

CHAPTER 19

Sport, Physical Activity, and Physical Education

Physical activity is one of the most important, and yet complex, domains of motivated behaviors. People are inherently active creatures and, accordingly, they are often intrinsically motivated for physical activities. This is especially reflected in *sports*, and thus we begin by discussing sports and intrinsic motivation, applying cognitive evaluation theory (CET). We review experiments testing the effects on intrinsic motivation of external events such as rewards, athletic scholarships, feedback, and competition. The orientations of coaches and important others also have significant impact on the need satisfaction and motivation of athletes at all levels, with need satisfaction mediating the relations of coaching climates to a variety of athlete and team outcomes. *Exercise* is another form of physical activity that tends to be less intrinsically motivated than sports. Accordingly, internalization is critical to exercise maintenance, and need support from the interpersonal context is very important for promoting long-term exercise. Individual differences also matter; for instance, people who are high on the autonomous causality orientation are more motivated to exercise regularly than those low in autonomy, as are people with strong intrinsic relative to extrinsic aspirations. Finally, research in *physical education* classes shows that need support from instructors, as well as need satisfaction and autonomous motivation of students, leads to more positive physical activity outcomes.

From the time of birth, humans are, by their very nature, active, playful, and challenge-seeking organisms. They look, touch, throw, manipulate, and explore. Indeed, across the globe, anywhere that children are raised in humane conditions, active, vigorous play is a substantial part of their lives. Through self-initiated physical activity, children acquire many of the foundational competencies that allow them to adapt effectively to life: capacities not only for motor coordination and physical efficacy, but also for mental manipulation, problem solving, social interactions, and creativity. Active play is essential to healthy physical and psychological development in children, and it continues to have an important role in health and vitality throughout their lives. This is no doubt why we evolved to find it intrinsically motivating.

Our active human nature would clearly confound anyone thinking that organisms primarily seek quiescence or arousal reduction. People freely put enormous energy and effort into “leisure” activities, often in contrast to other externally rewarded life domains through which they may have to drag themselves, perhaps on a regular “nine-to-five” basis. A seemingly unmotivated woman who has difficulty finding energy for her well-compensated desk job may, for no pay at all, enthusiastically practice tennis after work. A teenager whom teachers or parents see as lazy because he doesn’t like homework may persist for hours practicing his basketball jump shot. What makes such effortful activity so intriguing is precisely that it is very strongly motivated in the apparent absence of tangible rewards or external prods. In fact, sport and outdoor recreation activities are most often intrinsically motivated, supported by the inherent psychological satisfactions and vitality they yield (Frederick & Ryan, 1993; Ryan & Deci, 2007).

Of course, not all physical activities done during leisure time are intrinsically motivated. For example, whereas people usually say they are *playing* a sport, they use the term *workout* to describe vigorous exercise, reflecting that for many this may not be the most enjoyable part of their day. Yet people may nonetheless persist at such activities, perceiving them as instrumental to intrinsic (e.g., health) or extrinsic (e.g., looking attractive) goals (e.g., see Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). Other activities are done because disciplined practice and arduous training can be instrumental to enhancing sports performance. This, then, leads to the issues of when and how varied motives, whether intrinsic or extrinsic, predict persistence, performance, and vitality in physical activities.

In this chapter, we explore the motivational dynamics of sports and other physical activities, examining their intrinsic satisfactions and their potential to enhance physical and mental vitality. We highlight, however, that both sport and exercise behaviors can vary in their relative autonomy, affecting the quality of experience associated with them and long-term persistence. They can also differ in their intrinsic versus extrinsic goal focus. Yet because of their somewhat different motivational bases, we first consider motivational issues as they apply to *sports*, and subsequently we separately consider research on motivation for *exercise* and in *physical education* contexts.

Motivational Processes in Sports

Sports are a source of enormous interest and enjoyment, and for many individuals they also represent a health-promoting factor in their lives. People spend a great deal of time playing sports and watching sports. Sports are among the most popular topics in casual conversations, and incredible amounts of money and resources are spent on sports at all levels. Understanding the motivational dynamics of sports is thus no trivial matter.

Many people, both young and old, spend free time playing sports, from casual pickup games to more organized settings such as youth or amateur club leagues. This use of their natural “free choice periods” toward effortful activities suggests a high degree of intrinsic motivation. In fact, early investigations of sport motivation converged in showing that intrinsic motivation plays an especially significant role in sports. A study of physical activities in adults by Frederick and Ryan (1993) confirmed that people’s engagement in sports is typically intrinsically motivated, whereas their motivation for exercise or fitness was likely to have a heavier extrinsic basis. Research on youth participation in sports (e.g., Gill, Gross, & Huddleston, 1983; Gould, Feltz, & Weiss, 1985) similarly showed that participation in sports is largely fueled by intrinsic motives such as fun, challenge,

and learning. Exemplifying this, Raedeke (1997) found that adolescent swimmers who were intrinsically motivated reported lower burnout than swimmers driven by extrinsic reasons, suggesting that intrinsic motivation helps sustain involvement.

Although typically done for their inherent satisfactions, sports can, of course, be otherwise motivated. The more organized the sport settings, the more likely it is that they will generate the kinds of attention and investment from spectators, parents, and coaches that bring additional motivational dynamics into the picture. Thus, when people play for parents' or coaches' approval, for scholarships, for money, or for fame, this will change their relationship to sports in ways of interest to SDT. In addition, more advanced sport participation often requires nonintrinsically motivated activities, such as conditioning or drills, and how these extrinsic behaviors are motivated is also of interest. Accordingly, we address both intrinsic and extrinsic motivations in sports, beginning with the former.

Sporting Environments and Intrinsic Motivation

Because sports are, to an appreciable extent, intrinsically motivated, research done within the cognitive evaluation theory (CET) framework on social-contextual factors is directly relevant to sporting activities. For example, a variety of extrinsic factors, such as contingent rewards, negative feedback, competitive pressures, and controlling coaching climates, all intended to motivate athletes, are nonetheless factors that could potentially undermine sport motivation, participation, and enjoyment.

Rewards for Sports

The potential for awards and rewards to undermine intrinsic interest was first shown by Orlick and Mosher (1978). They pretested children ages 9–11 on a motor balancing task using a free-choice behavioral measure of intrinsic motivation (as described in Chapter 6). Then the children were placed in either a reward (trophy) or no-reward condition while they performed the task. Four days later, the children were given another opportunity to engage in the task, again using the free-choice assessment of intrinsic motivation. Those who had received the trophies showed a decrease in free-choice time spent on the task from the prereward to postreward sessions relative to those in the no-reward group. What such data indicate is that people are readily intrinsically motivated for even simple physical challenges and also that such intrinsic motivation can be readily undermined.

It bears noting again that, as we outlined in Chapter 6, offering trophies, prizes, or other rewards can either enhance or diminish intrinsic motivation for those who receive them, depending on factors such as the nature of the contingency and the manner in which they are delivered that influence the functional significance they foster. Further, whenever programs use rewards to recognize individuals, there are many athletes—even good athletes—who do not receive them and for whom the implicit message can be that they are not as good as the others, which is likely to diminish their ongoing motivation. The fact that so many youth drop out from sports is in part due to this functional significance; they have come to see themselves as lacking the competence to compete, often because of the salience of social comparisons.

Of course, one function of trophies and awards for many who use them is precisely that of selection or *gatekeeping*—that is, of separating the elite from the non-elite. Here the intention is not that of motivating all players but rather identifying and promoting the best athletes. This system has an important role in competitive elite athletics but may have unintended participation consequences in youth sports, where inclusiveness is an

aim. Using them with young athletes or athletes who have not come into their prime runs the risk that they never will.

Supporting this idea, Matosic and Cox (2014) looked at various coaching behaviors, including the controlling use of rewards. They found, as SDT expects, that the use of rewards to motivate was associated with lower intrinsic motivation in athletes and lower basic need satisfaction. Moreover, survey research (e.g., Gill et al., 1983) with amateur athletes suggests that such extrinsic rewards play little positive role in motivating their participation and improvement in sports.

Athletic Scholarships

Relevant to the basic reward experiments are studies that have examined the relations between *athletic scholarships* and intrinsic motivation for the sports. Ryan (1977, 1980) did early field studies based on CET examining the impact of receiving scholarships on intercollegiate sports participants' desires to play their sports after college. In the first, male scholarship athletes, primarily football players, listed more extrinsic reasons for sport participation and less enjoyment of the sport than did comparable nonscholarship athletes. In the subsequent study, the researcher also explored the potential for scholarships to have informational value and enhance intrinsic motivation. He reasoned that women receiving scholarships (which at that time was rare) would interpret them as signs of competence, and thus the scholarships could have an *informational* functional significance. However, he suggested that men could be expected to experience the scholarships as more controlling because scholarships were a standard way of "buying" male collegiate athletes such as football players. He found once again that males in the common scholarship sports, such as football, displayed undermining but that neither females in general nor males in sports in which scholarships were less frequent showed evidence of the undermining effect. Such data suggested that athletes who get athletic scholarships in settings in which they are somewhat common are likely to experience them as controlling and show decrements in intrinsic motivation, but if the scholarships are less common, they may be experienced as more informational, signifying competence.

