Self-Determination Theory Applied to Sport

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Abstract

Sports so acutely illustrate human motivation (i.e., “being moved into action”). To understand the motivational dynamics of sports, researchers have tested propositions within self-determination theory (SDT) for more than 40 years. Here, SDT provides a broad and coherent theoretical perspective to understand the social conditions that promote high-quality forms of athlete motivation and thriving as well as those that contribute to ill-being and impoverished functioning. In this chapter, empirical research findings are collated to review: (1) SDT’s multidimensional perspective of motivation; (2) the motivational and wellness benefits of satisfying, as opposed to frustrating, the basic psychological needs for autonomy, competence, and relatedness; and (3) how the functional significance of various elements of sporting environments differentially affect motivation and sport-related outcomes as a function of being need-supporting or need-thwarting. Practical recommendations are organised around the concept of basic psychological needs. Finally, several directions for future research in sport settings are offered.

Keywords: self-determination theory, motivation, intrinsic motivation, autonomous motivation, psychological needs, social contexts, coaching styles, autonomy support, intervention

Self-Determination Theory Applied to Sport

In tracing the history of self-determination theory (SDT; Ryan & Deci, 2017), it is evident that sports have long provided fertile settings for scholars to test the key assumptions outlined within the theory as well as to apply these principles to inform practice. Arguably, one of the main drivers for this expanding body of research is the fact that sport contexts so acutely illustrate and encapsulate human motivation (i.e., "being moved into action"). Whether one considers a recreational footballer playing for social reasons, a child expanding their physical capacities via engagement in their sports programs, or an Olympian effortfully engaging with their training regime across many years, motivation is at the heart of their endeavors.

When applied to sports, SDT provides a nuanced, broad, and coherent framework to understand the social conditions that facilitate high-quality forms of athlete motivation, well-being, and thriving as well as those that contribute to ill-being and impoverished functioning. Understanding the multifaceted and dynamic nature of motivation, in and across, sport settings is a highly complex task. Thus, SDT's six mini-theories unified via the concept of basic psychological needs provides a coherent structure to empirically test and understand specific motivational phenomena. In this regard, scholars have applied SDT to sport settings for more than 40 years to examine key assumptions, including how distinct goals, different motives, and varying social contexts (e.g., coach-created climates, competition, feedback, and rewards) differentially predict key outcomes such as high-quality forms of motivation, engagement, performance, wellness, and thriving (see Ntoumanis, 2012; Ryan & Deci, 2017; Standage & Ryan, 2020 for reviews).

Rather than attempting to draw together a comprehensive overview of SDT-based research in sport, the aim of this chapter is to provide a brief review, focusing on key findings from a selection of empirical studies. Here, selected works from four key areas of inquiry will be discussed. First, the relation between intrinsic and extrinsic motivation and a range of

sport-related outcomes (e.g., athlete experiences, well-being, and performance). Second, the unifying role of the basic psychological needs within SDT in linking social-contextual factors to motivation, engagement, wellness, performance, and functioning. Third, the differing social environments and conditions that are conducive to supporting (vs. thwarting) the basic psychological needs. Fourth, practical applications and strategies. Lastly, some key areas that future SDT research in sport contexts may take are offered.

Self-Determination Theory and Sport

Intrinsic Motivation

Sports provide millions of individuals with immense joy, interest, and excitement. Indeed, the intrinsic inclinations of people to play in their own time, compete, act in the absence of any apparent external reward, and seek to test and develop their skills and capacities manifest so acutely in sports settings. Reflecting the prototype of autonomous motivation within SDT, multiple benefits of being intrinsically motivated towards sports have been documented, including positive associations with increased deliberate practice (Vink, Raudsepp, & Kais, 2015), greater sport persistence (Jõesaar, Hein, & Hagger, 2011; Pelletier, Fortier, Vallerand, & Briere, 2001), better sport performance (Charbonneau, Barling, & Kelloway, 2001), heightened athlete engagement (Podlog et al., 2015), and enhanced vitality and eudaimonic well-being (Kouali, Hall, & Pope, 2020).

