CHAPTER 3

Intrinsic and Extrinsic Motivation in Sport and Physical Activity
A Review and a Look at the Future

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Motivation has been repeatedly reported as a key element of athletes’ success in sports (Gould, Dieffenbach, & Moffett, 2002) and exercisers’ persistence with an exercise regimen (Wilson & Rodgers, in press). Thus, it is not surprising that much research has been conducted on motivation in sport and physical activity. Intrinsic motivation (doing something for its own sake) and extrinsic motivation (doing something as a means to an end and not for its own sake), in particular, have been very popular topics and have allowed researchers to make sense of several phenomena of importance in sport and physical activity (see Vallerand, Deci, & Ryan, 1987; Vallerand & Rousseau, 2001). The purpose of this chapter is to present a review of research on intrinsic and extrinsic motivation with a keen eye on the most recent research and trends. I start by defining motivation in general and intrinsic and extrinsic motivation in particular. I then present a brief overview of the organismic approach, specifically self-determination theory (SDT; Deci & Ryan, 2000). I present the hierarchical model of intrinsic and extrinsic motivation (HMIEM; Vallerand, 1997, 2001, in press; Vallerand & Ratelle, 2002), which serves as the organizing framework for the review. I then focus on recent research that has appeared since our initial review (Vallerand & Rousseau, 2001). Finally, I conclude by highlighting recent research trends considered to be important and provide suggestions for future research directions that appear promising.

MOTIVATION AND SELF-DETERMINATION THEORY

The concept of motivation can be defined as “the hypothetical construct used to describe the internal and/or external forces that produce the initiation, direction, intensity, and persistence of behavior” (Vallerand & Thill, 1993, p. 18; translated from French). The emphasis on internal and external forces fits in very well with the presence of two major types of motivation that have been heavily researched, namely, intrinsic and extrinsic motivation. Whereas initially research and models focused on the reactive or passive role of humans in their action with the environment, later research showed that people don’t merely react to rewards (Weiner, 1972). In fact, a movement gathered momentum in the late 1950s and early 1960s positing that the innate needs of competence (White, 1959), autonomy (Angyal, 1941; deCharms, 1968), and relatedness (Harlow, 1958) were important in leading the person to be proactive in exploring the environment. This led to the development of a second position, termed the organismic approach, where it is proposed that individuals are actively engaged and proactive in their interaction with the environment because “people are inherently motivated to feel connected to others within a social milieu [relatedness], to function effectively in that milieu [competence], and to feel a sense of personal initiative while doing so [autonomy]” (Deci & Ryan, 1994, p. 7).

Self-determination theory (Deci & Ryan, 1985, 2000) has pursued the work of early need theorists. It posits that competence, autonomy, and relatedness are universally essential for optimal human development, motivation, and integrity. That is, a need serves the function of promoting psychological health; conversely, when needs are not met, psychological health is undermined. Research supports this crucial hypothesis with students (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000) and athletes (Gagné, Ryan, &
Over the years, research conducted on intrinsic and extrinsic motivation has shown that personality, situational-level-based motivation, and intermediate contextual level (or life domain) motivations are influenced by a host of factors and lead to various outcomes. Various conceptual frameworks in addition to SDT have been advanced to explain the major findings (see Vallerand, 1997). Building on such research and theory and especially SDT, a model has been proposed relative to the integration of the different levels at which motivation research has been conducted. The HMIEM (Vallerand, 1997, 2001, in press; Vallerand & Perreault, 1999; Vallerand & Ratelle, 2002) comprises five postulates and five corollaries. Taken together, these postulates and corollaries explain (a) the motivational determinants and consequences at three levels of generality as well as (b) the interactions among motivation at the three levels of generality, while taking into account the complexity of human motivation (see Figure 3.1). The model is briefly described next.

A Multidimensional Perspective of Motivation

A first postulate of the HMIEM is that the concepts of intrinsic motivation, extrinsic motivation, and amotivation are needed to make sense of a full range of motivational processes. Intrinsic motivation refers to performing an activity for itself and the pleasure and satisfaction derived from participation (Deci, 1971). Vallerand and his colleagues (Vallerand, Blais, Brière, & Pelletier, 1989; Vallerand et al., 1992, 1993) posited the existence of three types of intrinsic motivation: intrinsic motivation to know, intrinsic motivation to accomplish things, and intrinsic motivation to experience stimulation. Intrinsic motivation to know refers to engaging in an activity for the pleasure and satisfaction that one experiences while learning, exploring, or trying to understand something new. Basketball players who practice because they enjoy learning new offensive moves display intrinsic motivation to know. Intrinsic motivation to accomplish things pertains to engaging in a given activity for the pleasure and satisfaction experienced while one is attempting to accomplish or create something or to surpass oneself. Finally, intrinsic motivation to experience stimulation is at work when one engages in an activity to experience pleasant sensations associated mainly with one’s senses (e.g., sensory and aesthetic pleasure). Swimmers who swim because they enjoy the pleasant sensations they experience while their bodies glide through water display this type of intrinsic motivation. This tripartite distinction highlights the different fashions in which intrinsic motivation may be experienced in sport and exercise. Much research (Fairchild, Horst, Finney, & Barron, 2005; Hein, Müür, & Koka, 2004) supports this taxonomy.

Extrinsic motivation refers to engaging in an activity as a means to an end and not for its own sake. There are different types of extrinsic motivation, some of which are more self-determined in nature (Deci & Ryan, 1985, 2000). In other words, individuals may choose to perform an activity, even though they do not do it for pleasure. Deci and Ryan (1985) have proposed four types of extrinsic motivation. External regulation refers to behavior that is regulated through external means, such as rewards and constraints. For instance, an athlete might say, “I’m going to today’s practice because I want the coach to let me play tomorrow.” With introjected regulation, individuals begin to internalize the reasons for their actions. However, this type of extrinsic motivation is not self-determined because individuals still experience pressure, although this time the pressure is self-imposed (e.g., through guilt and anxiety). An example of introjected regulation is the athlete who goes to a practice because he would feel guilty if he missed it. It is only with identified regulation that behavior is done out of choice. When they display
identified regulation, athletes freely perform the activity even if it is not pleasant in itself. An example of identified regulation is the soccer player who does not like weight lifting but who nevertheless chooses to do it because she knows that building her strength will allow her to become a better player. Integrated regulation also involves doing an activity out of choice; however, in this case, the choice represents a harmonious part of the individual’s self. In other words, one’s choices are made as a function of their coherence with other aspects of the self. An example of integrated regulation is the ice hockey player who chooses to postpone a night out with his friends on Friday to be in top shape for the big game on Saturday afternoon.

Finally, amotivation refers to the lack of intentionality and thus the relative absence of motivation. When amotivated, athletes experience feelings of incompetence and expectancies of uncontrollability. They are relatively without purpose with respect to the activity and therefore have little motivation (intrinsic or extrinsic) to perform it.

Motivation at Different Levels of Generality

A second issue underscored by Postulate 2 of the HMIEM is that intrinsic and extrinsic motivation and amotivation exist at three levels of generality: global, contextual, and situational. Motivation at the global level refers to a general motivational orientation to interact with the environment in an intrinsic, extrinsic, or amotivated way. It is similar to a personality trait where one is predominantly intrinsically- or extrinsically motivated, or even amotivated. Motivation at the contextual level is an individual’s usual motivational orientation toward a specific context or a set of specific and related activities. Research on intrinsic and extrinsic contextual motivation has typically focused on three contexts: education (or work), interpersonal relationships, and leisure (of which sport is an important part; see

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Vallerand, 1997). Finally, motivation at the situational level refers to the motivation individuals experience when engaging in a specific activity at a given moment in time. Situational motivation refers to a motivational state. It is important to distinguish among these three levels as such a conceptualization provides a more refined understanding of motivational processes involved in human behavior.

Assessing Motivation

It is important to have a brief look at methodological advances that have taken place to assess the different types of motivation across the three levels of generality. This will facilitate the understanding of the review presented in the later sections.