Subsequently, Amorose and Horn (2000) looked into this effect in a sample consisting largely of Division I athletes in the United States who were receiving various levels of scholarships, from none to full. They found no differences between scholarship and nonscholarship athletes on the Interest/Enjoyment subscale of the Intrinsic Motivation Inventory (IMI; Ryan, Mims, & Koestner, 1983), and they also found that scholarship athletes had higher feelings of competence and lower levels of tension than nonscholarship athletes. The same study also showed that athletes with more autocratic or controlling coaches had lower intrinsic motivation.

Further investigating the scholarship issue, Medic, Mack, Wilson, and Starkes (2007) assessed both current and anticipated future motivation in a sample of basketball players. Like Ryan (1977, 1980), they reported somewhat complex results, again with some gender effects. Men with sport scholarships had higher external regulation than both men and women nonscholarship athletes and compared with women scholarship athletes. For nonscholarship athletes, the perceived possibility of obtaining full scholarships in the future predicted increased external regulation and decreased intrinsic motivation, whereas for scholarship athletes, the possibility of removing scholarships was associated with decreased intrinsic motivation. Such results show that financial rewards for sports can have varied effects on motivation, including sometimes that of diminishing

autonomous engagement, largely due to variations in their functional significance. However, further research is needed to sort out these effects and the circumstances in which scholarships will have controlling or informational significance.

Professional Sports

Few studies have examined the impact of rewards on motivation in professional contexts. However, using records from the National Basketball Association and Major League Baseball, White and Sheldon (2014) reported a provocative study on this issue. They followed players' careers in 3-year blocks that included a baseline year, a contract year, and a postcontract year. Their question was whether the salience of the players' monetary rewards highlighted during the contract year would influence their intrinsic motivation from pre- to postcontract year. The researchers found that performance in the third year was, in fact, poorer than during the first and second years, suggesting to them that the emphasis on rewards in the contract year led to a decrease in intrinsic motivation during the following year, which was lower even than baseline, as evidenced in indicators such as points scored, batting averages, and defensive performance. Understanding whether this was actually a decrease in intrinsic motivation, how general this effect would be across professional sport contexts, and what factors might potentially moderate it awaits further study.

Optimal Challenge, Feedback, and Competence

It is a basic tenet of CET that, in any context in which people experience some level of autonomy, positive feedback will likely enhance intrinsic motivation. This proposition must, however, be moderated by the concept of optimal challenge, which is essential for intrinsic motivation (Deci, 1975) and the experience of flow (Csikszentmihalyi, 1975). Optimal challenge allows people to successfully exercise and stretch their abilities, which they typically experience as enjoyable. Positive feedback is thus most motivating when it is received in an optimally challenging setting, one that requires individuals to exert themselves, do well, and feel competent but that is not so difficult that they don't have a reasonable chance of doing well. Sport and exercise activities, because they provide multiple sources of feedback, are prototypical arenas for experiencing this sense of optimal challenge so central to intrinsic motivation (Deci & Ryan, 1980a). Most sports provide varied levels of entry for any participant, from amateur pickup games to elite or professional competitions. Thus people can gravitate to their own level of optimal challenge.

The effects of feedback on intrinsic motivation were tested early on by a number of investigators. Vallerand and Reid (1984), for example, assessed the impact of positive and negative verbal feedback on participants using the stabilometer motor task. They confirmed predictions from CET that positive feedback would enhance, and negative feedback would diminish, intrinsic motivation for the task, relative to a no-feedback condition. Importantly, these investigators also assessed the participants' perceived competence for the task and found that perceived competence mediated the impact of feedback on intrinsic motivation. Weinberg and Jackson (1979) and Weinberg and Ragan (1979) found similar results in sports-related tasks, with both studies finding that positive feedback increased and negative feedback decreased intrinsic motivation. These studies represent further confirmation of the facilitating effect of positive verbal feedback concerning performance, such as the kind that coaches can provide.

As implied earlier, although providing positive feedback under most conditions except for controlling ones (e.g., Ryan, 1982) has positive effects on intrinsic motivation, people who end up getting negative feedback are likely to pay the cost of detriments to their motivation and engagement. Yet this is not inevitable. Again as CET suggests, it will depend on the functional significance of the feedback. When evaluative and controlling, it will undermine intrinsic motivation—yet when efficacy-relevant, it can enhance it.

This dynamic aspect of negative feedback was recently explored by Carpentier and Mageau (2013). They focused on what they called *change-oriented feedback*, in which constructive, effectance-relevant inputs are provided with an aim toward improvement. Based on surveys of both athletes and coaches following practice sessions, descriptive findings revealed that autonomy-supportive, change-oriented feedback is empathic, is accompanied by choices of solutions, is based on clear and attainable objectives known to athletes, avoids person-related statements, is paired with tips, and is given in a considerate tone of voice. The findings showed, more importantly, that such change-oriented feedback predicted more positive athletes' outcomes above and beyond coaches' other competence- and autonomy-supportive behaviors.

Similarly, Mouratidis, Lens, and Vansteenkiste (2010) found that when coaches gave negative feedback to their athletes in an autonomy-supportive way, the results were positive experiences and improved performance for the athletes. In other words, although negative feedback does tend to decrease people's feelings of competence and intrinsic motivation, it is possible to provide it in a way that is not so detrimental. This is an important finding, as negative feedback is very common not only in sports but in other domains of life as well. In essence, it requires reformulating negative feedback as an opportunity to support athletes', students', or employees' thinking about their own skills and about how to practice and perform more effectively. When so viewed, it provides an opportunity for growth and development rather than humiliation or despair.

Competence feedback, especially when provided in supportive rather than controlling or evaluative ways, is in fact a key element in sport motivation. One of the reasons that people in most cultures have structured their physical play into sport activities, from rugby to badminton, is that the structure of sports allows people to enhance their competencies in part by receiving meaningful competence feedback. Thus, although humans have always actively used their bodies, sport allows them to gauge improvement through the feedback provided by points, times, scores, wins, and other competitive outcomes, as well as well-crafted feedback from thoughtful coaches and instructors. Yet, as we shall shortly review, sometimes the competitive context of sports, with its inherent feedback, can undermine as well as enhance.

Ego Involvement in Sport

Thus far, much of our discussion of sport has focused on autonomous (in contrast to controlled) motivation. There is, however, another motivational concept that has been important in SDT and is highly relevant to sport, and that is *ego involvement*. We introduced the concept in Chapter 7, suggesting that it is an internal pressure resulting from people's feelings of self-worth being contingent upon outcomes, on meeting some standards or achieving some specific goals. We elaborated the concept in Chapter 8, suggesting that ego involvement is a form of introjected regulation in which people have partially internalized some value or regulation but have not fully accepted it as their own. The individuals are thus controlled by these internal contingencies in ways that are not

unlike being controlled by external contingencies, except that with ego involvement the process is largely within them. Early research (Ryan, 1982) showed that when people's self-esteem was linked to proving themselves worthy—for example, doing well at a target activity that proves they are intelligent—they lost intrinsic motivation for that target activity. This suggests that ego involvement is a form of internally controlling regulation that can be detrimental to people's autonomy and sense of self.

The competitive nature of sports, along with the use of contingencies and pressures for approval, recognition, or rewards, are very likely to potentiate ego involvement in sport activities. For example, we've all seen instances of angry, aggressive, inexcusable responses to losing competitions, suggesting that the athletes' sense of worth was riding on the win. That is, these athletes may have become ego involved in competition, feeling inner pressure to win in order to feel good about themselves. Although, as we shall subsequently review, competition can be simply informational, when external pressures and contingent regard are salient, individual athletes can easily introject the standard of needing to win or to achieve specific performance outcomes in order to feel worthy. When people are ego involved and outcomes are attained, people will typically feel dominant and prideful; but when outcomes are uncertain or negative, guilt, shame, anxiety, and aggression are common experiences (Deci & Ryan, 1985b). Ego involvement is thus a motivating state; indeed, it is often very powerfully motivating, as people's self-esteem is on the line. But research has shown that there are costs, such as low need satisfaction and high negative affect, to this type of motivation (Standage, Duda, & Pensgaard, 2005).

Various studies have provided further support for these ideas. For example, Lonsdale and Hodge (2011) found that elite athletes from New Zealand who participated in their sport with a strong introjected or ego involved form of regulation were more likely to experience burnout over a 4-month period than were those with other strong regulatory styles. Sarrazin, Vallerand, Guillet, Pelletier, and Cury (2002), in a 21-month longitudinal study of adolescent handball players, found that, when there was a general coaching climate of ego involvement, the athletes reported low levels of autonomy, which were eventually detrimental to their participation in the sport. Duda and colleagues performed a series of studies related to ego involvement in sport. First, Duda (1989) found that high school students in organized sports were higher in ego involvement than those in recreational sports. Duda, Chi, Newton, Walling, and Catley (1995) later found that participants who showed greater ego involvement were less intrinsically motivated for the target activity. Seifriz, Duda, and Chi (1992) similarly found that high school basketball players who were high in dispositional ego involvement were low in intrinsic motivation.

Ego involvement and other forms of introjection are often accompanied by *self-talk* in which, for example, people may be telling themselves what to do and perhaps even threatening themselves with sanctions if they don't. However, research by Oliver, Markland, and Hardy (2010) showed that not all self-talk is necessarily controlled or ego involved. They distinguished between self-talk that is informational and typically accompanies autonomous motivation and self-talk that is controlling and accompanies forms of controlled motivation. The informational self-talk was found to be associated with positive affect, regardless of whether the person did well or poorly on the target activity, whereas controlling self-talk, which accompanies ego involvement, was found to be associated with anxiety and negative affect, especially if the person did poorly on that activity. Thus, similar to what Carpentier and Mageau (2013) suggested about coach-provided change-oriented feedback, Oliver et al. showed that people's self-coaching can involve similar dynamics.