Extrinsic Motivation: A Differentiated Perspective

Ideally, and for optimal growth and development, athletes would be intrinsically motivated toward all their training and competitive endeavors. Yet, people engage in sports for multiple motives, both intrinsic and extrinsic forms of motivation that coexist to simultaneously predict the quality of one's overall motivation (cf. Ryan & Deci, 2017). As outlined by Pelletier and Rocchi (this volume), the second of SDT's mini-theories, *Organismic Integration Theory* (OIT; Deci & Ryan, 1985), was developed to distinguish between different types of extrinsic motivation (i.e., to act for instrumental reasons) that vary

in the degree to which they are experienced as being autonomous (vs. controlled). This multidimensional approach to extrinsic motivation is built around the concept of internalization (cf. Ryan & Connell,1989), with the different types of regulation located on a continuum of self-determination. From the least to most autonomous, these motivational types are *external regulation* (i.e., behavior is regulated by externally controlled rewards, compliance with social pressure, and/or to avoid punishment), *introjected regulation* (i.e., rather than external contingencies, with introjection behavior is regulated via self-imposed intrapersonal contingencies such as shame, guilt, ego enhancement, and pride), *identified regulation* (i.e., behavior is regulated via the conscious valuing of an activity as being important to one's aims/goals), and *integrated regulation* (i.e., behavior which is regulated when the person not only identifies with the value of the activity, but when it has been brought into congruence with the individuals' other core values, goals, and needs) (see Pelletier and Rocchi, this volume, for definitions and a more detailed discussion of each type of motivation).

When applied to sports, as with all life domains, intrinsic motivation and the distinct forms of extrinsic motivation are hypothesized to differentially affect experiences, well-being, functioning, and performance. It is the coherent structure that provides a lens for researchers and practitioners to conceptualize, define, and examine motivation from a *quality* perspective. According to OIT, when behavior is autonomously regulated (i.e., via intrinsic motivation and the well-internalized extrinsic forms of integrated and identified regulations), then greater persistence, higher-quality behavior, improved performance, enriched experiences, and enhanced wellbeing will manifest (Ryan & Deci, 2017). An expanding body of empirical work has documented the many benefits linked to autonomous (or high quality) forms of sport motivation. Here, empirical work has shown autonomous motivation towards sport to positively predict outcomes such as persistence (Pelletier et al., 2001), better performance (Gillet, Berjot, & Gobancé, 2009), positive self-talk (Karamitrou, Comoutos, Hatzigeorgiadis,

& Theodorakis, 2017), more enthusiastic commitment (O'Neil & Hodge, 2020), adaptive coping (Gaudreau & Antl, 2008), greater vitality and wellbeing (Gagné, Ryan, & Bargmann, 2003; Stenling, Lindwall, & Hassmén, 2015), and sportspersonship (Ntoumanis & Standage, 2009). Similarly, autonomous motivation has been shown to negatively predict outcomes such as sport drop-out (Pelletier et al., 2001), burn-out (Barcza-Renner, Eklund, Morin, & Habeeb, 2016; Jowett, Hill, Hall, & Curran, 2013), negative self-talk (Karamitrou et al., 2017), negative affect (Gagné et al., 2003), and constrained commitment (O'Neil & Hodge, 2020).

In contrast to the positive pattern of findings reported for autonomous motivation, research has shown partial or non-internalized forms of motivation towards sport (i.e., introjected and external regulations) to be positively linked with negative outcomes. These outcomes include lower performance (Gillet, Vallerand, & Paty, 2013), athlete burnout (Jowett et al., 2013), sport drop-out (Rocchi, Guertin, Pelletier, & Sweet, 2020), non-optimal coping (Gaudreau & Antl, 2008), negative self-talk (Karamitrou et al., 2017), lower dispositional flow (Lonsdale, Hodge, & Rose, 2008), antisocial attitudes (Ntoumanis & Standage, 2009), and ongoing ill-being (Stenling, Ivarsson, Hassmen, & Lindwall, 2017).

Across organized sports, and yet even more so at the higher levels of performance, athletes are faced with arduous training loads, demanding competition schedules, travel commitments, periods of solitude, and the performing of not very interesting and somewhat mundane tasks/drills (see Treasure, Lemyre, Kuczka, & Standage, 2007). The nature of the tasks, drills, and situations that athletes face can be boring and mundane, yet entirely integral to supporting the development of their athletic skills and capacities. In this regard, well-internalized extrinsic motivation becomes a key driver. Here, the process of internalization (i.e., the active and natural process wherein individuals take on external values, beliefs, and behavioral regulations from social contexts and transfer and integrate these as their own; cf. Ryan & Deci, 2017) makes a valuable contribution to understanding the motivational basis for

effortful engagement in the less interesting aspects of sport. Past SDT work has provided insight into the social strategies required to support internalization, including the provision of a meaningful rationale, conveyance of choice, acknowledgement of feelings, and variety (Deci, Eghrari, Patrick, & Leone, 1994; Green-Demers, Pelletier, Stewart, & Gushue, 1998).