At the situational level, researchers have developed the Situational Motivation Scale (SIMS; Guay, Vallerand, & Blanchard, 2000), which measures intrinsic motivation (without distinguishing the three types), identified and external types of extrinsic motivation, and amotivation. The choice to measure only four motivational types was dictated by the need to keep the scale as brief as possible (16 items, although an introjected regulation scale is also available) to capture situational motivation in many lab and field situations without overloading participants with a long questionnaire. The results of several studies (Edwards, Portman, & Bethea, 2002; Guay et al., 2000; Lévesque & Pelletier, 2003; Standage & Treasure, 2002; Standage, Treasure, Duda, & Prusak, 2003) have shown that the scale displays adequate factorial structure and internal consistency and leads to theory-informed predictions. Although several studies typically yielded support for the factorial structure of the scale (see Guay et al., 2000), some authors (Standage, Treasure, et al., 2003) suggested that the factorial structure of a 14-item version of the scale might be more appropriate than the 16-item original version. Close inspection of the Standage, Treasure, et al. (2003) data supports this. However, the data also reveal that overall the factorial structure of the 16-item scale is still appropriate. Because the use of the scale in sport has just begun and support for the full-scale version has been obtained in several studies, it is recommended that researchers use the full-scale and not the 14-item version at this point.

Scales assessing motivation at the contextual level have also been developed. Because we were mainly interested in college students and because research revealed that college students rated education, leisure, and interpersonal relationships as their three main life contexts (Blais, Vallerand, Gagnon, Brière, & Pelletier, 1990), scales were developed to measure motivation in these contexts. The Academic Motivation Scale (AMS; Vallerand et al., 1989, 1992, 1993) assesses contextual motivation toward education; the Interpersonal Motivation Inventory (Blais, Vallerand, Pelletier, & Brière, 1994) assesses contextual motivation in interpersonal relationships; and the Leisure Motivation Scale (Pelletier, Vallerand, Green-Demers, Blais, & Brière, 1996) measures contextual motivation toward leisure activities. Because sport represents an important type of leisure activity for most people and a full-fledged life context for athletes, we have also developed a scale to assess sport motivation, both in French (the Echelle de Motivation dans les Sports; Brière, Vallerand, Blais, & Pelletier, 1995) and in English (Sport Motivation Scale; SMS; Pelletier et al., 1995). The SMS assesses the seven types of motivational constructs described earlier, although recently Pelletier and Kabush (2005, cited in Pelletier & Sarrazin, in press) added an integrated regulation subscale to the SMS. The SMS has been translated into several languages and fully validated in French, English, Greek, and Finnish and used in a variety of sports too numerous to mention. Overall, the validity and reliability of the SMS has been repeatedly supported (see Pelletier & Sarrazin, in press, for a review). This also applies to measures of the other life contexts.

Scales assessing some of the constructs proposed by SDT and the HMIEM have been developed to measure motivation toward exercise, such as the Behavioral Regulation in Exercise Questionnaire (BREQ; Markland & Tobin, 2004; Mullan, Markland, & Inglese, 1997), the Exercise Motivation Scale (Li, 1999), and the Perceived Locus of Causality Scale (Goudas, Biddle, & Fox, 1994). These scales have shown adequate levels of validity and reliability.

Finally, the Global Motivation Scale (GMS; Guay, Vallerand, Pelletier, & Blais, 1999) has been developed to assess the three different types of intrinsic motivation, and the identified, introjected, and external types of extrinsic motivation, as well as amotivation toward life in general. More recently, Pelletier and his colleagues (Pelletier, Dion, & Lévesque, 2004) have added an integration subscale. Results with the GMS indicate that the scale is both reliable and valid and relatively free from social desirability (Guay, Mageau, & Vallerand, 2003; Guay et al., 1999).

Motivation as a Social Phenomenon

A third issue of interest is that motivation is a social phenomenon. Corollary 3.1 of the hierarchical model states that motivation can result from social factors that can be global, contextual, or situational, depending on the level of
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Motivation as an Intrapersonal Phenomenon

Motivation is also an intrapersonal phenomenon. According to Corollary 3.3, motivation at one level of the hierarchy also results from top-down effects of motivation at the proximal level higher up in the hierarchy. For example, if one’s predominant contextual motivation toward a given sport is intrinsic motivation, then, all other factors being equal, one should have a tendency to display intrinsic motivation toward an activity related to one’s sport at a specific point in time (at the situational level). Moreover, the dynamic nature of the relationship among motivations at different levels can result not only in top-down effects, but also in bottom-up effects. Thus, Postulate 4 states that over time, there is a recursive bottom-up relationship between motivation at a given level and motivation at the next higher level in the hierarchy. For example, an athlete repeatedly experiencing situational intrinsic motivation in a particular sport should eventually develop an increase in contextual intrinsic motivation toward this sport. In addition, contextual motivations can have facilitative or debilitative effects toward one another, depending on their level of self-determined motivation. The more self-determined one’s motivation toward a given life context, the more it will facilitate one’s motivation toward another life context because it is more fully integrated in the self. Finally, global motivation can also serve an integrative function regarding the interplay between two or more life contextual motivations and the experiences related to them (see Koestner, Bernieri, & Zuckerman, 1992).

Motivational Consequences

Motivation can also lead to important consequences of at least three types: affective, cognitive, and behavioral (Postulate 5; Vallerand, 1997). Furthermore, according to Corollary 5.1, consequences are hypothesized to be decreasingly positive from intrinsic motivation to amotivation. Finally, consequences can occur at all three levels of generality depending on the level of motivation that has produced them (Corollary 5.2).

In summary, the HMIEM deals with at least two important elements. First, it identifies the psychological mechanisms underlying the determinants and outcomes of motivation. In doing so, the model provides a rich framework to integrate existing knowledge on intrinsic and extrinsic motivation. Second, the hierarchical model proposes new directions for future research. Table 3.1 summarizes the

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postulates and corollaries of the model. This framework is used in this chapter to review the literature on intrinsic and extrinsic motivation in sport and physical activity.

**RESEARCH ON MOTIVATION AT THE SITUATIONAL LEVEL**

As discussed previously, situational motivation refers to the motivation individuals experience while engaging in a given activity at a specific point in time. An example would be the basketball player who is practicing her jump shot at 3:00 P.M. on a Saturday for the sheer pleasure of executing the movement and feeling the flow of the movement. In this section, the studies dealing with the determinants and consequences of situational motivation in sport and physical activity are reviewed.

**Determinants**

Several motivational determinants have been studied. Below, we focus on rewards and awards, competition, positive and negative feedback, and choice.

**Rewards and Awards**

The use of rewards, in particular, has attracted a lot of attention at the situational level over the past 10 years. Deci, Koestner, and Ryan (1999, 2001) conducted a meta-analysis of 128 laboratory experiments that revealed that rewards that are provided contingent on engaging in the activity, completing the activity, or reaching a certain level of performance all decrease intrinsic motivation. However, rewards that are not expected and that are task-noncontingent (not related to the task) do not decrease intrinsic motivation. Finally, although all participants (no gender effects) experience negative effects, children are more affected than college-age students. Laboratory research involving tasks associated with sport or exercise has yielded findings similar to that of the Deci et al. (1999) meta-analysis. Thus, athletes and participants who engage in a sport-related activity to receive a trophy or a reward display a decrease in situational intrinsic motivation as assessed by self-report scales (e.g., Thomas & Tennant, 1978) and the free-choice measure (Orlick & Mosher, 1978). Additional research is needed to determine if the negative effects of rewards and awards findings replicate in actual sport settings and to identify the boundaries of such effects.

**Competition**

In the context of competitive sport, the focus is often on beating the opponent. Initial research using a cognitive task has shown that such a competitive focus undermines the intrinsic motivation of young adults (Deci, Betley, Kahle, Abrams, & Porac, 1981). Results from the Vallerand, Gauvin, and Halliwell (1986b) study showed that this conclusion also applies to 10- to 12-year-old children who engaged in a balancing task (i.e., the stabilometer). Winning or losing a competition represents another potent social determinant of motivation. Research in sport reveals that winners (e.g., Vallerand, Gauvin, & Halliwell, 1986a; Weinberg & Ragan, 1979) and those who subjectively feel that they have done well in competition (McAuley & Tammen, 1989) display higher levels of intrinsic motivation than losers and those who feel that they have not done well. A recent series of four studies on basketball by Tauer and Harackiewicz (2004) assessed the effects of competition, cooperation, and intergroup competition on children’s enjoyment on a basketball free-throw task. Three findings of interest were found. First, they replicated the findings on success and failure of competition mentioned earlier. Second, cooperation and competition did not differ across studies. And third, intergroup competition consistently led to the highest levels of enjoyment. The authors posit that engaging in intergroup competition leads individuals to derive the best of both worlds: They experience the excitement of competition as well as the interpersonal enthusiasm derived from having a teammate.

