997) has argued that adolescents aged 16–20 years may not be motivated out of integrated regulation given that their self is still developing.

²According to Guay et al. (2000), the SIMS does not include items designed to tap integrated and introjected regulation because the inclusion of these additional items would render the SIMS too long.

or a success? (responses ranged from 1 (*failure*) to 9 (*success*)). Responses were averaged across all three items to index athletes' global perceptions of their personal performance. Internal consistency estimates were .95 after the first game and .95 after the second game.

Team performance. This construct was assessed with two items. The first item was a subjective measure of athletes' perceptions of their team's performance. In response to the stem "During this game", participants were asked to indicate to what extent they thought their team played well ranging from 1 (*my team did not play well at all*) to 9 (*my team played very well*). The second item was the actual outcome of the game: 0 = loss and 1 = win. Both items were summed and transformed into z-scores in order to derive an overall 'team performance' score.

Results

Preliminary analyses and descriptive statistics

Prior to analyses, all variables were examined for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analyses (Tabachnick & Fidell, 2001). All variables were deemed normally distributed. Descriptive statistics for all variables used in Study 1 are summarized in Table 1.

Test of the proposed model

Correlations among all constructs are presented in Table 1 and were related in a manner consistent with our hypotheses. Relations among variables were tested in a path analysis using observed (non-latent) constructs conducted in EQS/Windows (Bentler & Wu, 1995). Three goodness-of-fit indices were used to evaluate the proposed model: the χ^2 statistic, the comparative fit index (CFI; Bentler, 1990; Bentler & Chou, 1987), and the standardized root mean square residual (SRMR). The χ^2 statistic serves as an overall indicator of fit between the predicted population covariance matrix and the observed sample matrix (Ullman, 1996). A non-significant

Table 1
Descriptive statistics and inter-correlations among variables in Study 1

	Descriptive statistics				Inter-correlations							
	Mean	SD	Skewness	Kurtosis	1	2	3	4	5	6	7	8
1. Contextual motivation 0	9.17	3.49	-1.23	2.89	–							
2. Situational motivation 1	7.88	5.03	-.77	.24	.30***	–						
3. Contextual motivation 1	9.17	4.43	-.74	-.05	.47***	.54***	–					
4. Situational motivation 2	5.92	5.47	-.08	-.97	.30***	.28***	.35***	–				
5. Contextual motivation 3	9.82	3.66	-.76	.36	.44***	.45***	.56***	.36***	–			
6. Personal performance 1	5.70	1.84	-.64	.03	.02	.31***	.22**	.01	.08	–		
7. Personal performance 2	5.32	2.12	-.35	-.68	.09	-.07	.02	.36***	.15	.25**	–	
8. Team performance 1	.40	.84	-1.10	.06	-.15	.28***	-.04	-.26***	-.08	.21**	-.16*	–
9. Team performance 2	-.25	.85	.20	-1.07	-.04	-.15	-.08	.32***	-.06	.18*	.57***	-.21**

Note: 0 = before the tournament; 1 = after the first game; 2 = after the second game; 3 = 10 days after the tournament.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

χ^2 is desirable, indicative of a non-significant difference between the hypothesized model and the data. The CFI evaluates the relative improvement in fit of the hypothesized model compared to the null model, in which all covariances between variables are equal to zero (Byrne, 1994). The CFI ranges from 0 to 1.0. Values over .95 are reflective of a good-fitting model (Hu & Bentler, 1999); however values exceeding a minimum of .90 are deemed acceptable (Kline, 2005). The SRMR represents the average discrepancy between the hypothesized covariance matrix and the observed covariance matrix (Hu & Bentler, 1999). The SRMR also ranges from 0 to 1.0. A well-fitted model is evidenced by a SRMR smaller than 0.10 (Kline, 2005).