In addition to engaging with the more unexciting aspects of sport, improving one's ability at their chosen sport as well as maintaining high levels of performance also requires considerable investment over a prolonged period. Insight into the role played by intrinsic motivation and well-internalized extrinsic motivation in supporting ongoing sport participation is demonstrated in a prospective study conducted by Pelletier and colleagues (2001). With a sample of 369 competitive swimmers from across the province of Quebec, the authors collected data regarding interpersonal behaviors (autonomy support vs. controlling coaching) and sports motivation at Time 1. Behavioral persistence was then recorded at Time 2 for Season 1 (10 months) and at Time 3 for Season 2 (22 months). Results of structural equation modeling showed that autonomous motivations (both intrinsic motivation and identified regulation) positively predicted greater persistence across both swim seasons. External regulation was unrelated to persistence at the end of Season 1 and a negative predictor of persistence at the end of Season 2. Amotivation was a strong negative predictor of persistence across both seasons. It is worth noting that introjected regulation predicted short-term behavioral engagement (Time 2), yet not over the longer term (Time 3). This finding has been replicated in other domains (e.g., adolescent exercise; Gillison, Standage, & Skevington, 2011) and points to the fact that at times people can be moved into action by self-worth strivings and a desire to gain approval of others, yet the findings also allude to the fact that such introjects are poor predictors of longer-term commitment and engagement and are linked with poorer quality experiential outcomes (e.g., higher anxiety, guilt, and contingent self-worth) (cf. Standage & Ryan, 2012, 2020).

Remaining with the higher end of sport participation and behavioral outcomes, it can

be argued that the most important outcome is that of performance (Standage, 2012). Research using SDT as a theoretical basis to address the "motivation – performance" relationship has shown autonomous sports motivation to positively predict objective performance data as well as coach ratings of performance (e.g., Gillet et al., 2009; Gillet, Vallerand, Amoura, & Baldes, 2010). In one study, Gillet and colleagues (2009) carried out a longitudinal study of 90 young tennis players across three competitive seasons. Autonomous motivation (as assessed via a self-determination index) was shown to positively predict better objective performance data as provided by the French Tennis Federation. Specifically, autonomous motivation at the beginning of a season (Time 1) was shown to positively predict performance across the following two seasons (Times 2 and 3). Autonomous motivation at Time 2 (assessed at the end of the second season) also positively predicted performance during the third season. Such data support the tenets within OIT that when people are autonomously motivated, they experience more interest, excitement, and confidence which manifests in enhanced performance and persistence (cf. Ryan & Deci, 2017).

As reviewed, a robust pattern of empirical findings has supported the tenets proposed within OIT, with intrinsic motivation and well-internalized extrinsic motivation consistently being shown to correspond to higher quality behavioral and psychological engagement in sports. Conversely, more controlled forms of sports motivation have been shown to compromise the quality of sporting engagement, both in terms of psychological and behavioral markers. In view of this compelling body of evidence, it is paramount that both scholars and practitioners explicitly understand a core set of necessary requirements that support the internalization process as well as other markers of thriving in sports. Within SDT, the concept of basic psychological needs explains how variations in the satisfaction and frustration of these necessary requirements differentially predict thriving, development, and wellness as well as diminished functioning, restricted growth, and ill-being. It is to the basic psychological need propositions within SDT that the attention now turns.

Basic Psychological Needs and Sport

The basic psychological needs specified within *Basic Psychological Needs Theory* (BPNT; Ryan & Deci, 2017; Vansteenkiste et al., this volume) form the nexus within the broader SDT framework, serving as the unifying principle that links social-contextual factors with motivation, engagement, wellness, and functioning. When satisfied, the basic psychological needs for *autonomy*, *competence*, and *relatedness* provide the functional requirements for people to experience high quality forms of motivation, thriving, and well-being. Yet, when any of the basic psychological needs are frustrated, greater ill-being, passive engagement, restricted development, and impoverished functioning are hypothesized (Ryan & Deci, 2017).