The fact that the competition and intergroup competition conditions did not lead to lower levels of enjoyment than the cooperation condition is surprising. These findings could be due to measurement and methodological issues (a no-feedback, no-competition control group was not included, and, though related, enjoyment and intrinsic motivation are nevertheless different constructs). In addition, because the focus in the Tauer and Harackiewicz (2004) studies was on trying to do well and not necessarily on beating others at all cost (as in past competition research), the controlling dimension of competition may have been downplayed in favor of the informational dimension of competition (see Deci, Betley, et al., 1981), thereby eliminating the negative effects of competition typically found in most studies. Clearly, future research on the effects of competition on intrinsic motivation is needed.

**Positive and Negative Feedback**

By providing athletes with feedback about their strengths and weaknesses, coaches, fitness instructors, and physical education teachers may influence athletes’ situational intrinsic motivation. Past research has indeed shown that positive feedback enhances and negative feedback decreases situational intrinsic motivation (Vallerand & Reid,
1984, 1988). For example, Thill and Mouanda (1990) showed that team handball players receiving bogus negative verbal feedback (indicating failure) after shooting at targets report lower levels of situational intrinsic motivation than players receiving bogus positive verbal feedback (indicating success).

However, other dimensions of the feedback in addition to its valence (positive or negative) are important to consider. For instance, a review of the literature by Henderlong and Lepper (2002) underscored that praise must be used with caution as it can increase, decrease, or have no effects on children’s intrinsic motivation. To the extent that the message is believed, an increase in intrinsic motivation will follow. However, if the feedback is not perceived as sincere, negative effects can occur. In addition, much research also reveals that the style of feedback delivery is important. Specifically, when the message is presented in an autonomy-supportive fashion (e.g., “It is important for your own good to do this”), athletes feel as if they are in control and can make choices within reasonable limits (Deci, Schwartz, Sheinman, & Ryan, 1981). On the other hand, messages are controlling when they force or coerce athletes to behave in a certain way (e.g., “You must do this. You have no choice”). Controlling statements typically undermine intrinsic motivation, whereas autonomy-supportive statements preserve it or even enhance it (see Mageau & Vallerand, 2003, for a review of such research).

**Choice**

Research in sport and exercise reveals that choice facilitates intrinsic motivation with respect to physical activity. For example, Dwyer (1995) showed that having the opportunity to choose the songs they wanted to hear while exercising increases feelings of choice and intrinsic motivation relative to participants in a control condition, even though both groups heard the same songs. Similar findings have also been reported with respect to physical education classes (e.g., Goudas, Biddle, Fox, & Underwood, 1995). Thus, it appears that choice represents an important factor to consider with respect to situational motivation.

**Mediational Evidence**

Because individuals need to feel competent, autonomous, and connected to significant others in their interaction with their environment, activities that allow them to satisfy these needs will be engaged in by choice out of intrinsic motivation or identified regulation when they have the opportunity to do so. Thus, need satisfaction is hypothesized to mediate the impact of social factors on motivation. Research has found support for this hypothesis. For instance, in a study with master swimmers, Kowal and Fortier (2000) showed that perceptions of competence, autonomy, and relatedness mediate the relationship between social factors (perceived success and motivational climate) and situational motivation following a meet. In another study, Guay et al. (2000, Study 4) looked at the role of the three psychological mediators in the changes in situational motivation over two subsequent collegiate basketball games. Results revealed a differentiated picture for each type of situational motivation. Athletes who experienced perceptions of relatedness, autonomy, and collective competence displayed an increase in intrinsic motivation from game 1 to game 2. Increases in identified regulation were predicted by perceptions of autonomy and relatedness, whereas increases in amotivation were negatively predicted only by perceptions of relatedness. Finally, changes in external regulation were not significantly predicted by any of the predictors. These findings are interesting in that they reveal that with respect to team sports, collective competence represents an important mediator that needs to be looked at more closely in future research. More generally, these findings underscore the fact that the hypothesized psychological mediators need to be taken into account to better understand changes that occur at the situational level over time.

Corollary 3.3 posits that there is a top-down effect from motivation at the contextual level on motivation at the situational level. For instance, an athlete who usually plays her favorite sport, tennis, because of high contextual intrinsic motivation should be predisposed to display high levels of intrinsic motivation at a given moment (high level of situational intrinsic motivation) while playing tennis. Research supports the top-down effect. For instance, Gagné et al. (2003) measured gymnasts’ contextual motivation toward gymnastics at Time 1 and their situational motivation at the beginning of practice each day for 15 days. In line with the top-down effect posited by the HMIEM, correlations between contextual motivation and situational motivation were always positive and varied from .22 to .50. These findings also suggest that although the top-down effect was present each day for 15 consecutive days, its impact varied daily, presumably due to the presence of situational factors that differed in importance on a given day.

Other studies have tested the validity of the top-down effect in physical education settings. For instance, Ntoumanis and Blaymires (2003) had participants complete the contextual measures of motivation toward physical activity (the Perceived Locus of Causality [PLOC] Scale of Goudas et al., 1994) and toward education (the AMS; Vallerand et al., 1992, 1993). One month later, students engaged in a
typical science class in the classroom and a typical physical education class in the gymnasium, and situational motivation toward each was assessed with the SIMS. Ntoumanis and Blaymires found that students’ situational motivation during the science class was positively predicted by their contextual motivation toward education, and their situational motivation toward physical activity in the gymnasium was predicted by their contextual motivation toward physical activity. These findings provide support for the HMIEM’s position that it is not simply any motivation at the contextual level that will influence situational motivation, but rather the contextual motivation that is pertinent to the activity being performed.

The HMIEM posits that life contexts can be seen as schemas that serve to store contextual cues in addition to the relevant contextual motivation. If this is so, then presenting relevant contextual cues should be sufficient to trigger the appropriate contextual motivation stored with the cues, thereby setting in motion the top-down effect on situational motivation. Furthermore, such a triggering can take place outside of awareness (see Bargh, 2005). Recent research by Ratelle, Baldwin, and Vallarand (2005) has supported this hypothesis. In two studies, Ratelle et al. showed that simply hearing a sound (in the background and out of awareness) initially paired with a controlling message on a first task was sufficient to produce a decrease in situational motivation on a second task. Why? Because according to the HMIEM, working on a new type of task (the first one) creates a new context in which cues inherent to that new context such as the sound paired with the task were stored with the contextual motivation related to such types of task. So, when a task relevant to that context is later available (the second task), the mere sound triggers the relevant contextual motivation stored in the schema along with the cue, and the top-down effect takes place. These findings provide support for the top-down effect and show that such an effect can be triggered non-consciously.

A final note on the top-down effect is in order. In a study on leisure, Iwasaki and Mannell (1999) obtained an interaction between the relevant contextual motivation and the actual situational factor that was manipulated (choice versus being controlled). More specifically, it was found that the top-down effect took place only in the choice condition where participants experienced some autonomy. It is thus possible that some situational conditions are more conducive to the top-down effect than others. Research on this issue in sport would appear to be in order.

**Summary**

In summary, the studies reviewed show that social factors such as rewards, competition, verbal feedback, and choice can influence individuals’ situational motivation. Moreover, perceived competence, autonomy, and relatedness have been shown to mediate the impact of social factors on situational motivation. Finally, support for Corollary 3.3 on the top-down effect has been found to support the impact of contextual motivation on situational motivation.

**Consequences**

According to the hierarchical model, situational motivation leads to situational consequences (outcomes that are experienced at one specific point in time and with respect to a specific activity) that can be affective, cognitive, and behavioral in nature (Vallerand, 1997). In addition, the most positive consequences should be produced by the most self-determined forms of motivation (i.e., intrinsic motivation and identified regulation), and the least self-determined forms of motivation (i.e., external regulation and especially amotivation) should lead to the most negative consequences (Corollary 5.1). Introjection should lead to intermediate effects.