The analyses were conducted on a covariance matrix of the observed variables and standardized parameters were estimated using the maximum likelihood (ML) estimation method. Results from this initial solution were indicative of a poor-fitting model: $\chi^2(21) = 75.64, p < 0.001$; CFI = .86; SRMR = .11. An examination of the largest standardized residuals as well as results from the Lagrange multiplier test, suggested that an improvement in the overall fit of the model would be benefited if two parameters were set free to estimate. The first parameter was the path linking team performance assessed after game 1 to situational motivation assessed after game 2 ($r = -.26, p < .01$). The second parameter was the correlation between both measures of team performance (assessed after game 1 and after game 2) ($r = -.21, p < .001$). The overall fit of this second model was evaluated and was deemed adequate using the less stringent cut-off value for the CFI: $\chi^2(19) = 58.13, p < .001$; CFI = .90; SRMR = .03. All path coefficients were significant with t values over 1.96. Results from this study are presented in Fig. 1. In line with our hypotheses, parameters of the model supported TD effects between athletes' initial contextual motivation toward the sport of basketball and their situational motivation assessed immediately after game 1 of the tournament ($\beta = .33, p < .001$). Similar results were observed for contextual motivation assessed after game 1 on situational motivation assessed immediately after game 2 ($\beta = .20, p < .01$). With respect to BU effects, path coefficients indicated that situational motivation assessed immediately after game 1 was positively associated with contextual motivation also assessed after game 1 ($\beta = .44, p < .001$) and situational motivation assessed immediately after game 2 predicted contextual motivation assessed ten days following the tournament ($\beta = .14, p < .05$). In accordance with the secondary goal of this study, situational factors such as athletes' perceptions of their personal and team performance were positively linked to their situational motivation assessed immediately after games.

Discussion

The primary goal of this first study was to test the hypothesized reciprocal TD and BU effects of Vallerand's (1997) Hierarchical Model of Intrinsic and Extrinsic Motivation between contextual and situational motivation. These postulates were tested and supported in a sample of athletes participating in a pre-season basketball tournament. Findings from the present study are encouraging. Results demonstrated that contextual motivation assessed *after* a sporting event is explained by both athletes' contextual motivation toward their sport (assessed after game 1 and prior to the tournament) followed by the situational motivation they experienced during their games. The important role of post-game contextual motivation may be associated to the fact that this was a pre-season tournament. Hence, the outcome of the first game is probably indicative of both the athletes' performance and the overall strength of the team. As well, situational