Competition: Direct and Indirect

Sports are unique as instances of intrinsically motivated behaviors because competition is integral to many. Indeed, many people consider competition as virtually definitional for sport, and it is not unusual to hear athletes say that competition is what makes sports fun. Because competition itself has interesting motivational dynamics, we turn to a discussion of research on the impact of competition on intrinsic motivation for sport.

Ross and Van den Haag (1957) provided a classic distinction concerning competition that has informed literature since (e.g., Alderman, 1974). The term *direct competition* was defined as players struggling against one another to maximize their own success. For example, two basketball teams facing off against each other are each trying to win both by scoring points for their team and by interfering with the other teams' attempts to score; the teams would be engaged in direct competition. There is another case of competition that would also be considered direct competition, and that involves each individual or team trying to maximize success and thus beat another individual or team without the opportunity to interfere with the other team's performance, as, for example, in most track and field events or winter sports. Thibaut and Kelley (1959) added that "perfect" competition is represented by "zero-sum" situations in which the gains or wins of one side represent losses for the other. These researchers found that competition so defined tended to lead to mistrust, deceit, and aggression.

Indirect competition, in contrast, involves athletes competing against themselves in the sense of trying to perform better than they have done previously. Indirect competition is central to skill building and performance in sports and is reflected in athletes' adoption of mastery goals, which are typically, though not always, positively related to intrinsically motivated engagement (e.g., Benita, Roth, & Deci, 2014). Nonetheless, our discussion of competition focuses primarily on direct competition.

According to CET, direct competition, like so many other external events, can have both *informational* and *controlling* aspects (see Chapters 6 and 7). The informational aspect is linked to the idea that competitive environments can offer optimal challenges and competence feedback. Part of the joy in competition stems from the feedback, both immediate and in terms of scores, that one can get from performing against opponents who are also trying to do their best. On the other hand, competition can often have controlling aspects, as when a player feels that he or she "has to" win. This pressure can come from others (parents, coaches, teammates) or can result from ego involvement (Standage & Ryan, 2012). The more controlling the context, the more the game becomes only instrumental to an outcome (winning), changing one's relation to the activity. Thus competitive settings in which there is pressure to win would be expected to undermine intrinsic motivation, whereas competitive settings in which the focus is on task involvement and mastery should generally maintain or even enhance intrinsic motivation. As such, direct competition can potentially make a task either more fun or more painful as a result of these motivational dynamics.

Competition and Intrinsic Motivation

Deci, Betley, Kahle, Abrams, and Porac (1981) reported the first study examining whether competition would tend to be informational or controlling and thus would leave intrinsic motivation enhanced, undermined, or unchanged. Comparing direct competition to indirect competition, they had people complete spatial-relations puzzles as quickly as they could in an attempt either to improve their own performances (i.e., indirect competition)

or to beat the other participant and win the “game” (i.e., direct competition). In both direct and indirect conditions, the target participant was allowed to solve the puzzles faster than the other player in the room, who was an experimental accomplice. Participants in the direct-competition condition, despite winning, were subsequently less intrinsically motivated for the activity than were those in the more likely mastery-motivated, indirect-competition condition.

Winning, Losing, and Pressure in Competitions

In the Deci, Betley, et al. (1981) study, the participants in the direct competition won and the participants in the indirect competition performed better than the other participant (i.e., the accomplice). What might have happened if the participants had lost or done poorly? Studies have found what is perhaps obvious to all competitors: Losing a direct competition leads to less intrinsic motivation than winning (McAuley, Duncan, & Tammen, 1989; Reeve, Olson, & Cole, 1985).

Another aspect of the Deci, Betley, et al. (1981) study was that the experimental manipulation made clear that the goal was to win, to *beat* the opponent. This raised the question of what would happen to participants’ intrinsic motivation if there were a direct competition without this emphasis on winning per se. Reeve and Deci (1996) did a study of winning a competition when participants were under pressure to win compared to winning when there was no controlling pressure applied. They compared each of those two conditions to conditions of no-competition–no-feedback and of losing the competition in a nonpressuring context. Findings showed that those who won the competition (without pressure) had the highest level of intrinsic motivation, with a mean higher than that of the participants in the no-competition–no-feedback comparison group. Further, those who won in the nonpressuring context were significantly more intrinsically motivated than either those who won in the pressuring condition or those who lost the competition. First, this indicates that winning a direct competition can be positively motivating as long as the pressure to win is not what is most salient. Second, winning versus losing does make a big difference, because it conveys important information about the athletes’ competence. In sum, the downsides of competition are that both the pressure to win and the losing tend to be detrimental. The upsides involve the rich competence feedback that competitive situations can entail. Finally, it is worth noting that all the effects that emerged from the Reeve and Deci study were mediated by the participants’ perceptions of competence and autonomy, as SDT would predict.

Can We Ameliorate the Effects of Losing?

Losing can clearly have negative effects on intrinsic motivation, largely through diminishing feelings of competence. Vansteenkiste and Deci (2003) took interest in whether there were conditions in which, even while losing, one might feel some competence and thus maintain intrinsic motivation.

To do this, Vansteenkiste and Deci (2003) had participants compete for monetary rewards under varied conditions. The first three conditions were (1) a no-competition comparison group, (2) a win-the-reward group, and (3) a lose-the-reward group. As expected, when it came to intrinsic motivation, the win group was the highest and the lose group was very low, with a significant difference between these two conditions. Yet the more interesting part of the experiment concerns two other conditions. In both, participants lost the competition and the competitively contingent reward. Yet in one,

the participants got positive feedback for doing well, even though they lost and got no reward; in the other, participants received a monetary reward for doing well even though they lost, so they lost the competitively contingent reward but received the performance-contingent reward, thus receiving the same amount of money as the group that won the competition and reward. Results revealed that when the losers received positive competence feedback, their intrinsic motivation was significantly higher than that of losers who did not get positive feedback. That is, the positive feedback had ameliorated the negative effects of losing. Finally, when losers got the performance-contingent reward for doing well, the reward had no ameliorative effect, even though the reward presumably conveyed positive feedback. Here we see that informational elements can ameliorate the effects of losing, whereas events potentially seen as controlling are less effective.

To summarize the research on competition and intrinsic motivation, competition can be either informational or controlling. When people compete and win, the winning can have an informational functional significance and enhance intrinsic motivation. However, when people win a competition in which there is pressure to win or in which there is a competitively contingent monetary reward, these pressures counteract the implicit positive feedback of winning and have an overall negative effect on intrinsic motivation. Further, when people lose a competition, their intrinsic motivation often suffers, but if there is positive feedback about things they did well in the activity, it can ameliorate the undermining effects of losing. Thus the problem with direct competition is the pressure that so often surrounds it, sometimes with great intensity, as if winning a competition were the most important thing in the world. It seems that environments that truly support the adage “it’s not winning or losing, but how you play the game” are those most likely to support athletes’ intrinsic motivation.

All of this research has especially important implications for youth sports, where coaches and parents may, in their zeal to see their athletes win, unwittingly undermine the participants’ long-term motivation to play by bringing pressure to bear on the youth. The research also suggests that many factors beyond just competition itself can affect people’s intrinsic motivation for sports because of their informational versus controlling functional significance.

Inner Experiences, Intrinsic Motivation, and Outcomes

We have now reviewed research showing that various external events such as rewards, feedback, and competition can affect intrinsic motivation for sporting activities, and we have interpreted the results in terms of these events affecting participants’ experiences of autonomy and/or competence satisfactions. Some studies on the antecedents of intrinsic motivation for sports and related activities have more directly assessed participants’ perceived autonomy and perceived competence or, more broadly, their experiences of autonomy, competence, and relatedness need satisfactions while doing an activity. They have then used those need-satisfaction-versus-frustration experiences to predict intrinsic motivation or related positive outcomes. For example, Smith, Ntoumanis, Duda, and Vansteenkiste (2011) found that when athletes reported autonomy for pursuing a goal at the beginning of a season, they displayed more midseason effort expenditure, which subsequently predicted their end-of-season goal attainment. Sebire, Jago, Fox, Edwards, and Thompson (2013) found that satisfactions of children’s autonomy, competence, and relatedness needs were related to the children’s intrinsic motivation for sport-related activities, which was associated with the children’s objectively assessed physical activity. As well, in a study of Spanish adolescent soccer players, Calvo, Cervelló, Jiménez, Iglesias, and

Murcia (2010) found that those who were high in perceived autonomy were likely to persist longer at their sport, presumably reflecting greater intrinsic motivation.

Extrinsic Motivation and Sport

Although intrinsic motivation is a critical topic within sport sciences, there is much more than just intrinsic motivation at work in sports. First, people have many extrinsic reasons for engaging in sports, ranging from being accepted and approved of by friends to hopes of fame and fortune. Second, even though sporting activities have many moments of intrinsically motivated engagement and even flow (Csikszentmihalyi, 1975), these moments are often separated by long periods of hard work. In sports, practice and skill building, which are essential to high performance, can often be repetitive rather than novel and interesting. Moreover, high levels of performance typically require arduous and disciplined conditioning and exercise, from wind sprints for soccer players to weightlifting for wrestlers. Third, even when sport is highly intrinsically motivating, the social context, typically represented by parents and coaches, often involves both direct extrinsic incentives and contingencies of approval that can influence the athletes' attributions, motivations, and subjective experiences. Accordingly, any motivational psychology of sport must address the nonintrinsically motivated aspects of those pursuits.