**Affective Outcomes**

In line with the hierarchical model and SDT, several studies in sport and exercise have shown that intrinsic motivation predicts the occurrence of positive affect in sports (e.g., McAuley & Tammen, 1989; Scanlan & Lewthwaite, 1986). Other research by Kowal and Fortier (1999) showed that swimming for intrinsic reasons was associated with the highest levels of flow during practice, followed decreasingly by identified regulation, external regulation, and amotivation (the last two scales yielded mostly negative correlations). Similar findings were obtained with gymnasts (Gagné et al., 2003), with a number of affective variables (positive and negative affect, vitality, and self-esteem) experienced before practice over a period of 15 consecutive days.

Experimental conditions known to induce intrinsic motivation and identified regulation have also been found to lead to positive affective outcomes. For instance, in an exercise setting, Parfitt and Gledhill (2004) showed that low-active individuals who engaged in a 20-minute exercise bout under a choice condition (deciding which types of exercise to do) reported less fatigue, psychological distress, and perceived exertion than those in a no-choice condition.

In summary, the studies reviewed show that social factors such as rewards, competition, verbal feedback, and choice can influence individuals’ situational motivation. Moreover, perceived competence, autonomy, and relatedness have been shown to mediate the impact of social factors on situational motivation. Finally, support for Corollary 3.3 on the top-down effect has been found to support the impact of contextual motivation on situational motivation.
even though the total output as measured by heart rate was similar. Furthermore, these benefits seemed to increase over time. In another study, it was found that college students who engaged in a basketball dribbling task as part of a physical education course under conditions of personal relevance and instrumentality (the task is personally beneficial and will be directly useful in the course) experienced higher levels of intrinsic motivation and enjoyment than students who saw no relevance or instrumentality in that particular task (Simons, Dewitte, & Lens, 2003). In line with Deci, Eghrari, Patrick, and Leone (1994), it appears that choice and personal relevance may represent important motivational catalysts for tasks that may not be initially interesting.

Cognitive Outcomes

In the Kowal and Fortier (1999) study with master swimmers described earlier, higher levels of self-determined motivation predicted better concentration on the task at hand. These results may be explained by the fact that when intrinsically motivated, individuals focus more on the task and may become more impervious to external distractions (e.g., behaviors from the coach, teammates, or the crowd), and thus can devote all their attention and concentration to the task. These hypothesized mediating processes nevertheless remain to be empirically tested in future research.

Behavioral Outcomes

Finally, the HMIEM also posits that higher levels of self-determined situational motivation should result in positive behavioral consequences at a specific moment in time. Research is supportive of the hypothesis. For instance, in their study with gymnasts, Gagné et al. (2003) found that intrinsic motivation predicted attendance at practice each day over a 15-day period. In addition, the results from the Simons et al. (2003) study revealed that physical education students who saw a basketball dribbling task as personally relevant and instrumental were more intrinsically motivated, expended more effort and time on the task, and also displayed higher levels of objective performance than those in less self-determined conditions.

Summary

Research shows that situational motivation leads to several affective, cognitive, and behavioral outcomes. Furthermore, higher levels of self-determined motivation result in more positive situational outcomes, whereas lower levels of self-determined motivation result in less positive situational outcomes (Corollary 5.1). Although additional research is needed, especially with respect to cognitive outcomes, extant findings on consequences at the situational level provide support for the HMIEM as well as SDT.

RESEARCH ON MOTIVATION AT THE CONTEXTUAL LEVEL

Contextual motivation refers to one’s generalized motivation toward a specific life context. In the present section, studies on the determinants and consequences of contextual intrinsic and extrinsic motivation in sport and physical activity are reviewed.

Determinants

Several contextual factors have been found to influence athletes’ contextual motivation toward sport, including the coach, the motivational climate, scholarships, and the sport structures. This research is reviewed next.

The Coach

The coach represents one of the most important sources of influence on athletes’ motivation and quality of involvement in sport (Pensgaard & Roberts, 2002). Mageau and Vallierand (2003) have proposed a model that posits that coaches’ influence on their athletes’ motivation takes place mainly through the coaches’ interactional behavior with them. Such behavior can convey varying degrees of autonomy-support, structure, and involvement and caring toward the athletes, which are hypothesized to influence athletes’ perceptions of autonomy, competence, and relatedness. In turn, these perceptions facilitate athletes’ self-determined motivation. Of particular interest is the fact that Mageau and Vallierand have identified some of the determinants of coaches’ behavior toward athletes. These include their personal orientations toward coaching (i.e., a natural tendency to be controlling or autonomy-supportive), the context within which coaches work (e.g., a pressure cooker), and the perception coaches may have of their athletes’ behavior and motivation. This model is presented in Figure 3.2.

With respect to the effects of autonomy-supportive behavior on motivation, much research has shown that athletes who feel that their coaches are controlling tend to report lower levels of contextual intrinsic motivation and identified regulation and higher levels of amotivation and external regulation than those who feel that their coaches and instructors are autonomy-supportive (e.g., Amorose &
Horn, 2000, 2001; Hollembeak & Amorose, 2005; Pelletier, Fortier, Vallerand, & Brière, 2001; Pelletier et al., 1995; Reinboth, Duda, & Ntoumanis, 2004). Similar findings have been obtained in physical activity settings where a controlling teacher contributes to amotivation toward physical activity (Ntoumanis, Pensgaard, Martin, & Pipe, 2004), whereas autonomy support from important people in one’s life facilitates self-determined motivation toward exercise (Wilson & Rodgers, 2004).

To the best of my knowledge, only one study has looked at the role of the coach in athletes’ changes in motivation at the contextual level (Amorose & Horn, 2001). In this study, it was found that increases in Division 1 athletes’ intrinsic motivation over the season was predicted by their perceptions that their coaches provided high-level training and instruction behavior and low frequencies of autocratic (or controlling) behavior. These findings thus underscore the fact that controlling behavior from the coach will undermine athletes’ intrinsic motivation, whereas providing time and instruction is likely to facilitate its development.

Very little research has looked at the determinants of the coach’s autonomy-supportive versus controlling behavior in sport and physical activity. However, some research has started to assess some of these relationships in the field of education (see Mageau & Vallerand, 2003, for a more complete review). For instance, research by Pelletier, Séguin-Lévesque, and Legault (2002) has shown that teachers who experience a lot of pressure from the administration to teach in a specific way or to have their students perform at a high level (pressure from above) and who have unruly and/or amotivated students (pressure from below) end up using controlling behavior toward their students (see also Pelletier & Vallerand, 1996, on this issue). Furthermore, research reveals that teachers who have a personal disposition to be controlling rather than autonomy-supportive as assessed by the Problem in School Questionnaire display more controlling behavior toward their students, who in turn display lower levels of intrinsic motivation (see Deci, Schwartz, et al., 1981). In light of the importance of coaches’ behavior for their athletes’ motivation, it is important to conduct future research on the determinants and consequences of such behavior. The Mageau and Vallerand model represents an appropriate point of departure for such research.

**Motivational Climate**

Coaches may also influence their athletes indirectly through the type of motivational climate they help to cre-
ate. The motivational climate refers to the general ambience that exists in a team or club and the message it conveys to athletes. There are two main types of motivational climate: task-involved (or mastery) and ego-involved (or performance; see Duda & Hall, 2001). A task-oriented climate encourages participants to perform an activity in order to improve their skills; an ego-involved climate leads athletes to believe that they must outperform other athletes, including their teammates. Research reveals that a task climate is more conducive to the growth of self-determined forms of motivation (intrinsic motivation and identified regulation), whereas the opposite takes place with an ego-involved climate with respect to a variety of sports (Kavussanu & Roberts, 1996; Sarrazin, Vallerand, Guillet, Pelletier, & Curry, 2002) and physical activity (Brunel, 1999; Ferrer-Caja & Weiss, 2000; Kowal & Fortier, 2000; Ntoumanis, 2001a; Standage, Duda, & Ntoumanis, 2003).