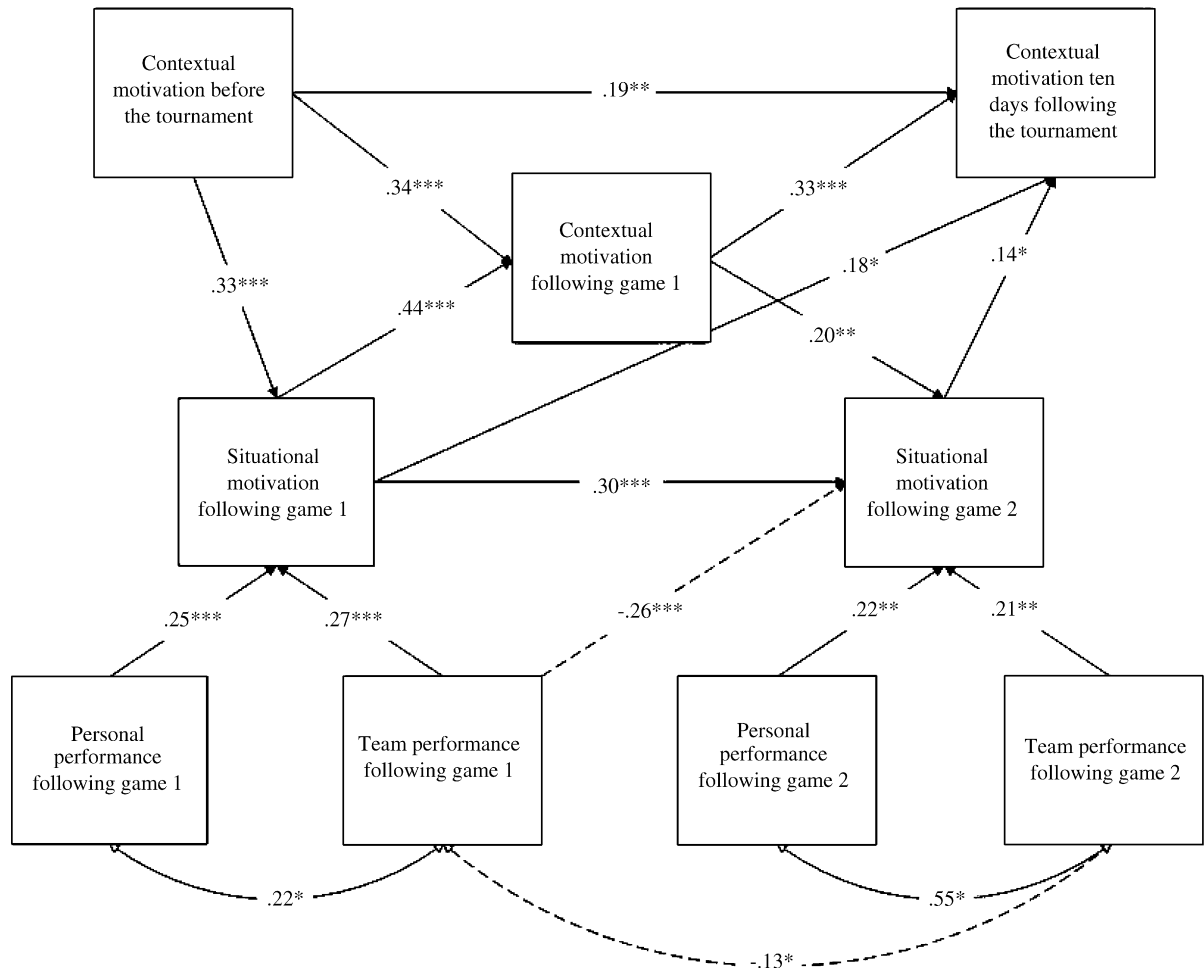


Fig. 1. Structural model with path coefficients from Study 1.

motivation assessed after game 2 emerged as the weakest predictor of contextual motivation assessed ten days following the tournament. This finding may be due to the fact that state motivation associated with one specific event (i.e., basketball game) might attenuate after a whole week thus weakening its impact on motivation at a higher level of generality.

Other findings from this first study warrant discussion. For instance, perceptions of the team's performance for game 1 were negatively linked to perceptions of the team's performance for game 2. The specific context of the tournament and more precisely the significance attached to the outcome of each game may shed light on these results. For example, the outcome of the first game had little significance for athletes in the tournament; they were still guaranteed to play a second game, whether or not they won or lost their first game. As such, athletes may have evaluated their team's performance positively. However, the outcome of the second game determined the team's status in the tournament. A loss meant that the team was eliminated from the tournament. A

closer examination of the means for both assessments of team performance suggest that athletes who completed the questionnaire most likely won their first game but lost their second game, evidenced by the respective positive and negative *z*-scores for this variable. As such, athletes may have evaluated their team's performance more negatively following their second game compared to their first game; thus accounting for the negative link between both assessments of team performance. Results also yielded an intriguing finding, that is the negative link that emerged between perceptions of team performance assessed after game 1 and situational motivation assessed immediately after game 2. We speculate that this result is most likely mirroring the outcome of the second game, because situational motivation was assessed *after* the game and not *before* the game. As such a loss for the second game may have shifted players' situational motivation to one that is less self-determined. In order to better grasp the relationship between situational factors on subsequent situational motivation, future research should aim to assess situational motivation prior to or during the specific event (i.e., game).

Results from Study 1 are promising as they provide preliminary support for a model hypothesized to illustrate the dynamic interplay between different levels of motivation. However, a more thorough understanding of this relationship would be benefited by a longitudinal study designed to capture the situational aspects of engaging in regular activities within a particular context rather than a specific event such as a tournament.

Study 2

The purpose of Study 2 was to replicate the findings of Study 1 using a multiple-wave design. In addition to the expected reciprocal TD and BU effects between contextual and situational motivation, we also examined the mediating role of perceptions of basic need satisfaction (i.e., autonomy, competence, and relatedness) on the relationship between situational factors (i.e., perceptions of personal and team performance) and situational motivation experienced during a game. Moreover, we sought to examine how both levels of motivation worked together to predict an important long-term affective consequence, namely athletes' interest toward their sport.

The study was conducted over an entire basketball season. TD effects were anticipated whereby athletes' contextual motivation assessed at the beginning of the season would positively predict their situational motivation averaged across all games during the first half of the season. Contextual motivation assessed at mid-season was expected to predict athletes' situational motivation averaged across all games during the second half of the season. With respect to BU effects, situational motivation averaged across all games during the first half of the season would positively predict athletes' contextual motivation assessed at mid-season. In the same manner, situational motivation averaged across all games during the second half of the season would positively predict athletes' contextual motivation assessed at the end of the season. Moreover, contextual motivation assessed at the end of the season was expected to predict players' interest in their sport. Finally, situational factors such as perceptions of personal and team performance were expected to be linked to athletes' perceptions of autonomy, competence, and relatedness experienced during games, which in turn would be linked to their situational motivation also experienced during games.