As we explained in Chapter 8 on organismic integration theory (OIT), extrinsic motivation can vary in the degree to which it is autonomous as a function of the degree to which the target individual has internalized and integrated regulation for these instrumental behaviors. For example, for football (soccer) players, doing ball drills is certainly important, yet the activity itself may not be experienced as highly enjoyable. Instead, the motivators for this activity lie mainly in its instrumentalities, whether they be to please coaches and avoid their wrath or to become a more skilled player. All types of extrinsic motivation—external regulation, introjected regulation, identified regulation, and integrated regulation—can apply to sport behaviors. In fact, research by Chatzisarantis, Hagger, Biddle, Smith, and Wang (2003) meta-analyzed 21 published studies and reported that results supported the existence of the OIT-based continuum of autonomy for extrinsic motivation in this domain.

Optimally, athletes would be intrinsically motivated for many aspects of their sport and relatively integrated in their extrinsic motivations for the other aspects. Together, the mix of intrinsic motivation and integrated extrinsic motivation are referred to as autonomous motivation, and autonomous motivation is facilitated by satisfaction of the basic psychological needs. Much of the research on sport, particularly field research rather than laboratory experiments, has focused on autonomous motivation, sometimes predicting it from satisfaction of the basic psychological needs and sometimes using it to predict the persistence, performance, and well-being of athletes.

Lonsdale, Hodge, and Rose (2009) examined how more self-determined forms of motivation were associated with burnout in elite athletes from Canada. They found generally that the more autonomous the athlete's motivation, the fewer the symptoms of burnout he or she had (see also Hodge, Lonsdale, & Ng, 2008). Similarly, Holmberg and Sheridan (2013) examined antecedents of burnout in a large sample of U.S. college athletes from various sports. They found a strong relationship between the degree of autonomy and various indicators of burnout, such as devaluation, reduced feelings of accomplishment, and exhaustion.

Although engaging in goal-directed behavior can often be difficult, research by Ntoumanis and colleagues (2014) found that when athletes' motivation to pursue the

goals was more autonomous, the athletes were more persistent, showed more positive affect, and reported more interest in future task engagement. In a study by Smith and Ntoumanis (2014) in which participants faced goals that were unattainable, those who were more autonomously motivated were slower to disengage but faster to reengage.

In an examination of need satisfaction and autonomous motivation in British athletes, Ntoumanis and Standage (2009) found that the athletes' degree of basic psychological need satisfaction predicted their autonomous motivation for the sport. In turn, their autonomous motivation predicted their behaving in more moral and sportsperson-like ways (i.e., fair play, respect for other athletes), whereas need frustration predicted controlled motivation and the display of antisocial attitudes by the athletes. In fact, growing data suggest that the more controlled, relative to autonomous, athletes' motivation is, the more they are prone to un-sportsperson-like behaviors. For example, Donahue, Miquelon, Valois, Goulet, Buist and Vallerand (2006) showed that intrinsically motivated athletes had more sportsperson-like attitudes and were, in turn, less likely to use performance-enhancing drugs, as did Barkoukis, Lazuras, Tsorbatzoudis, and Rodafinos (2011), who sampled Olympic-level competitors. Hodge, Hargreaves, Gerrard, and Lonsdale (2013), in contrast, found no relationship between coaches' autonomy support and attitudes toward the use of performance-enhancing drugs, instead finding that controlling coach behaviors predicted susceptibility to such drug use, mediated by greater moral disengagement. In yet another relevant study, Hodge and Lonsdale (2011) reported that autonomy-supportive coaching styles predicted prosocial behavior toward teammates, a relation that was mediated by autonomous motivation. Athletes' controlled motivation was, in contrast, associated with greater antisocial behavior toward teammates and toward opponent players. Both of these latter relations were mediated by moral disengagement.

In sum, because sports involves extrinsic as well as intrinsic motivation, internalization is an important issue. The more that athletes and players can internalize the value of their efforts and willingly engage in the less-than-fun parts of athletics, the better will be their overall experience, persistence, and performance over time.

Coaching, Motivation, and Sport Outcomes

Although many factors can influence athletes' intrinsic motivation and internalized motivation, the coach-athlete relationship may be among the most critical (Langan, Lonsdale, Blake, & Toner, 2015). Much SDT research supports this view. Many studies have examined autonomy support provided by coaches and used it to predict the athletes' autonomous motivations, perceived competence, and need satisfactions. In turn, those important motivation variables have been related to various sport and physical activity outcomes. For example, Joesaar, Hein, and Hagger (2012) did a longitudinal study in which they found that athletes in early to mid-adolescence who perceived their coaches to be more autonomy-supportive displayed higher levels of intrinsic motivation 1 year later, and Amorose and Horn (2001) found comparable results with collegiate athletes. Sheldon and Watson (2011) found that coaches' autonomy support toward varsity university athletes predicted not only the athletes' intrinsic motivation but also their autonomous extrinsic motivation, which were in turn related to the athletes' positive team experiences. Further, Smith, Ntoumanis, and Duda (2010) found coaches' autonomy-supportive behaviors to predict the athletes' autonomous motivation for sports, and this motivation predicted the athletes' well-being. Fenton, Duda, Quested, and Barrett (2014) found that autonomy support provided by coaches to adolescent football (soccer) players

positively predicted autonomous motivation for sport engagement, which in turn positively predicted moderately vigorous physical activity and negatively predicted sedentary time. Mahoney, Gucciardi, Ntoumanis, and Mallett (2014) found that supportive coaching of cross-country runners yielded greater “mental toughness.” As well, a longitudinal study of soccer players from Spain revealed that the degree to which coaches behaved with a supportive style predicted team cohesion and player satisfaction (García-Calvo, Leo, Gonzalez-Ponce, Sánchez-Miguel, Mouratidis, & Ntoumonis, 2014).

Unfortunately, not all coaches support the autonomy and other basic psychological needs of their athletes. Several studies have compared autonomy-supportive coaching to controlling coaching. For example, a study of adolescent athletes who perceived their coaches to be autonomy-supportive found that the athletes experienced greater sport engagement, whereas those who experienced their coaches to be controlling showed sport disaffection (Curran, Hill, Hall, & Jowett, 2014). Additionally, Healy, Ntoumanis, Veldhuijzen van Zanten, and Paine (2014), collecting data from athletes from many different sports, found that, although coaches who were autonomy-supportive promoted higher autonomous motivation and vitality and less burnout and ill-being, coaches who were controlling in their interpersonal styles prompted greater need frustration and controlled motivation among their players, which led to more burnout and physical symptoms.

Need Satisfaction in Sport

Some of our discussion of intrinsic motivation in sports focused on the importance of satisfaction of the competence and autonomy needs for promoting this type of autonomous motivation. However, satisfaction of the third basic psychological need—*relatedness*—is also considered extremely important within SDT both for intrinsic motivation in social activities (which includes many sports) and for internalization. That is, satisfaction of the autonomy, competence, and relatedness needs are all highly important for promoting autonomous motivation, and many sport studies have examined satisfaction of the basic psychological needs, often being predicted from interpersonal climates and being predictors of autonomous motivation and a range of positive sporting outcomes (Ntoumanis & Mallett, 2014). We have already mentioned a few such studies in passing, but we now discuss a few more studies of need satisfaction.

A study of handball players (Isoard-Gautheur, Guillet-Descas, & Lemyre, 2012) revealed that a perceived autonomy-supportive coaching style was associated with greater autonomy and competence need satisfaction, whereas a more controlling coaching style was associated with lower levels of autonomy and relatedness. In turn, the lower levels of fulfillment of these basic psychological needs predicted lower levels of autonomous motivation and higher levels of athlete burnout.

Using cluster analysis, Lundqvist and Raglin (2015) categorized expert athletes at the sport of *orienteering* on the basis of their well-being and stress levels. The researchers found that the athletes who showed the highest well-being and lowest stress were the ones who experienced the most need satisfaction and the least need frustration.

Sheldon, Zhaoyang, and Williams (2013) studied undergraduate basketball players to determine whether satisfaction of their basic psychological needs prior to games would predict the quality of their performance and their postgame need satisfaction. They found that the players who were high on pregame autonomy satisfaction performed very well and that performance during the game contributed to the athletes’ experiencing greater postgame relatedness and competence satisfaction.

Further, Vallerand and Losier (1999) and Mageau and Vallerand (2003) both found that, when coaches were more autonomy-supportive, athletes reported greater satisfaction of the basic psychological needs, and, in a study of Mexican adolescent athletes, López-Walle, Balaguer, Castillo, and Tristán (2012) found that the youths' perceptions of more autonomy support from their coaches predicted the athletes' reporting greater need satisfaction and, in turn, higher well-being.

A study of more than 7,000 youth from soccer leagues in five European countries showed that when coaches were perceived as autonomy-supportive, the young athletes experienced more satisfaction of the basic psychological needs, which predicted lower levels of dropping out of the sport (Quested, Ntoumanis, et al. 2013). Various other investigators have found that autonomy support was associated with need satisfaction, autonomous motivation, and well-being among athletes in sports such as rugby and volleyball (e.g., Duda, Papaioannou, Appleton, Quested, & Krommidas, 2014; Felton & Jowett, 2013b; Mack, Wilson, Oster, Kowalski, Crocker, & Sylvester, 2011; Pope & Wilson, 2012).