### Scholarships and Sport Structures

Scholarships qualify as a contextual factor because they represent a type of reward that will remain present for the duration of the athlete’s collegiate career. The purpose of scholarships is typically to provide athletes with more time for training and studying. Unfortunately, scholarship recipients may come to feel that they play more to justify the scholarship they have received than for the pleasure of the sport. Scholarships qualify as a contextual factor because they represent a type of reward that will remain present for the duration of the athlete’s collegiate career. The purpose of scholarships is typically to provide athletes with more time for training and studying. Unfortunately, scholarship recipients may come to feel that they play more to justify the scholarship they have received than for the pleasure of the game. As a result, they may feel controlled (feel that they must perform) and become less intrinsically motivated. Early research provided support for this hypothesis (E. D. Ryan, 1977; Wagner, Lounsbury, & Fitzgerald, 1989), although E. D. Ryan (1980) subsequently found that the negative effects were only true for football players and not for male wrestlers and female athletes from a variety of sports. More recently, using the Intrinsic Motivation Inventory (IMI; McAuley, Duncan, & Tammen, 1989), Amorose and Horn (2000) found that scholarship athletes felt more competent and less pressured than nonscholarship athletes (which is not surprising, as they’re supposed to be better!), although in a subsequent study (Amorose & Horn, 2001), they didn’t find any differences. Because the IMI displays some conceptual problems (see Vallerand & Fortier, 1998), future research using other scales such as the SMS is needed to more clearly determine the motivational effect of scholarships.

Another contextual factor of interest pertains to the sport structures. These refer to the organizational pattern that is inherent in athletic leagues. For instance, certain leagues may foster competitive structures, whereas others may instill a more relaxed climate where self-improvement is the goal. Sport structures are important because they convey an implicit message that may affect athletes’ motivational processes. If the message conveyed to athletes is that winning is the only thing, then athletes will probably experience lower levels of intrinsic motivation and have less fun. However, if structures lead athletes to predominantly focus on self-improvement, they are likely to experience higher levels of intrinsic and identified regulation, and consequently more enjoyment. Research supports this hypothesis (Fortier, Vallerand, Brière, & Provencher, 1995; Frederick, Morrison, & Manning, 1996).

### Mediation Evidence

Several studies have now provided support for mediational effects at the contextual level (Hollebeak & Amorose, 2005; Ntoumanis, 2001a, in press; Reinboth et al., 2004; Sarrazin et al., 2002), both in sports and in physical activity settings. Perhaps one of the most impressive studies is that of Ntoumanis (2001b), who attempted to link specific social factors (cooperative learning, emphasis on improvement, and perceived choice) prevalent in British physical education classes to physical education students’ perceptions of autonomy, competence, and relatedness, and in turn to their contextual motivation toward exercise. Results from a path analysis revealed that a classroom in which emphasis was on improvement led to perceptions of competence, whereas cooperative learning and perceived choice led, respectively, to perceptions of relatedness and autonomy. In addition, although all three mediators were related as hypothesized to the different types of motivation, the most important predictor was perceived competence. This is in line with past research in sports (see Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003; Vallerand & Reid, 1984) but not in education, where perceived autonomy has been found to have the most important mediating effects (e.g., Vallerand, Fortier, et al., 1997). Future research is needed on the relative mediating impact of the three needs as a function of life contexts.

A final type of motivational determinant comes from the top-down effect (Corollary 3.3), where an individual who has a predisposition to do things out of intrinsic motivation (e.g., a high level of global intrinsic motivation) should display high levels of intrinsic motivation toward, for instance, basketball in general (e.g., a high level of contextual intrinsic motivation). Research using longitudinal and prospective designs has found support for the top-down effect with respect to the contexts of education (Guay et al., 2003) and physical activity (Vallerand, Guay, Mageau, Blanchard, &
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Cadorette, 2005, Study 3) over extended periods of time up to 5 years, and with a variety of participants, including some from the general population.

Noteworthy is that researchers have started to look at the role of personality variables, other than global motivation, and how these predict contextual motivation. For instance, Ingledew, Markland, and Sheppard (2003) related the personality dimensions of the Big 5 (Costa & McRae, 1992) to contextual motivation toward exercise using the BREQ. It was found that contextual intrinsic motivation was predicted by extraversion and conscientiousness; identified regulation by extraversion; introjected regulation by neuroticism; and external regulation by less conscientiousness and less openness to experience (amotivation was not assessed). Other researchers (Miquelon, Vallérand, Grouzet, & Cardinal, 2005) have shown that adaptive forms of perfectionism (Hewitt & Flett, 2002) are conducive to self-determined forms of motivation toward education, whereas maladaptive perfectionism leads to non-self-determined motivation. Overall, these two sets of findings are important because they suggest that motivation at the contextual level may be influenced to some extent by personality variables other than global motivation. Future research is needed to pursue these initial efforts.

Summary

Studies reviewed in this section indicate that contextual self-determined motivation toward sport is influenced by several social factors: such as coaches’ behavior, sport structures, scholarships, and the team’s climate (or fitness center ambience). Furthermore, the relationships between those social factors and contextual self-determined motivation toward sport or exercise are mediated by individuals’ general sense of competence, autonomy, and relatedness toward sport or exercise. Finally, global motivation and other personality variables have been found to predict contextual motivation.

Consequences

Several types of motivational outcomes have been studied at the contextual level. Next, we review empirical research on the affective, cognitive, and behavioral outcomes.

Affective Outcomes

Much research in sport has been designed to examine the positive relationship between contextual intrinsic motivation and affective consequences such as satisfaction, interest, and enjoyment (e.g., Brière et al., 1995; Pelletier et al., 1995) and the negative relationship with burnout (Raedeke, 1997). More recent research (Cresswell & Ekland, 2005) has extended such work by showing, in line with Corollary 5.1, the presence of the hypothesized continuum where intrinsic motivation (especially intrinsic motivation toward stimulation and intrinsic motivation toward accomplishment) was negatively associated with burnout and amotivation was strongly and positively associated with it. Along the same lines, Lemyre, Treasure, and Roberts (in press), showed that decreases in the self-determined motivation of top Division I swimmers over the course of the season predicted increases in burnout at season’s end.

Similar findings have been obtained in physical activity settings with other types of affective outcomes. For instance, a study by Ntoumanis (2001a) has shown that boredom in physical education classes was negatively predicted by intrinsic motivation but positively by amotivation and external regulation. Using the BREQ, Karageorghis and Vlachopoulos (2002) have also shown that contextual introjected regulation toward exercise predicted exercise dependence. Finally, Wilson and Rodgers (2002) found that identified regulation and intrinsic motivation contributed to physical self-esteem but that external and introjected regulation did not.

Cognitive Outcomes

Optimal concentration may represent one of the most important predictors of performance. In line with Corollary 5.1 of the hierarchical model, research with athletes from a variety of sports (Brière et al., 1995; Pelletier et al., 1995) as well as with physical education students (Ntoumanis, 2001a) and adult exercisers (Vallerand et al., 2005, Study 3) has shown that the highest levels of concentration result from the self-determined forms of motivation. Wilson, Rodgers, Hall, and Gammage (2003) have also shown that not only the level of concentration but also its quality is affected by motivation. Specifically, adults who mainly exercise out of non-self-determined motivation display an imagery style much more oriented toward the image they project to others than those who engage in exercise out of self-determined motivation. Such an imagery style is far from ideal when performing a demanding task.

In sum, the proposed link between the various forms of motivation and cognitive outcomes has been obtained with various populations in both sport and physical activity settings. However, there is a need to look at other types of cognitive outcomes (learning, memory, recall of broken plays, etc.) to more fully probe the relationship between motivation and cognitive outcomes. For instance, higher
levels of contextual self-determined motivation should lead top-level athletes to be more proactive and secure (Hodgins & Knee, 2002), thereby leading them to recall more errors they may have committed in game situations, and eventually to work on these mistakes and thus improve.

**Behavioral Outcomes**

Increased attention has been given to the role of contextual motivation in behavioral types of outcomes such as intentions to pursue engagement in sport or physical activity. Such research provides support for the adaptive role of self-determined motivation in both sports (Chatzisarantis et al., 2003; Sarrazin et al., 2002), and exercise (Ingledew, Markland, & Medley, 1998; Ntoumanis, 2001a; Thøgersen-Ntoumani & Ntoumanis, in press; Wilson & Rodgers, 2004; Wilson, Rodgers, Fraser, & Murray, 2004). Of particular interest is the research of Ferrer-Caja and Weiss (2000) showing that intrinsic motivation positively predicts effort and persistence as assessed by the physical education teacher. It thus appears that more objective forms of outcomes assessment (such as teacher reports) yield findings similar to those obtained with participants’ own reports (Fortier & Grenier, 1999; Li, 1999), thereby providing further validity to research in this area.