Method

Participants and procedure

The sample was comprised of 150 collegiate basketball athletes. Participants' ages ranged from 16 to 22 years with a mean age of 18.31. On average, they reported that they had been playing basketball for 5.91 years. Participants were invited to participate voluntarily and anonymously in this longitudinal study. Those who were interested completed several questionnaires throughout the entire basketball season, which began in October and ended the following April.

Three questionnaires containing self-report measures of contextual motivation were distributed at the beginning of the season (October), at the beginning of mid-season (January) and at the end of the season (May). For this last data collection we also included a measure of 'interest in basketball'. In addition, athletes completed a questionnaire immediately following every game of the season. These questionnaires were identical and contained self-report measures of their situational motivation experienced during the game, perceptions of their personal and team performance, as well as their perceptions of autonomy, competence, and relatedness experienced during the game. For the situational measure of motivation, two composite scores were computed: one for the games played during the first half of the season and a second one for the games played during the second half of the season.

Contextual measures

Contextual motivation. Athletes' contextual motivation, specifically toward their sport, was assessed using the adapted and reformatted version of the SMS (Brière et al., 1995). Details on this measure and the calculations of the self-determination index are presented in the Method section of Study 1. Cronbach alpha coefficients were averaged across subscales to yield the following estimates for the entire scale: .66 at the beginning of the season, .72 at mid-season and .73 at the end of the season.

Interest. Four items were created for the purpose of this study in order to assess athletes' interest toward their sport. Participants were asked to indicate their level of agreement with each item using a 7-point Likert-type scale ranging from 1 (*do not agree at all*) to 7 (*strongly agree*). These items were: (1) Normally when I play basketball, I feel that I like it; (2) I find basketball exciting; (3) I find basketball boring (reverse-coded) and (4) Basketball wakes my interest. Responses were averaged across all four items to yield an overall "interest" score. Internal consistency for this scale was satisfactory ($\alpha = .82$).

Situational measures

Situational motivation. Athletes' situational motivation experienced during their games was assessed immediately after each game using the SIMS (Guay et al., 2000). Details on the SIMS and the calculations of the SDI are presented in the Method section of Study 1. Cronbach alpha coefficients were calculated for each subscale then averaged for the entire scale across all games over the whole season ($\alpha = .80$).

Personal and team performance. Athletes' perceptions of their personal and their team's performance was assessed with two items. Participants were asked to indicate their level of

agreement with each item using a 7-point Likert-type scale ranging from 1 (*do not agree at all*) to 7 (*strongly agree*). These items were: (1) During the game, my personal performance was very good and (2) My team played very well during the game. Scores from both items were averaged to yield a unique score. Cronbach alpha coefficient for this measure across all games during the first half of the season was .62.³

Psychological mediators. Participants' perceptions of autonomy, competence, and relatedness experienced during their games were assessed with 12 items that were adapted from Blais and Vallerand (1992), Losier, Vallerand, and Blais (1993), and Richer and Vallerand (1998). In response to the stem: "How did you feel during this game?" participants indicated their level of agreement with each item using a 7-point Likert-type scale ranging from 1 (*do not agree at all*) to 7 (*strongly agree*). Perceptions of autonomy were assessed with the following four items: (1) I feel I am free to improvise; (2) I feel obliged to play; (3) I need to be pushed in the back to play and (4) I feel free to play. Items 2 and 3 were recoded to yield positive results. Perceptions of competence were assessed with the following four items: (1) I felt I had difficulty playing; (2) I felt I was good; (3) I felt I was excellent and (4) I felt I was not very efficient. Items 1 and 4 were recoded to yield positive results. Perceptions of relatedness were assessed with the following four items: (1) I felt I was accepted by other players; (2) I felt I was in harmony with other players; (3) I felt I was ignored by other players and (reverse-coded); (4) I felt I was appreciated by other players. Responses were averaged across all 12 items to yield an overall "psychological mediators" score with adequate internal consistency ($\alpha = .80$).

Results

Preliminary analyses and descriptive statistics

Preliminary analyses were conducted on all variables to test for accuracy of data entry, missing values, and assumptions regarding normality (Tabachnick & Fidell, 2001). All variables were deemed normally distributed. Descriptive statistics for all variables used in Study 2 are summarized in Table 2.