A study by Curran, Hill, and Niemiec (2013) found that structure, which has been shown to promote competence in various domains, was related to young soccer players' behavioral engagement and that this relation was moderated by autonomy support from the coaches. In other words, autonomy-supportive structure led to need satisfaction and engagement, but structure that was not autonomy-supportive did not have these positive consequences. This finding complements a similar result in high school education (Jang, Reeve, & Deci, 2010).

In contrast, some researchers have assessed the degree to which coaches were controlling and need-thwarting (e.g., Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011) and found that those coaching climates were associated with athletes experiencing frustration rather than satisfaction of the basic needs, with a range of negative consequences including negative affect and burnout. Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani (2011) even showed that among relatively elite athletes, a controlling coaching climate predicted increased stress entering practices, as indicated by increases in SIgA, an immunological protein that is secreted in moments of acute stress, as well as during self-reported negative experiences. In still a different setting, Sarrazin and colleagues (2002) found that when women handball players felt interpersonally controlled, or low in competence and relatedness to others in the sport, they had low levels of autonomous motivation, which led to the intention of dropping out of their sport.

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Before we place all the responsibility for athletes' sport motivation on the coaches, we should consider that every young athlete typically faces another motivational climate at home. For example, O'Rourke, Smith, Smoll, and Cumming (2014) examined the role of both parenting climates and coaching climates as they related to young competitive swimmers' motivation, performance anxiety, and self-esteem and found that the more the parents pressured their children, the more negative influences there were on the children, in the form of less autonomous motivation, more anxiety, and lower self-esteem, over and above any influences from the coaching climates. In other words, although coaches can have a significant impact on athletes' motivation, as well as their engagement, learning, performance, and wellness, it appears that the approach taken by parents—whether it be

to support or to pressure—also has an important impact on their children's motivation, quality of play, and psychological well-being in relation to sports.

Felton and Jowett (2013a) examined the degree to which athletes were securely attached to their coaches and parents and found that their degree of secure attachment to these authorities was directly related to the athletes' well-being. Importantly for our discussion, they also found that the attachment–wellness relationship was mediated by satisfaction of the three basic psychological needs.

Gagné, Ryan, and Bargmann (2003) studied the daily experiences of relatively high-level gymnasts as they practiced and performed over a 4-week period in a very competitive and sometimes grueling sport. They found that both parents' and coaches' autonomy-supportive styles facilitated the athletes' overall relative autonomy for the sport, with coaches' support being a more potent predictor of daily autonomous motivation for practice. In turn, autonomous motivation predicted positive emotions at practice and stable self-esteem. In contrast, controlling environments and the resulting controlled forms of motivation were associated with greater negative affect and unstable self-esteem. Perhaps the most unique aspect of this study was looking at variations at the within-person level in athletes' motivation for sport and the changes they experienced in well-being from pre- to postpractice. On days when practice was associated with greater experienced need supports, athletes showed more positive changes from pre- to postpractice, including vitality and positive affect.

Coaching Climates among Elite Athletes

Earlier in the chapter, when discussing the effects of awards, rewards, and athletic scholarships on athletes' intrinsic motivation, we raised the point that one function of such extrinsic factors may be gatekeeping—that is, to separate the elite from the non-elite athletes—rather than to motivate all athletes. Implicit in this view is the idea that the elite athletes are immune to negative effects of rewards and other controls; indeed, because rewards and related controls are a big part of what their athletic lives are about, they may become accustomed to them so that the rewards and controls would have little impact on these exceptional players. Or, relatedly, it may be the case that the rewards and controls are just among the myriad challenges such athletes face on a regular basis (Treasure, Lemyre, Kuczka, & Standage, 2007).

A classic study by Pelletier, Fortier, Vallerand, and Brière (2001) examined whether the elite as well as the non-elite athletes are indeed at risk for negative effects from control. Pelletier and colleagues surveyed elite, national competitor swimmers from across Canada concerning both their experiences of the coaching climate (autonomy-supportive vs. controlling) and their personal motivations for sport engagement, assessing motives specified within OIT. The swimmers were then followed over a 22-month period to track their continuing participation versus dropout. Pelletier et al. found first that controlling coaching climates were associated with the athletes' self-reported external and introjected regulation, whereas autonomy-supportive coaching was associated with more autonomous extrinsic motivation (viz., identification) and intrinsic motivation. As predicted, they also found that more autonomous forms of motivation predicted greater persistence over time, whereas both amotivation and controlled motives were associated with more rapid dropout. Indeed, attrition rates over time followed a pattern parallel to the autonomy continuum, such that the more internalized and autonomous the regulation was, the longer the swimmers were likely to persist in this competitive sport context.

Nonetheless, there is a relative dearth of investigations of coaching styles at very elite or professional levels (see Arnold & Sarkar, 2015; Lyons, Rynne, & Mallett, 2012), which is noteworthy given that at these top levels of sport there appears to be high variability in supportive versus controlling styles.

An exception in this respect is a fascinating qualitative investigation of a change in coaching styles associated with the success of the *All Blacks* national rugby team from New Zealand, which achieved consecutive world championships in 2011 and 2015. Hodge, Henry, and Smith (2014) describe the implementation of a “dual-management model” that reflected motivational principles emphasized in SDT, including an autonomy-supportive climate, and fostering basic psychological need satisfactions of autonomy, competence, and relatedness. Specifically, they saw the new coaching atmosphere as highlighting opportunities for choice, ownership, and responsibility for decision making on the part of players, encouraging athletes to take leadership initiative, and using a strength-focused feedback system that was informational rather than controlling and critical. These changes were seen as instrumental in enhancing team spirit and performance.

A rare intervention study in a highly pressured sport atmosphere was accomplished by Cheon, Reeve, Lee, and Lee (2015), who worked with coaches involved in the *London 2012 Paralympic Games*. Coaches and their respective athletes were assigned to either a control group or a group that received an intervention promoting more autonomy-supportive styles. Results revealed that athletes in the control group experienced deterioration in all indicators of motivation, engagement, and functioning over time. In contrast, the motivation, engagement, and functioning of athletes in the experimental group were generally maintained. Athletes of coaches in the experimental (autonomy-supportive coaching) group also won significantly more Olympic medals than those in the control group.

In fact, we suggest that need satisfaction, which is facilitated by autonomy-supportive coaching, is likely to be equally important at all levels of sport. Yet elite contexts can often involve more pressure toward winning, which can readily translate into more controlling styles. Focusing on process rather than outcomes may, in fact, be an effective strategy to enhance both need satisfaction and performance, even at the top of the sport world.

Support for Coaches

Studies have shown that it is possible to train coaches to be more supportive of their athletes' basic psychological needs. For example, as we reviewed above, Cheon et al. (2015) trained coaches to support their athletes by being mindful of the athletes' basic psychological needs, providing rationales when making requests, acknowledging the athletes' negative affect, using nonpressuring language, and being patient with the athletes. Intervention-group coaches became more need-supportive, and this in turn was associated with better motivational and performance outcomes.

Although it is clear that coaches' being supportive of athletes' basic psychological needs yields a range of positive outcomes for the athletes and their teams, it is important to keep in mind that the coaches themselves need to experience satisfaction of the competence, autonomy, and relatedness needs in order to be optimally engaged in coaching and to be supportive of their athletes. Research with coaches has shown that when their needs were thwarted by pressure from above (e.g., from administrators) and/or from below (e.g., from disengaged athletes), they were less autonomous in their own motivation and, predictably, they were less autonomy-supportive toward their athletes (Rocchi,

Pelletier, & Couture, 2013). In social contexts that are full of pressure to win, coaches as well as athletes pay significant costs because they fail to experience the nutrients that are so essential for effective and healthy functioning in their roles.

Coaches' satisfaction is also affected by the climate of their teams. For instance, in a study of youth soccer coaches, Curren, Hill, Hall, and Jowett (2014) assessed coaches' perceptions of social unity in their group of athletes, which could be viewed as support (and low pressure) from below. When teams were more socially unified, coaches were more autonomy-supportive of their athletes. Interestingly, the coaches' being more autonomy-supportive predicted their experiencing greater need satisfaction, suggesting that for coaches, giving autonomy support is need-satisfying. This would further suggest that the relationship between coaches being autonomy-supportive and experiencing need support is bidirectional, as studies already reviewed indicated that need satisfaction led to being autonomy-supportive.

Sports in the Contemporary World

Sporting activities provide opportunities for expressing our active nature. In sport, people engage in challenging, sometimes arduous, activities at times for the sheer delight of doing it, but at other times for some extrinsic outcomes. A merely hedonic perspective cannot adequately account for the enjoyment of sport, which at times will be accompanied by pain and discouragement, as well as joy and triumph. In our view, it can be understood in a relatively full way only by grasping the importance of the basic psychological need satisfactions—the sense of purpose, the feelings of achievement, and the satisfactions of teamwork—that sports can afford even in the moments of hardship and effort.

To a significant degree, our discussion in this chapter has been about the broad arena of youth, amateur, and recreational sports, and we have reviewed extensive research showing how such pressures in the form of rewards and recognition, ego involvements, and the intense desires to win competitions can undermine intrinsic motivation for the sports and interfere with internalization of behavioral regulations for doing the more difficult and grueling activities that contribute to honing one's skills and learning new moves. An understanding of such findings is particularly important in sports programs for youth, in which cultivating intrinsic motivation is critical for promoting maintenance of the activities over time (Cronin & Allen, 2015).