Results from this research reveal that, typically, the more self-determined the motivation, the more one intends to continue engagement in the activity. However, a major difference seems to emerge between the exercise and the sport studies. Specifically, although all studies reveal the presence of the hypothesized continuum, there is a difference with the main positive predictor of intentions. The results of a meta-analysis conducted mainly with sport studies (Chatzisarantis et al., 2003) reveal that intrinsic motivation is the main predictor. On the other hand, in exercise studies, identified regulation appears to be the main predictor (see Wilson & Rodgers, in press). One possible explanation for this discrepancy proposed by Vallerand (1997) deals with the nature of the activity. When the task is perceived as interesting, as in most sports, intrinsic motivation should lead to the most positive outcomes, as intrinsic motivation is then the optimal type of motivation. However, when the task is uninteresting, as is often the case with exercise, at least in the initial stages, then identified regulation may become a more important determinant of positive consequences than intrinsic motivation. Indeed, if a task is relatively dull and unappealing, intrinsic motivation may be insufficient to engage in it. Rather, what is needed is a motivational force leading the person to choose to engage in the activity despite the fact that it is not interesting. Identified regulation can provide such a force. This hypothesis makes sense and is in line with data from various studies, but additional research is needed to empirically test this hypothesis using a controlled design within the confines of the same study.

Research has also looked at the role of contextual motivation in persisting in sport. In a longitudinal study of over 22 months with Canadian teen swimmers, Pelletier et al. (2001) found support for the presence of a continuum, with the most important positive predictor of persistence being intrinsic motivation and the most important negative predictor being amotivation. Similar findings have been obtained in a study with French handball players over 21 months (Sarrazin et al., 2002) and with adult exercisers (Fortier & Grenier, 1999; Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). Of additional interest is the fact that Pelletier et al. found that the relationships between motivation at Time 1 and persistence changed over time. Specifically, although the link to external regulation was not significant at 10 months, it became significant and negative at 22 months. Conversely, the link between introjection and behavior, which was slightly positive initially, became null at 22 months. These findings suggest that the negative effects of external and introjected regulation may take place further down the road, perhaps when it is clear that the extrinsic payoffs (e.g., awards, fame) are no longer forthcoming. Future research on this issue appears important.

More recently, researchers have started to focus on specific types of motivations to better understand the intricacies of continued behavioral engagement in exercise. For instance, Hein et al. (2004) looked at the predictive role of the three types of intrinsic motivation with respect to British teenagers’ intentions to engage in sport and exercise after high school. The results revealed that intrinsic motivation to experience stimulation was the best predictor, followed by intrinsic motivation to accomplish things. The contribution of intrinsic motivation to know was not significant. The two predictors accounted for a total of 65% of the variance in intentions to exercise. These findings are in line with those of Jackson, Kimiecik, Ford, and Marsh (1998), who found that the best predictor of flow was intrinsic motivation to experience stimulation. It is thus possible that the pleasant experience of stimulation is what people seek from their exercise participation, and not necessarily the pleasure to learn or accomplish something. These results would seem to have some applied importance.

Other research (Vallerand & Losier, 1994) has shown that, over the course of a hockey season, a self-determined motivational profile led to an increase in the tendency to
show respect and concern for others (a positive sportspersonship orientation; see Vallerand, Brière, et al., 1997; Vallerand, Deshaies, Cuerrier, Brière, & Pelletier, 1996). Athletes who are self-determined toward their sport focus on the activity itself and not the end result. Winning is not a matter of life or death for them. Rather, respect and concern for the rules and participants is more important because it ensures the creation of a pleasant environment for all participants. The Vallerand and Losier findings have been replicated with physical education students over a 1-year period (Chantal & Bernache-Assollant, 2003). Subsequent research by Chantal, Robin, Vernat, and Bernache-Assollant (2005) extended these findings by distinguishing between reactive (wanting to hurt someone) and instrumental (displaying energy toward the game and not the opponent) aggression and showing that self-determined motivation toward sport facilitates sportspersonship orientations, which in turn leads to instrumental but not reactive aggression.

A final motivational outcome of interest is performance. Because self-determined forms of contextual motivation have been found to facilitate persistence at a specific activity, given equal ability and coaching, additional practice should lead to increased performance. There is a lot of evidence to support the role of self-determined motivation in performance on nonsport tasks (see Vallerand, 1997, for a review). Limited evidence exists for this hypothesis in sport and physical activity, where it has been found that inducing intrinsic motivation was conducive to better performance in putting (Beauchamp, Halliwell, Fournier, & Koestner, 1996) as well as swimming (Pelletier, Vallerand, Brière, & Blais, 2006). However, because neither study contained a true experimental design, alternative hypotheses exist.

Summary

The studies reviewed in this section provide strong support for the hierarchical model, with respect to the determinants and outcomes associated with contextual self-determined forms of motivation. However, future research using prospective, longitudinal, and experimental designs is necessary to more fully document the role of motivation in long-term outcomes, especially performance.

RESEARCH ON MOTIVATION AT THE GLOBAL LEVEL

Very little research has focused on motivation and determinants and consequences at the global level. However, as we see below, the available research underscores the importance of such research.

Determinants

No research appears to have examined how global social factors may affect global motivation. However, research by Vallerand and O’Connor (1991) with elderly individuals has revealed that the type of residence they live in seems to impact their global motivation. Elderly people living in residences that provided autonomy support (as assessed by observers) reported higher levels of contextual self-determined motivation toward most aspects of their lives (across six life contexts) compared to those living in controlling residences. Thus, although Vallerand and O’Connor did not measure global motivation per se, it does appear that spending most of one’s life in a controlling or autonomy-supportive residence may represent a global social factor likely to influence global motivation. Similar research could be conducted on the impact on global motivation of living in sports boarding schools (see Riordan, 1977).

Another global factor that would appear relevant for children is parents. Indeed, parents are a constant presence in all aspects of their children’s life. They are thus in a prime position to influence the development of their personality (Eccles & Wigfield, 2002), including global motivation. Assor, Roth, and Deci (2004) have conducted very informative research that partly addresses this issue. In two studies, these authors found that children who perceived their parents to be providing conditional regard (a form of control where love is provided conditionally to children upon certain behaviors on their part) display high levels of introjection uniformly across four life contexts (e.g., prosocial behavior, sports). The picture was partly supportive with identified regulation, where parental conditional regard was negatively correlated with identified regulation in some contexts (i.e., emotional control and academic domains) but not in the other two. It is hypothesized that if parental behavior can affect individual functioning and motivation in four life contexts largely in the same direction, global motivation is likely to be affected as well. Future research is needed to test this hypothesis.

Consequences

There are at least three ways through which global motivation can affect outcomes. A first influence comes from the influence of global motivation on global psychological adjustment. Because global self-determined motivation
reflects a proactive way of interacting with one’s environment, it would be predicted that having such a motivation should lead to better adaptive functioning and psychological adjustment. Empirical support exists for this hypothesis. For instance, Ratelle, Vallerand, Chantal, and Provencer (2004) showed that global self-determined motivation positively predicted increases in psychological adjustment that took place over a 1-year period with adults from the general population. Because experiencing positive psychological adjustment at the global level may provide additional strength to face demanding situations and failure experiences in sport, this first function of global motivation deserves attention in sport and physical activity.

A second way through which global motivation has been found to affect functioning is the protective function it may serve. A recent study by Pelletier et al. (2004) has shown that global motivation plays a protective function, leading women to perceive less pressure from society to have a thin body and to internalize to a lesser degree society’s stereotypes regarding thinness. Global self-determined motivation also had a direct negative effect on bulimic symptomatology. Because bulimic symptomatology does take place in sports, research on the protective function of global motivation with athletes is important.