Test of the proposed model

Correlations among all constructs are presented in Table 2 and were related in a manner consistent with our hypotheses. As in Study 1, relations among observed (non-latent) variables were tested in a path analysis conducted in EQS/Windows (Bentler & Wu, 1995). The covariance matrix of the observed variables served as input data and standardized parameters were estimated using the ML estimation method. The fit of the model was assessed using the χ^2 statistic, the CFI, and the SRMR. Results from this initial solution were indicative of a well-fitting model, using the less stringent cut-off value for the CFI: $\chi^2(16) = 40.44$, $p < .001$; CFI = .92; SRMR = .06. All path coefficients were significant with t values over 1.96. Results from this second study are presented in Fig. 2. In line with our hypotheses, parameters of the model supported TD effects between athletes' contextual motivation assessed at the beginning of the season and athletes'

³For purposes of parsimony, athletes' perceptions of their personal and team performance were assessed only during the first half of the season.

Table 2
Descriptive statistics and inter-correlations among variables in Study 2

	Descriptive statistics				Inter-correlations							
	Mean	SD	Skewness	Kurtosis	1	2	3	4	5	6	7	
1. Contextual motivation 0	11.01	3.76	-.92	1.68	–							
2. Personal and team performance 1	4.66	0.78	-.80	1.54	.23**	–						
3. Psychological mediators 1	4.95	0.71	-.15	.81	.34***	.50***	–					
4. Situational motivation 1	7.94	3.73	-.20	.84	.35***	.45***	.58***	–				
5. Contextual motivation 2	10.43	4.14	-.54	.93	.24**	.07	.28***	.37***	–			
6. Situational motivation 2	6.53	4.27	-.08	-.54	.22**	.16*	.31***	.50***	.39***	–		
7. Contextual motivation 3	10.74	3.89	-.57	.49	.29***	.21**	.28***	.34***	.24**	.37***	–	
8. Interest	6.10	0.76	-.63	.25	.27***	.08	.22**	.17*	.26**	.22**	.56***	–

Note: 0 = beginning of the season; 1 = after games during the first half of the season; 2 = after games during the second half of the season; 3 = end of the season.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

reported situational motivation experienced during games of the first half of the season ($\beta = .17$, $p < .01$). Contextual motivation assessed at mid-season also predicted athletes' situational motivation experienced during games of the second half of the season ($\beta = .23$, $p < .01$). With respect to BU effects, situational motivation experienced during games of the first half of the season predicted athletes' contextual motivation assessed at mid-season ($\beta = .32$, $p < .001$) while athletes' situational motivation experienced during games of the second half of the season predicted athletes' contextual motivation assessed at end of the season ($\beta = .24$, $p < .01$) which in turn affected their sustained interest ($\beta = .56$, $p < .001$). In accordance with our secondary purpose, psychological need satisfaction experienced during games mediated the link between perceptions of personal and team performance on players' situational motivation experienced during games of the first half of the season.

Discussion

Results from this second study are in line with and extend those of Study 1 with respect to the proposed dynamic relationships between contextual and situational motivation. In addition, findings from this study revealed that athletes' situational motivation experienced during games of the second half of the season, followed by their incoming contextual motivation, played a determining role on their end-season contextual motivation, which in turn predicted their sustained interest. In accordance with the secondary aim of the study, perceptions of athletes' personal and team performance were found to be important determinants of their situational motivation, mediated by their feelings of autonomy, competence, and relatedness they experienced during games.

General discussion

The main purpose of this investigation was to examine the reciprocal TD and BU relationships between contextual and situational motivation proposed in Vallerand's (1997) Hierarchical Model of