Unfortunately, all too often, coaches and parents lose sight of this, fostering atmospheres that are controlling, critical, and focused on winning (e.g., Grolnick, 2002; Mandigo & Holt, 2002; Reeve & Deci, 1996). With an intense focus on performance and the extrinsic goal of winning, adults can often drive students and youth away from sports rather than toward them, especially those children and adolescents who might benefit from participating if they had need-supportive conditions.

It is interesting that the athletes may not see the situation the same way as the coaches or parents do. For example, a study of athletic teams by Cumming, Smoll, Smith, and Grossbard (2007) found that the primary basis for young adolescent athletes' evaluating their coaches was not win-loss percentages but was, instead, the degree to which the coaches were autonomy-supportive and did *not* promote ego involvement. For most of these young athletes, winning was not the be-all and end-all. Yet to the extent that winning is an emphasis for coaches and parents, the more pressuring they are likely to be toward the athletes. That in turn was likely to increase the probability of decreasing long-term involvement in sports (see also Wang, Sproule, McNeill, Martindale & Lee, 2011).

Concerning elite and professional sports, they are much more than just games; they are an industry. And their dominance in modern cultures has no doubt added to the orientation toward pressure that seems present in university sports, high school sports, and increasingly in the recreational sports of people across the lifespan. As we saw, professional athletes, like recreational athletes, are also susceptible to having their motivation undermined by pressures, critical feedback, and rewards.

Sports are increasingly a domain in which interpersonal pressures and extrinsic rewards are used as incentives to perform well. Trophies, awards, scholarships, and other such “motivators” are frequently offered to athletes contingent upon their breaking records or defeating others. For coaches, there may be job opportunities or salary increases if they can “motivate” their athletes to perform and win, and when coaches are faced with such contingencies, they may be more prone to become more controlling and pressuring with their athletes (e.g., Rocchi et al., 2013). In short, although play and sport can serve the purpose of recreation and revitalization, when pressured and controlled, they can also drain energy and even crush the soul.

Looking across the literature on SDT and sport, it seems clear that whereas sport can be intrinsically motivated, both the disciplined aspects of practice and skill development in sports and sustained physical exercise to keep in shape for sports are optimal when a person has both (1) intrinsic motivation *and* (2) well-internalized extrinsic motivation (i.e. identified and integrated regulations). Both types of motivation facilitate what is, normatively speaking, a precarious endeavor (e.g., Matsumoto & Takenaka, 2004; Ntoumanis, 2001)—namely, adhering to disciplined sport development. The studies also show the risks entailed in attaching controlling coaching methods, evaluative pressures, or “high stakes” to sport performance, especially at the amateur level. In contrast, all aspects of the sporting endeavor that support satisfaction of the athletes’ basic psychological needs for competence, autonomy, and relatedness—including parents’ attitudes about their children’s sporting behaviors and the interpersonal climates created by coaches—help athletes remain engaged and integrated as they act in this life domain.

Motivational Processes in Exercise

Sport represents one type of physical activity that promotes both physical and psychological health and that also happens to (on average) be intrinsically motivating. Frederick and Ryan (1993) reported that, although *exercise*, which is another health-promoting type of physical activity, is less intrinsically motivating than individual sports, adult exercisers still indicated that they have a significant degree of intrinsic motivation for exercise activities. Ongoing exercise programs such as aerobics, tae-bo, jogging, tae-kwon-do, walking, or weight training can all have aspects that are inherently satisfying. Yet there are many people who are generally sedentary and have little or no intrinsic motivation for exercise.

The literature suggests, in fact, that if exercisers do not enjoy their activity at least to some extent they are unlikely to persist at it (Ryan, Frederick, Lepes, et al., 1997; Wankel, 1993). Having some intrinsic motivation may be among the most important factors in maintaining exercise over time. Fortunately, therefore, many forms of exercise can be structured to be more interesting and intrinsically motivating (Green-Demers, Pelletier, Stewart, & Gushue, 1998; Teixeira, Silva, Mata, Palmeira, & Markland, 2012). Many exercise programs, for example, provide opportunities for optimal challenge by allowing people to start at any level of difficulty and follow the improvements in their capacities or

skills. Further, the exercisers can be given choices about when and how they engage in an exercise activity and an atmosphere of relatedness can be created. Some physical activities may be more fun than others (e.g., aerobic dancing rather than jogging), so people can select the activities that seem most interesting to them. Through the opportunities individuals have to exercise at a level optimal for them and having choices about numerous factors related to the exercising, it is possible for them to experience greater perceived competence and autonomy for their activity, thus contributing to their intrinsic interest in it.

Of course, exercisers also have extrinsic reasons for engaging in physical activity, which suggests that the autonomy continuum for extrinsic motivation would also be relevant. In fact, many researchers in the exercise domain (e.g., Mullan, Markland, & Ingledew, 1997; Standage, Sebire, & Loney, 2008; Thøgersen-Ntoumani & Ntoumanis, 2006; Wilson, Rodgers, Fraser, & Murray, 2004) have successfully assessed types of regulation and found, for example, that the more autonomous types of regulation (i.e., well-internalized extrinsic motivations, as well as intrinsic motivation) were positively predictive of objectively assessed moderate to vigorous physical activity and a range of other positive behavior and wellness outcomes. For example, a study by Chang (2012) with elderly adults found that both autonomous motivation and perceived competence for physical activity contributed to self-reported health among the participants. Finally, Ha and Ng (2015) recently assessed physical activity of Hong Kong students over a 7-day period using accelerometers. They found that more moderate to vigorous activity was predicted by autonomous motivation, along with less sedentary behavior and higher reported quality of life.

A systematic review by Teixeira, Carraça, Markland, Silva, and Ryan (2012) has shown consistent positive relations between autonomous motivation and exercise persistence. Further, a meta-analytic review of 46 studies, focused on children and adolescents, found links from both autonomous and controlled motivation to physical activity. Specifically, results indicated that across the studies there was a moderate positive relation between autonomous motivation and physical activity and a small negative relation between controlled motivation and physical activity, emphasizing that facilitation of autonomous motivation but not controlled motivation among youth is important for promoting more physical activity (see also Owen, Smith, Lubans, Ng, & Lonsdale, 2014).

Ego Involvement in Exercise and Physical Activity

In the section on sport, we discussed the idea that ego involvement, which is an internally controlled type of regulation, has a range of negative consequences for athletes. However, it is not only sports that can be ego involving; so can exercise. As an example, in cultures in which increasing numbers of people have become overweight, weight is a basis for disapproval both from others and from the people themselves. People can thus become ego involved in being thinner as their self-esteem gets tied to this outcome. They may pressure themselves to exercise, thus being low in autonomy. When they fail to live up to the standards, they are likely to be self-deprecating, which may leave them discouraged and less likely to persist. For example, Markland (2009) found that when women had greater discrepancies between their actual and ideal body weights, they tended to be lower in autonomous motivation, which led them to exercise less. In sum, whereas autonomous motivation facilitates greater exercise and activity, controlled motivation, whether external or internal, tends to have negative consequences for living an active, healthy life, especially over the long term.

Supportive Contexts

Insofar as exercise is guided or led by some type of instructors, those individuals can create interpersonal contexts that support participants' basic psychological need satisfaction (e.g., Mandigo & Holt, 2002; Wilson, Rodgers, Blanchard, & Gessell, 2003) and thereby promote autonomous rather than controlled motivation. As we saw with sport, when general interpersonal climates or coaches' behaviors were more autonomy-supportive and less controlling, they tended to facilitate autonomous motivation and positive physical activity outcomes, and the same has been shown to be true in exercise settings. For example, researchers using a within-person longitudinal approach found that, when dancers experienced autonomy support from their instructors, they reported more need satisfaction, less anxiety, and greater well-being (Quested, Bosch, Burns, Cumming, Ntoumanis, & Duda, 2011; Quested, Duda, Ntoumanis, & Maxwell, 2013).

Various other investigators have also found that autonomy support was associated with need satisfaction, autonomous motivation, and well-being for exercise and physical activities (e.g., Barbeau, Sweet, & Fortier, 2009; Edmunds, Ntoumanis, & Duda, 2008; Duda et al., 2014). Further, studies have shown that interpersonal contexts that supported the three basic psychological needs for autonomy, competence, and relatedness fostered need satisfaction, autonomous motivation, enhanced enjoyment, greater engagement, and sustained involvement in physical activity, whereas those that thwarted the basic needs were detrimental to motivation and engagement in physical activity (e.g., Gunnell, Crocker, Wilson, Mack, & Zumbo, 2013). The relation of basic need satisfaction to physical activity has appeared in many studies (e.g., Sylvester, Mack, Busseri, Wilson, & Beauchamp, 2012) and has held up across a variety of cultures (e.g., Vlachopoulos et al., 2013).

Another approach to examining social-contextual supports has involved various types of interventions intended to enhance autonomous motivation and yield positive outcomes. For example, in an attempt to promote greater exercise among middle-aged women, Moustaka, Vlachopoulos, Kabitsis, and Theodorakis (2012) provided some of the women with an autonomy-supportive program for promoting exercise and others with a similar program that did not have the autonomy-supportive elements. The researchers found that those in the autonomy-supportive program experienced more need satisfaction, more autonomous motivation, and greater subjective vitality than did those in the other group. Using a different approach, Duncan, Hall, Wilson, and Rodgers (2012) were able to enhance people's autonomous motivation with a verbal guided-imagery intervention for exercise participation.