Finally, global motivation can also serve an integrative function among life contexts. For instance, Koestner et al. (1992) have shown that adults with a predominant autonomy-causality orientation (the equivalent of a self-determined global motivation) display behavior that is more in line with their attitudes and inner values than individuals with a control (or non-self-determined) orientation. Similar findings have been obtained with children (Joussemet, Koestner, Lekes, & Houlfort, 2004). Thus, athletes with global self-determined motivation would be expected to have a sport-contextual motivation better integrated with other contextual motivations in their life. They would therefore be expected to experience fewer conflicts among life contexts and in turn to display a more focused involvement in sport and other life activities.

**Summary**

Very little research has been done at the global level with athletes or individuals engaged in physical activity. Future research with athletes could examine the role of parents and coaches in the development of global motivation and, in turn, how global motivation leads to different outcomes through the various functions it serves.

**RESEARCH ON INTEGRATIVE STUDIES**

Certain studies have looked at motivation and outcomes in a more integrated fashion either within the confines of an integrated sequence or by looking at how various motivations at two and three levels of generality are connected. Such research is reviewed in this section.

**A Social Factors → Psychological Mediators → Motivation → Consequences Sequence**

One of the key hypotheses of the HMIEM is that the impact of the environment on individuals takes place through a causal chain of processes which can be presented as follows: Social Factors → Psychological Mediators → Motivation → Consequences (see Vallerand, 1997; Vallerand & Losier, 1999). This sequence can take place at all three levels of the hierarchy. Following the lead of research on high school dropout (Vallerand & Bissonnette, 1992; Vallerand, Fortier, et al., 1997), some studies have provided support for this causal sequence with respect to sport dropouts at the contextual level (Pelletier et al., 2001; Sarrazin et al., 2002). For instance, in the Sarrazin et al. study, task- and ego-involving climates were found, respectively, to positively and negatively predict perceptions of competence, autonomy, and relatedness, which positively predicted self-determined motivation. In turn, self-determined motivation predicted intention to persist in handball, which led to actual persistence 21 months later. Pelletier et al. obtained similar results showing that coaches’ autonomy-supportive behavior influenced self-determined motivation, which prevented dropout in swimming over 22 months.

Research on the integrated causal sequence at the contextual level has also been tested in exercise settings. Such research reveals that different learning structures (Ntoumanis, 2001a), motivational climates (Ferrera-Caja & Weiss, 2000; Standage, Duda, et al., 2003), autonomy support from friends (Wilson & Rodgers, 2004), and the physical education teacher (Ntoumanis, in press) positively influence self-determined motivation through their impact on perceptions of competence, autonomy, and relatedness. Finally, self-determined motivation positively predicts a variety of contextual cognitive, affective, and behavioral outcomes, including teacher-rated assessment of behavior (Ferrera-Caja & Weiss, 2000; Ntoumanis, in press).

It appears that only one study has provided support for the proposed sequence at the situational level in sport. In this study with master swimmers (Kowal & Fortier, 2000), it was shown that motivational climates predicted perceptions of competence, autonomy, and relatedness, which in
turn led to self-determined situational motivation, which finally led to the experience of flow. Clearly, additional research is needed to test the validity of the integrated sequence in sports and physical activity settings at the situational level.

The results of these studies provide strong support for the proposed sequence in a variety of settings and activities. Future research is needed, however, with prospective or longitudinal designs at the contextual level, and experimental designs at the situational level, to provide more clarity regarding the direction of causality among the various variables of the causal sequence (see Grouzet, Vallerand, Thill, & Provencher, 2004, for such a test using an experimental design at the situational level with a cognitive task). There is also a need to look at other types of consequences, such as creativity and learning, as well as interpersonal outcomes such as quality of relationships and friendships.

Motivation at Two or Three Levels of Generality

A key aspect of the HMIEM is that motivation at a given level of generality reflects the relative influence of individual differences through the top-down effect and that of social factors. Brunel and Vallerand (2005) tested the relative influence of the top-down effect from contextual motivation and the impact of situational factors on situational motivation over time. These authors reasoned that when put in a new situation (practicing their sport on university premises with new coaches), athletes who usually practice in civic clubs should see their contextual motivation provide the main influence on their situational motivation toward practice because participants are not used to the social factors conveyed in such new settings. However, months later, when the meaning conveyed by situational factors is clearer, the latter should have a more potent influence on situational motivation than contextual motivation. Results of a study (Brunel & Vallerand, 2005) with French athletes provided support for the hypothesis.

Research has also started to look at how contextual motivation sets things in motion at the situational level so that affective outcomes can be experienced at that level. For instance, Amiot, Gaudreau, and Blanchard (2004) showed that self-determined contextual motivation toward sport led to the use of situational adaptive cognitive skills, which, in turn, facilitated reaching goals during a game. Finally, reaching one’s goals led to an increase of positive affect after the game. The opposite picture emerged for athletes with a non-self-determined motivation, as it led to the use of poor coping skills and failing to reach one’s goals and to experience less positive effect. Future research is needed to determine if the impact of contextual motivation on situational-level coping skills takes place through the top-down effect from contextual to situational motivation.

Another dimension of the HMIEM that has attracted attention is the bottom-up effect (Postulate 4). More specifically, motivation experienced at a lower level (e.g., the situational level) can produce over time a recursive effect on motivation at the next higher level (e.g., contextual motivation toward sport). Blanchard, Amiot, Saint-Laurent, Vallerand, and Provencher (2005) conducted a study to test this interplay between the contextual and situational levels leading to changes in contextual motivation toward basketball over time. Measures of contextual motivation toward basketball were obtained before the first and second games of the tournament and 10 days after the tournament. Moreover, measures of situational motivation (using the SIMS) were obtained immediately after the two games of a tournament. Finally, players’ assessment of personal and team performance as well as objective results of the games were collected to test the role of situational factors in the prediction of situational motivation. Results from a path analysis showed that contextual motivation for basketball predicted situational motivation during each of the two basketball games during the tournament (the top-down effect). Moreover, situational motivation for both basketball games was also predicted by team and personal performance (the situational factors). In turn, situational motivation influenced contextual motivation subsequent to each game, as well as 10 days after the tournament (the recursive bottom-up effect). In sum, Blanchard et al. tracked down the flow of psychological processes through which changes in motivation at the contextual level take place over time while providing support for several of the corollaries proposed by the HMIEM. Future research on Postulate 4, especially over the course of a whole season, would be fruitful.

Other studies have looked at the interplay between the motivations stemming from two life contexts and the outcomes that may be derived from such an interface. For instance, research has shown that conflicts between two life contexts, such as work and family for working adults (Senécal, Vallerand, & Guay, 2001) or education and leisure for students (Ratelle, Senécal, Vallerand, & Provencher, in press), lead to poor psychological adjustment. In exercise settings, Hagger and Chatzisarantis and their colleagues (e.g., Hagger, Chatzisarantis, Barkoukis, Wang, & Baranowski, in press; Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003) have shown that having a self-determined motivation toward physical activity at
school facilitates self-determined motivation toward physical activity during one’s leisure time. Future research is needed to pursue this line of scientific inquiry to determine when facilitative and conflicting motivational effects will be obtained between two life contexts and determine the types of outcomes that will be experienced by elite athletes and adult exercisers as a result.

Finally, to the best of my knowledge, only one study has integrated motivation at the three levels of the hierarchy in the context of sport and physical activity. In this study, Vallerand et al. (2005, Study 3) tested the interplay among motivations at the three levels of the hierarchy with participants in a fitness program. Results from a path analysis revealed that global motivation at the beginning of the fitness program influenced contextual motivation toward exercise 4 weeks later. In turn, contextual motivation toward exercise influenced situational motivation, which determined situational consequences of concentration and enjoyment while exercising.

Summary

Research in this section highlights the dynamic relationships that can take place between motivation at different levels of generality, as well as among different life contexts. Future research along these lines in sport and physical activity could provide not only a deeper understanding of the motivational processes at play, but also a better prediction of different outcomes experienced by athletes and physical activity participants.

INTERVENTION STRATEGIES

At least two major types of intervention have been conducted within the intrinsic/extrinsic motivation paradigm. One seeks to increase the autonomy-supportive behavior displayed by coaches toward the athletes. Based on the findings that an autonomy-supportive style is teachable (Reeve, 1998), Pelletier and his colleagues (2006) developed an intervention program to help swim coaches become more autonomy-supportive and consequently facilitate their athletes’ motivation. Results from this 18-month intervention program revealed that the program was highly effective in leading athletes to perceive their coach as less controlling and more autonomy-supportive and to experience higher levels of perceived competence and intrinsic motivation. Of major interest is the fact that attendance at practice increased markedly and dropout was reduced significantly. A recent intervention study with adult exercisers has shown similar results with respect to the important role of autonomy-supportive behavior in exercisers’ motivation (see Edmunds, Ntoumanis, & Duda, in press).