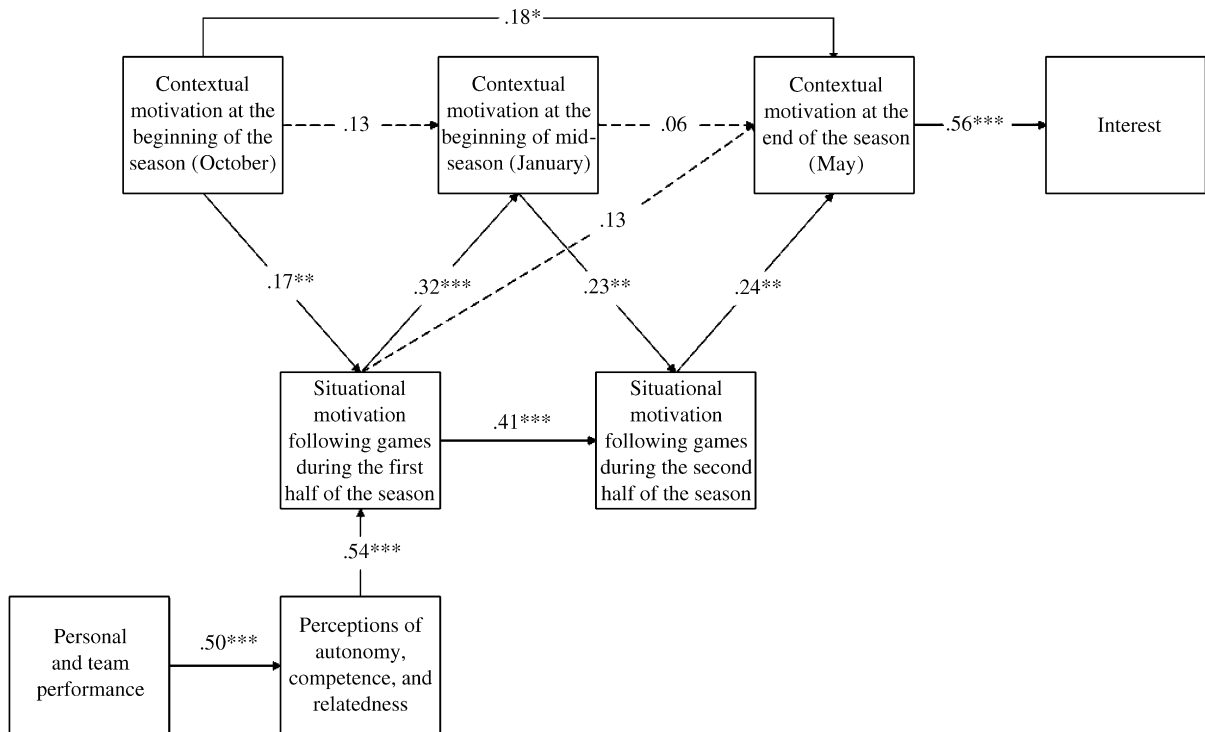


Fig. 2. Structural model with path coefficients from Study 2.

Intrinsic and Extrinsic Motivation. These postulates were tested and supported in two longitudinal studies. With respect to the findings of Study 1, TD effects were found for both assessments of contextual motivation (i.e., assessed prior to the tournament and after game 1) on situational motivation assessed immediately after games 1 and 2, respectively. In turn, BU effects for both assessments of situational motivation on contextual motivation assessed after the first game and ten days following the tournament were documented. Similar results were obtained for Study 2. Contextual motivation assessed at the beginning of the season and at mid-season, respectively, predicted athletes' situational motivation averaged across games during the first half of the season and their situational motivation averaged across games during the second half of the season (TD effects). In turn, situational motivation averaged across games during each half of the season, respectively, predicted contextual motivation assessed at mid-season and at the end of the season (BU effects). Together, results from these studies provide support for the reciprocal TD and BU relationships proposed by Vallerand (1997) between adjacent levels of motivation within the hierarchy.

The determinants of situational motivation were also investigated. In both studies, perceptions of both personal and team performance were positively associated with athletes' reported situational motivation experienced during the game. Moreover, the results from Study 2 provide support for the mediating role of perceptions of autonomy, competence, and relatedness between these situational factors and situational motivation. These findings are in line with those of Kowal and Fortier (2000). Future studies should further examine how other situational factors (i.e., degree of psychological preparation, situational coach orientation, team players' interpersonal

behaviors) impact feelings of self-determination at the situational level through the satisfaction of the three basic needs. In addition, it would be worthwhile to investigate how such situational factors affect each of the three needs separately. The results from Study 2 also showed contextual motivation to be a strong predictor of a sport-related consequence, notably interest. In other words, the more athletes report feeling self-determined toward their sport, the more they report feeling interested in their sport. This result is in line with the motivational consequences proposed in Vallerand's (1997) model as well as many other studies which have tested the impact of contextual sport motivation on some behavioral, affective, and cognitive consequences (see Pelletier & Sarrazin, in press, for a review).