Relatedness and Physical Activity

For many individuals, experiencing positive interpersonal interactions while engaged in exercising or similar kinds of physical activity is both appealing and supportive. Accordingly, Edmunds, Ntoumanis, and Duda (2006) found that people who experienced positive relatedness when engaged in exercise were more autonomously motivated and more able to sustain the exercise over time. In the context of gymnastics, Gagné et al. (2003) found that perceived relatedness predicted increases in well-being during practices. Relatedness is a basic need satisfaction that may be separable from the physical activity per se but that can help engage people in the activity by making the context more enjoyable and fostering feelings of support. That is, people may be more likely to go to their spinning

classes or lift weights if they look forward to interacting with friends or believe that the instructor likes them, and the consequences of doing so are likely to be positive.

Capitalizing on this idea, Buman and colleagues (2011) did a clinical trial to test the efficacy of a peer-volunteer program for promoting physical activity among sedentary older adults over an 18-month period. Participants were assigned either to the intervention group or to usual care within the community. Results showed that at the end of 4 months both groups had become more active without being significantly different in their amount of exercise. However, at the 4-month point, the intervention group had become significantly more autonomously motivated to participate in the exercise than the control group. By the end of the 18 months, those in the intervention group had increased even more in their amount of physical activity, whereas those in the control group were less active than they had been at 4 months. In sum, for the older adults, having a peer with whom to be active led them to become more autonomous in their participation, and that led them to persist at the physical activity over the long term.

Individual Differences in Exercise

The discussion of exercise, like the discussion of sport, has focused heavily on social conditions that facilitate basic need satisfaction, autonomous motivation, and enhancement of both physical activity and well-being. Individuals themselves can, of course, affect their own autonomous motivation and exercise as a function of their personalities or individual differences, although that issue has received relatively little attention. Still, it is noteworthy that Kwan, Hooper, Mangan, and Bryan (2011) found that people high in the autonomous causality orientation were more autonomously motivated for and more engaged in exercise. Thus people's autonomous motivation and active engagement in exercise are facilitated by individual differences such as causality orientations, as well as need support from the social environment.

Goal Contents and Physical Activity

As discussed in Chapter 18, there has also been an emerging strand of SDT research that concerns the content of people's goals as it relates to health. Some theories maintain that if people have goals they value highly and attain them, the consequences will invariably be positive, regardless of what the goals are. SDT, in contrast, suggests that the content is important when predicting outcomes. More specifically, if the contents of people's goals are consistent with satisfaction of their basic psychological needs, the consequences of pursuing and attaining the goals will be positive, whereas if the content is not consistent with need satisfaction, the consequences of holding and achieving the goals are likely to be more negative (Ryan, Sheldon, Kasser, & Deci, 1996).

Initial studies of goal content (Kasser & Ryan, 1993, 1996) found that people's aspirations or life goals tend to divide into two factors that were labeled *intrinsic aspirations* and *extrinsic aspirations*. Examples of intrinsic aspirations are personal growth, relationships, and community, whereas examples of extrinsic life goals are wealth, fame, image, and power. Further, it is noteworthy that when health or fitness values are added to the analyses, they load with intrinsic rather than extrinsic aspirations.

Various studies have examined goals or aspirations as they relate to participation in exercise. Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) studied high school students who were learning the Asian activity of tae-bo. Some were told the activity

would help them lose weight and be more attractive (the extrinsic goal), and others were told the activity would help them be more physically fit and healthy (the intrinsic goal). After learning the activity, the participants demonstrated it for others, and experts rated their performance. Their engagement with the exercise was also assessed during a free-choice period. Results indicated that those who were oriented toward the intrinsic goal for doing this demanding activity were rated as having learned it better and were more persistent in their engagement with it than were those who were oriented toward the extrinsic goal. In a follow-up study, Vansteenkiste, Simons, Soenens, and Lens (2004) created similar extrinsic-goal (being attractive) and intrinsic-goal (being physically fit) conditions, as well as a no-goal comparison group. They also assessed exercise persistence up to 4 months after the training period and found that participants in the intrinsic-goal condition persisted much more than those in the no-goal or extrinsic-goal groups. The researchers also found that the persistence that occurred in the extrinsic-goal group was unrelated to enjoyment and personal commitment, whereas persistence in both the no-goal group and the intrinsic-goal group was correlated with those positive affective states.

Another study (Inglelew & Markland, 2008), this time of office workers, compared the effectiveness of weight/appearance goals versus health/fitness goals for engaging in exercise. They found that participants who were focused on fitness rather than appearance were more effective in maintaining an exercise regimen, a finding consistent with early research by Ryan, Frederick, et al. (1997) in an aerobics context.

Sebire, Standage, and Vansteenkiste (2009) surveyed working adults regarding their intrinsic and extrinsic goals for engaging in physical activity, as well as their autonomous and controlled motivations for those behaviors. Results indicated that people who had a high level of intrinsic relative to extrinsic goal contents reported higher physical self-worth, more exercise behaviors, higher well-being, and more satisfaction of the basic psychological needs. Basic need satisfaction partially mediated the relations of relative intrinsic goals to the outcomes.

In a subsequent study of adults 18–65 years of age, an accelerometer was used to provide an objective measure of moderately vigorous physical activity. After reporting on their goals and motivations, the participants wore the accelerometer for 7 days and also kept an exercise log. Participants high in relative intrinsic goal contents were more autonomously motivated for exercise, and they engaged in more daily physical activity (Sebire, Standage, & Vansteenkiste, 2011).

A study of youth in the Flemish part of Belgium applied goal contents theory (GCT) to predict levels of physical activity. Seghers, Vissers, Rutten, Decroos, and Boen (2014) measured both the goals and pedometer step counts over 7 days in more than a thousand children. Their results supported a hypothesized sequence in which intrinsic goals for leisure-time activities predicted daily step counts through autonomous motivation.

This intrinsic–extrinsic goal-content approach to studying motivation is quite different from the autonomous–controlled motives approach, and yet there are results in the two strands of SDT research that make them complementary. The fact that controlling rewards tend to undermine intrinsic motivation, impair internalization, diminish well-being, and interfere with performance is quite compatible with the findings that a focus on attaining financial goals and other external indicators of worth tends to be associated with diminished wellness, inferior learning, less satisfying relationships, and more sedentary living. What ties these two bodies of work together are their relations to satisfaction versus frustration of the basic psychological needs (Deci & Ryan, 2000).

Motivational Processes and Physical Education

In many countries around the world, children and adolescents take physical education classes, often because it is required. The reasoning for the requirements include the idea that physical activity promotes health, strength, and fitness and may also encourage participation in sports. Physical education classes thus tend to be a mix of sport and exercise. A large number of empirical studies have been done that have examined SDT concepts in physical education classes or similar settings. We review but a few of them here.

Promoting Autonomous Motivation

Early studies of physical education (PE) tended to focus on students' intrinsic motivation. For example, a study of middle school PE students found that perceived autonomy and perceived competence predicted their intrinsic motivation in the class (Goudas, Biddle, & Fox, 1994), and a study of college students studying to become PE teachers found that the students' perceived autonomy and perceived competence for a one-term Olympic gymnastics module were related to the students' intrinsic motivation for learning the module and their intentions to continue with Olympic-related learning in the future (Goudas, Biddle, & Underwood, 1995).

Other investigators focused more broadly on autonomous motivation (both intrinsic and internalized-extrinsic motivation). Taylor, Ntoumanis, Standage, and Spray (2010) used multilevel modeling with adolescent PE students and found that autonomous motivation and perceived competence predicted outcomes such as sustained physical activity outside of classes, as well as inside.

Several of the research teams who assessed autonomous motivation also examined how factors in the learning climate in PE classes influenced the students' motivation, behavior, and well-being. In one case, Mouratidis, Vansteenkiste, Sideridis, and Lens (2011) performed two field studies in PE classes for preteens that showed that, when the classes were more autonomy-supportive, the students enjoyed them more and displayed greater vitality. Further, they found that if the students were more autonomously motivated at baseline, they benefited more from the autonomy-supportive classes. In a study of PE classes in which teachers were focused on physical activities, Lonsdale, Sabiston, Raedeke, Ha, and Sum (2009) examined a particular component of autonomy support. Specifically, they found that if the teachers provided students with a free-choice period during class, their autonomous motivation showed a clear increase.

Need Support and Thwarting

Many of the studies that examined autonomy-supportive learning climates also assessed the students' need satisfaction, as well as autonomous motivation and educational outcomes. For example, Bagoien, Halvari, and Nesheim (2010) found that when PE students perceived their instructors to be more autonomy-supportive, they experienced greater need satisfaction in the classes, which generalized to their lives and resulted in greater well-being and more effort expended in physical activity. Other studies found that autonomy support from the PE teachers was associated with more student autonomous motivation (e.g., Hagger, Chatzisarantis, Barkoukis, Wang, & Baranowski, 2005; Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003) and that basic need satisfaction mediated the relations from autonomy support to autonomous motivation (Standage, Duda, &

Ntoumanis, 2003). Further, Taylor and Lonsdale (2010) found that autonomy support provided by PE teachers promoted need satisfaction and, in turn, subjective vitality and effort expenditure in both British and Chinese samples, suggesting that these phenomena are cross-cultural, applying to both individualistic and collectivist cultures.