A second line of intervention studies takes into consideration the fact that some activities may not be inherently interesting and focuses on providing individuals with a rationale to engage in a specific behavior. However, how the rationale is presented is crucial. To be effective, the rationale must be presented in a noncontrolling way, while providing some form of choice and acknowledging the person’s feelings (Deci et al., 1994; Koestner et al., 1984). For instance, the fitness instructor may say something like “The reason we’re focusing on these exercises is because they’re the ones that will lead you to gain the most from your training (rationale).” Such instructions lead the person to “wanting to do what should be done” (Berg, Janoff-Bulman, & Cotter, 2001, p. .82). Research by Simons et al. (2003) in physical education settings has shown that similar instructions regarding rationale on a basketball task led to higher levels of intrinsic motivation, enjoyment, effort, time on task, and performance than conditions where students are told that they have to engage in the task simply because they will be tested on it.

In sum, advances have taken place recently with respect to interventions oriented at improving intrinsic motivation and self-determined motivation and creating positive consequences in athletes and exercisers. Future research is needed to determine if such interventions are applicable to a variety of tasks and situations, some interesting (e.g., playing games) and some less so (e.g., running suicide drills in practice; to this end, see Green-Demers, Pelletier, Stewart, & Gushue, 1998; Reeve, Jang, Hardre, & Omura, 2002).

CURRENT TRENDS AND FUTURE DIRECTIONS

Several trends have started to emerge in the literature. One pertains to the testing of different postulates and propositions of the HMIEM. Of these, the one that has received the most attention is the Social Factors → Psychological Mediators → Motivation → Consequences causal sequence. As presented earlier, much support has been garnered for this sequence, especially at the contextual level. Much research remains to be done with respect to a number of other aspects of the HMIEM, including the interplay of motivation at different levels of generality, the conflict versus facilitative effects of different contextual motivations on situational
motivation and outcomes, and the different functions of global motivation in athletes’ and exercisers’ contextual and situational motivations and ensuing outcomes. Future research on these issues would appear promising.

A second area where much action has taken place is the integration of different theories in leading to a better understanding of motivational processes. For instance, following the lead of Duda, Chi, Newton, Walling, and Catley (1995) and Brunel (1999), researchers have started to explore the relationships between elements of achievement goal theory (Nicholls, 1984) and those from SDT (Deci & Ryan, 2000; see also Ntoumanis, 2001b). Typically, researchers have looked at the motivational impact of different learning structures (Ntoumanis, 2001a) and motivational climates (Ferrer-Caja & Weiss, 2000; Kowal & Fortier, 2000; Standage, Duda, et al., 2003) and have shown that mastery (or learning, or task) climates and structures facilitate the satisfaction of participants’ needs for competence, autonomy, and relatedness, which in turn lead to self-determined motivation and adaptive outcomes. On the other hand, performance (or ego) climates have been found to trigger a maladaptive motivational sequence.

Another integrative attempt has been conducted by Hagger et al. (in press), who have integrated SDT, the theory of planned behavior, and the HMIEM to better understand how the constructs and processes of each model can better predict the generalization of physical activity from formal to informal settings (for a review, see Hagger & Chatzisarantis, in press). Basically, the transcontextual model posits that autonomy support from the physical education teacher facilitates self-determined motivation toward physical activity at school. Such motivation (especially intrinsic motivation and identified regulation) generalizes to leisure contextual motivation, which in turn influences attitude and perceived behavioral control toward exercise. Finally, attitude and control lead to the intention to exercise during leisure time, which leads to actual exercise behavior.

These two integrative efforts are important from both theoretical and applied standpoints. Clearly, such research must continue, as it can lead to theoretical advances with respect to a better understanding of the contribution and limits of each theory as well as a better prediction of outcomes promoted in sport and physical activity settings.

Another area of active interest has been the use of cluster analyses to look at how the different types of motivation can be best integrated in both sport and physical activity settings (Matsumoto & Takenaka, 2004; Ntoumanis, 2002; Vlachopoulos, Karageorghis, & Terry, 2000; Wang & Biddle, 2001; Wang, Chatzisarantis, Spray, & Biddle, 2002; Weiss & Amorose, 2005). Research so far reveals the presence of different numbers of clusters in different studies, presumably because of methodological differences. However, a constant across the various studies is the presence of a high-self determined motivation cluster and the positive outcomes associated with it. Future research is needed to systematically compare clusters within sports and physical activity settings and determine which ones are predictive of positive outcomes in each type of setting.

Two other issues deserve mention, as they represent important research agendas for the future. The first is the role of unconscious (or implicit) motivational processes. Much research in social cognition has now shown that behavior can be influenced by factors outside of our awareness (see Bargh, 2005). Along these lines, Lévesque and Pelletier (2003) showed that presenting primes dealing with intrinsic or extrinsic motivation out of awareness is sufficient to induce the situational motivation implied by the primes. In an even more provocative study, Hodgins, Yacko, and Gottlieb (2005, Study 3) showed that priming members of a university rowing team with self-determined words (e.g., “choose,” “freedom”) led to faster times on a rowing machine than priming members with non-self-determined (e.g., “must,” “should”) and amotivational (e.g., “passive,” “uncontrollable”) words. In other words, priming self-determined motivation outside of awareness increases performance! Finally, as described earlier in the Ratelle et al. (2005) study, it may not be necessary to use primes related to motivation to induce the actual motivation. Priming certain environmental cues associated with aspects of the activity (e.g., sounds) can trigger by their mere unnoticed presence certain types of contextual motivation, which, in turn, will subsequently influence situational motivation. For obvious theoretical and practical reasons, it is believed that sport psychologists would do well to start exploring the role of such unconscious motivational processes.

A final issue pertains to the effect of culture on motivational processes. The role of culture in human behavior has attracted a lot of attention lately (see Kitayama, Markus, & Kurokawa, 2000; Nisbett, 2003). Among other perspectives, it has been hypothesized that cultures that are more individualistic (e.g., Western society) promote the development of an independent self, whereas collectivistic cultures (e.g., East Asia) facilitate an interdependent self. This has led to some interesting motivation research by Iyengar and Lepper (1999), who have shown in two studies that Asian American children (with an interdependent self) displayed higher levels of situational intrinsic motivation on tasks that were chosen by their mothers than on those chosen by themselves,
whereas the opposite took place for Anglo-American children. These results are puzzling because much research has shown that variables related to autonomy and choice posited by SDT do operate in various cultures, including collectivistic ones (e.g., Chirkov, Ryan, Kim, & Kaplan, 2003). Because sport and physical activity are engaged in most, if not all, cultures, it is imperative to determine if culture affects motivation in sport and physical activity settings. And if so, what are the processes through which such effects take place? Sport psychology has typically neglected cultural issues (Duda & Hayashi, 1998). The time has come to move forward and to correct this important oversight.

**CONCLUSION**

The purpose of this chapter was to review the extant literature on intrinsic and extrinsic motivation in sport and physical activity using the HMIEM as an organizing framework. The present review has shown that such research is vibrant, as it deals with a variety of issues at different levels of generality. A number of future research directions have also been proposed. To this end, it is important to reiterate that the hierarchical model proposes that it is desirable to progress from the mere study of athletes (or exercise participants) to that of whole individuals who, in addition to being athletes (or exercise participants), are also students (or workers) and part of a social matrix (see Vallerand, 1997; Vallerand & Grouzet, 2001). Specifically, this means that if we are to better understand an individual’s motivation toward sport or exercise and ensuing outcomes, we need to know more about his or her motivations in other life contexts as well as his or her motivational orientation at the global level. Furthermore, we need to pay attention to factors that may operate out of the person’s level of awareness and those that may affect motivation differently as a function of culture. It is believed that future research framed in line with the HMIEM should lead to a more comprehensive understanding of the psychological processes underlying motivational phenomena taking place in sport and physical activity settings, eventually contributing to the development of a more adaptive environment for all participants.

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