The results from this investigation offer some valuable insight as to the dynamic and reciprocal interplay between two adjacent levels of motivation as proposed by Vallerand (1997). The findings obtained herein suggest that motivation at two levels in the hierarchy mutually influence one another over time. Athletes' feelings of self-determination in specific situations such as games (i.e., situational level) played a determining role on their feelings of self-determination toward their sport (i.e., contextual level). In turn, feelings of self-determination at the sport level influenced athletes' feelings of self-determination at the game level. We speculate that contextual motivation would likely play an influential role on how athletes approach specific situations which in turn would impact the motivation they experience during those situations. Future studies should further investigate the mechanism through which motivation at adjacent levels in the hierarchy influence one another. In the present investigation, it is important to note that the impact of situational motivation was specific to games only. Many other situations may be relevant to impact motivation at the situational level, potentially affecting contextual motivation. For instance, the situational motivation experienced during training may also be an important predictor of an athlete's contextual motivation. Other situations associated with the sport experience could be tested in order to further understand the impact of motivation associated with specific instances on contextual motivation.

Future research should also investigate the same dynamic interplay between contextual and global levels of motivation as proposed by Vallerand (1997) in the sport domain. Two approaches may be pursued in order to address such a research endeavour. First, researchers could aim at examining the general dynamic relationship between contextual motivation and global motivation, an approach similar to the one used in the present research. Second, researchers could also aim at testing the dynamic relationship between contextual motivation and global motivation while attempting to recruit athletes experiencing a major change in their sport (i.e., retirement). In such a study, it would be most interesting to introduce change analyses in order to evaluate how a major change in one's sport would affect the dynamics between contextual and global motivation. In future studies, it would also be important to assess contextual motivation using a revised version of the SMS (Pelletier, Kabush, Vallerand, & Sharp, 2007; Pelletier & Sarrazin, in press). This newer version includes a subscale designed to assess integrated regulation. This is an important addition because integrated regulation represents the most self-determined form of extrinsic motivation and would thus be appropriate to use if adult participants were recruited.

Implications and limitations

Overall, the present findings have a number of important implications. For instance, from a developmental point of view, the dynamic interplay between situational and contextual motivation are extremely relevant. According to Harter (1999), motivation develops from

situational encounters with an activity. Thus, it is plausible that situational motivation experienced during the first encounter with an activity would account for an important part of the variance in contextual motivation for that activity. Furthermore, the mechanism by which situational experiences transform into an actual component of the self remains speculative. As suggested by Vallerand (1997) this is likely to occur when situational events become important for the individual and when the structure of the activity becomes more complex and stable. Such implications are of paramount importance for the development of interest in physical activity and sports in young children and even adults. In order for individuals to develop an interest in a specific sporting activity, positive situational experiences are paramount. A cumulation of such positive experiences may lead one to become more willing to integrate the activity into the self.

A second implication for these results pertains to the additional support the present studies provide to SDT (Deci & Ryan, 1985b, 2002). Past research documented how motivation at the global level and motivation at the contextual level influence one another (i.e., Guay et al., 2003; Williams, Grow, Freedman, Ryan, & Deci, 1996). Our studies are the first to document the dynamic interplay between motivation at the contextual level and motivation at the situational level. Specifically, higher levels of self-determined motivation at the contextual level led to higher levels of self-determined motivation at the situational level.

Results from this research make a significant contribution to the field of sport psychology. However, certain methodological shortcomings must be considered. First, samples from both studies were comprised of high school (Study 1) and college students (Study 2). Future research should aim to extend the TD and BU effects to the general population, thus providing additional support for this postulate. A second limitation pertains to specificity of the context in which both studies took place. Both studies pertained to the sport of basketball. More research is needed to test the reciprocal TD and BU effects in other sports and physical activities. It would also be important to establish if results would be comparable with other life contexts such as education work, and relationships. Finally, the fit of the models in both studies only exceeded the less stringent cut-off value for the CFI. A better-fitting model would likely result using a larger sample (i.e., $N > 200$).

Conclusion

In conclusion, the postulate pertaining to the reciprocal TD and BU relationships between adjacent levels of motivation in the Hierarchical Model of Intrinsic and Extrinsic Motivation (Vallerand, 1997; Vallerand & Ratelle, 2002) were tested and supported in two studies conducted in the sports domain. It is hoped that future research efforts will be devoted to the further testing of Self-Determination Theory (SDT) and the postulates of the Hierarchical Model of Intrinsic and Extrinsic Motivation. It appears that avenues focusing on the intricacies of the structural aspect of motivation within the self would benefit the field at this point.

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