A three-wave study of secondary school students showed that their perceptions of autonomy support from their PE teachers predicted activity-related satisfaction of the basic psychological needs. In turn, relatedness need satisfaction positively predicted health-related quality of life, and competence satisfaction positively predicted both physical self-concept and autonomous motivation. Further, autonomous motivation positively predicted physical activity assessed with a pedometer, as well as health-related quality of life and physical self-concept (Standage, Gillison, Ntoumanis, & Treasure, 2012).

Additionally, Standage and colleagues (2003, 2006) found that PE students who perceived the teaching climate to be more autonomy-supportive reported greater satisfaction of the basic psychological needs and more autonomous motivation, and the teachers rated those students who were higher in autonomy as exerting more effort and being more persistent. Relatedly, a study by Parish and Treasure (2003) found that adolescent PE students whose learning climates were more need-supportive were more autonomously motivated and engaged in more physical activity, and Kalaja, Jaakkola, Watt, Liukkonen, and Ommundsen (2009), who studied seventh-grade students from Finland, found that those who were in more need-supportive interpersonal climates were higher on perceived competence, autonomous motivation, and movement in their PE classes. Another study that focused on need satisfaction in PE settings found that more need satisfaction led to more integration of motivation, which in turn was associated with greater well-being (Hagger, Chatzisarantis, & Harris, 2006).

In a study from Norway, Ulstad, Halvari, Sørenbø, and Deci (2016) studied secondary PE students to test a model of PE performance that included SDT variables and learning strategies. They found that, when the teachers were perceived to be more autonomy-supportive, their students reported more satisfaction of their basic psychological needs, which predicted more autonomous motivation and perceived competence, leading to the greater use of such learning strategies as effort regulation, seeking help, and working with peers, resulting in higher grades for the students in the PE courses.

A few studies have examined motor learning, which, although not necessarily part of PE classes, is related. For example, an experiment in which participants used their nondominant hands to throw at a target found not only that autonomy support contributed to good performance—both retention and transfer—on the following day but also that having the participants focus on the target contributed in an additive fashion (Wulf, Chiviacowsky, & Drews, 2015). In other work from that group, the researchers found that providing participants with choice, even choices that were small and relatively unrelated to the target activity, had a positive effect on a motor-learning retention test (Lewthwaite, Chiviacowsky, Drews, & Wulf, 2015).

Controlling Settings

Whereas many studies reviewed herein were focused on the degree of either autonomy support or, more broadly, need support, a few studies have focused on the darker side by examining controlling or need-thwarting interpersonal environments. In a study of Belgian PE teachers, the researchers found that students' ratings of the teachers' being controlling were positively related to the ratings made by trained observers and that teachers'

degree of control predicted students having controlled motivation and amotivation (De Meyer et al., 2014). Further, Papaioannou (1998) found that when there was a climate of ego involvement, which is a type of controlling context, physical education students experienced low levels of autonomy.

In sum, similar to the cases in both sport and exercise, we see that, whereas autonomy-supportive or need-supportive contexts enhance autonomous motivation and have positive consequences for physical activity, controlling or ego-involving contexts decrease autonomous motivation and promote controlled motivation or amotivation, resulting in various negative consequences.

Teachers' Need Satisfaction

The general set of findings about the consequences of autonomy-supportive versus controlling learning climates raises the interesting question of what factors might affect whether teachers are autonomy-supportive or controlling. Some researchers have investigated this question and have found results comparable to those for coaches. Simply stated, when teachers experience need satisfaction within the teaching settings, they are more likely to support the needs of their students, and when they experience need frustration, they are more likely to be need thwarting of their students. For example, Taylor and Ntoumanis (2007) found that teachers who experienced their students as being, on average, high in autonomy were more likely to provide the nutrients of autonomy support, structure, and involvement than those teachers who experienced their students as lower in autonomy. Further, this relation was found to be mediated by the teachers' own feelings of autonomy. In other words, when teachers perceived their students to be autonomous, the teachers themselves behaved more autonomously in their teaching and employed the strategies of autonomy support, structure, and involvement in relating to their students. In addition, Taylor, Ntoumanis, and Standage (2008) found that when PE teachers experienced a low level of pressure on the job, perceived their students to be high in autonomous motivation, and were themselves high in autonomous motivation, they experienced high need satisfaction, and they related to their students by gaining a better understanding of them, providing rationales for requested behaviors, and being instrumentally supportive, which previous research had shown would support students' autonomy (Deci, Eghrari, Patrick, & Leone, 1994). In short, when the PE teachers experienced support for their own needs, they in turn were more supportive of their students' needs.

In contrast, another study of PE teachers found that their perceptions of pressure on the job led to the experiences of frustration of their autonomy, competence, and relatedness needs, which in turn predicted burnout and somatic complaints. Mediation analyses confirmed the role of need frustration (Bartholomew, Ntoumanis, Cuevas, & Lonsdale, 2014), which would undoubtedly lead them to be controlling with their students (Deci, Spiegel, Ryan, Koestner, & Kauffmann, 1982).

The teachers' own personalities also made a difference to their motivation and behavior in relating to their students. For example, research with PE teachers showed that if they were high in the controlled causality orientation as an individual difference, they tended to be less autonomy-supportive and more thwarting of the students' psychological needs (Van den Berghe et al., 2013). On the other hand, PE teachers who were low on the controlled causality orientation were more likely to create autonomy-supportive teaching climates.

Interventions

Because autonomy support has been found to be so important in PE classes, researchers have begun to study interventions aimed at facilitating this attribute. For example, in one study by Perlman (2013), students were assigned to either an autonomy-supportive class, a controlling class, or a balanced class. Results indicated that those students in the autonomy-supportive class engaged in significantly more moderate to vigorous physical activity. Rosenkranz, Lubans, Peralta, Bennie, Sanders, and Lonsdale (2012) found that the use of four specific factors in class helped support students' motivation for physical activity, including standard autonomy-supportive tactics, such as providing a meaningful rationale for the activity and offering choice about activities. Research by Aelterman, Vansteenkiste, Van den Berghe, De Meyer, and Haerens (2014) found that an intervention based in SDT to facilitate PE teachers' becoming more oriented toward providing autonomy-support and structure led the teachers to value these strategies more and to behave in more autonomy-supportive ways, according to assessments by both the students and external observers. Other research testing an intervention with new PE teachers found that as the teachers improved their styles in terms of being more autonomy-supportive, structured, and interpersonally involved their students were positively responsive to these changes, experiencing more need satisfaction, more autonomy, and more engagement in the class (Tessier, Sarrazin, & Ntoumanis, 2010).

In a study illustrating practical, evidence-supported intervention, Cheon, Reeve, and Moon (2012) reported on a semester-long training program for PE teachers aimed at increasing their support for autonomy. At the beginning of the semester, they conducted a workshop focused on students' motivation and teachers' support for the students, using concepts based on SDT. They discussed concrete ways for teachers to be autonomy-supportive of the PE students, including such things as providing choice, listening and being responsive to students' ideas and questions, acknowledging mastery, providing rationales for requested behaviors, minimizing directives, not giving quick solutions to problems, reflecting students' experiences so it was clear that the teachers understood the students' perspectives, encouraging initiatives, and allowing time for independent work (e.g., Reeve, Bolt, & Cai, 1999). After 6 weeks in which the teachers were trying to put these principles into practice in their classes, there was a discussion of all the problems they had been encountering in their attempts to be autonomy-supportive. Another 6 weeks after that, there was a final discussion focused on what teachers had learned that did and didn't work for them in being autonomy-supportive. Reports from both trained observers and students in the classes indicated that teachers had become more autonomy-supportive and that the students showed improvements in their motivational and behavioral outcomes.

In a 5-month, three-wave longitudinal follow-up, Cheon and Reeve (2013) tested the stability of changes that had occurred a year earlier in the autonomy-supportive development program implemented by Cheon et al. (2012). In the follow-up study, the researchers had trained observers to rate teachers' behaviors at the middle of this 5-month period, and three times, at the beginning, middle, and end of the period, they had students report their perceptions of the teachers' autonomy support, as well as their own autonomous motivation, and various educational outcomes. Results indicated that both the trained observers and the students rated the trained teachers as more autonomy-supportive and less controlling than the teachers in the comparison group. Further, the students of teachers in the intervention group also reported more positive motivational and behavioral outcomes.

This review shows just how important and generalizable the central principles of SDT's mini-theories of CET, OIT, and basic psychological needs theory (BPNT) are to physical education. Because we see the goals of physical education as enhancing long-term interest and participation in active living and sports, especially for those already least athletically prone, the promotion of autonomy, competence, and relatedness in PE contexts is especially critical. Our hope is that this accumulating work on facilitative methods helps educators meet these goals.

Concluding Comments

People are naturally active, and physical activity is a source of great recreation and rejuvenation for many people. In this chapter, we reviewed only a fraction of the existing SDT research in three areas related to physical activity: sports, exercise, and physical education. As can be seen, interesting and parallel findings have emerged from the work in each of those three areas of inquiry. First, we saw that intrinsic motivation is important in each of these areas, albeit to different degrees. Most central is that autonomous motivation—intrinsic and well-integrated extrinsic—are extremely important for a wide range of behavioral and well-being outcomes. Further, interpersonal environments that are autonomy-supportive or, more broadly, need-supportive promote autonomous motivation and the many positive outcomes that have been shown to follow from it. Many studies have also shown that the link from environmental autonomy support or need support—for example, coaches', leaders', or teachers' supportive behaviors—to athletes', exercisers', and students' autonomous motivation are mediated by those individuals' basic psychological need satisfactions.