An expanding body of research within sport settings has provided empirical support for the propositions of BPNT. Indeed, research has shown psychological need satisfaction to positively predict many adaptive sport outcomes such as intrinsic motivation (Jõesaar et al., 2011), thriving (Brown, Arnold, Standage, & Fletcher, 2017; 2021), deliberate practice (Verner-Filion, Vallerand, Amiot, & Mocanu, 2017), dedication (Bhavsar et al., 2020), vitality (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011a; Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011b), behavioral engagement (Curran, Hill, & Niemiec, 2013), performance (Verner-Filion et al., 2017), and enjoyment and wellbeing (Warburton, Wang, Bartholomew, Tuff, & Bishop, 2020). Equally supportive of BPNT, psychological need satisfaction has been shown to be negatively associated with markers of impoverished functioning, including athlete burnout (Bartholomew et al., 2011a; Jowett, Hill, Hall, & Curran, 2016), exhaustion (Bartholomew et al., 2011b), disaffection, depression (Bartholomew et al., 2011a), and negative affect (Bartholomew et al., 2011a).

In recent work, Brown and colleagues (2017) examined the role of need satisfaction and need frustration in relation to identifying British sport performers who thrived in demanding competitive sporting encounters during their past month. Specifically, data were

collected to test whether classifications into ‘thriving’ profile memberships could be predicted from scores for personal enablers (e.g., resilient qualities), contextual enablers (e.g., social support), and underpinning process variables (e.g., need satisfaction, need frustration). Aligned with the propositions within BPNT, the authors found that: (1) higher levels of need satisfaction positively predicted sport performers’ membership into a ‘thriving’ profile; and (2) greater levels of basic need frustration positively predicted the likelihood of sport performers’ membership to the ‘below average’ profile (vs. the ‘thriving’ profile).

In contrast to the positive outcomes associated with psychological need satisfaction, psychological need frustration has been shown to be a positive predictor of maladjustment in sport, with positive associations being reported with exhaustion (Bartholomew et al., 2011b), disordered eating (Bartholomew et al., 2011a), depression (Bartholomew et al., 2011a), negative affect (Bhavsar et al., 2020), burnout (Jowett et al., 2016), and perturbed physiological arousal (e.g., Bartholomew et al., 2011a). Data from sport settings have also shown psychological need frustration to be negatively associated with adaptive outcomes such as vitality (e.g., Bartholomew et al., 2011a, 2011b), performance satisfaction (Felton & Jowett, 2015), and well-being and enjoyment (Warburton et al., 2020).

Within BPNT it is also hypothesized that the basic psychological needs vary within people over time, contexts, and social interactions (Ryan & Deci, 2017). A study by Gagné and colleagues (2003) used a within- and between-person design to follow 33 gymnasts over 15 practice sessions across a 4-week period. Results of multilevel analyses showed that gymnasts who endorsed higher levels of autonomous motivation, had, on average, more positive experiences of their sport and reported greater levels of wellbeing. At the within-person level, changes from pre- to post-practice were shown to be directly linked to the satisfaction of the basic psychological needs within the practice stetting. That is, gymnasts who endorsed higher need satisfaction reported experiencing greater positive affect, increased vitality, better state self-esteem, and lower negative affect.

In a recent prospective study, Brown, Arnold, Standage, Turner, and Fletcher (2021) asked 51 elite British elite hockey players to complete measures assessing their basic psychological need satisfaction and challenge appraisals on seven consecutive days prior to a competitive match. In-match thriving was assessed retrospectively using measures of subjective performance and well-being. The authors also collected saliva samples immediately on waking, and then +0.5, +3, and +5.25 h on the day of the match from a subsample of 21 players who played their game in the early afternoon (i.e., rather than evening when hormonal values would have been lower due to diurnal rhythm). Saliva was assayed for catabolic (i.e., cortisol) and anabolic (i.e., dehydroepiandrosterone [DHEA]) hormones with the 'anabolic balance' also expressed by the ratio of DHEA:cortisol. Results of latent growth modelling showed levels of pre-match psychological need satisfaction and challenge appraisals to positively predict in-match thriving. Although not statistically significant, small and moderate negative associations were reported for thriving with cortisol concentration (+5.25 h sample) and total cortisol exposure across the morning of the match, respectively. The concentration of DHEA shared a small positive, yet non-significant, association with thriving. These trends may be suggestive that athletes who reported that they were thriving were also perceiving and/or employing adaptive response mechanisms on the morning of the match. Yet, in view of issues related to statistical power coupled with the fact that exposure to a chronic stressor can lead to a blunted cortisol response, future work with increased power is needed to assess the associations among key SDT constructs (e.g., need satisfaction/frustration and need-supportive/thwarting contexts), hormonal responses, and athlete thriving. Such research would also extend on the work of Bartholomew et al. (2011a; Study 2) who reported a positive association between need frustration and secretory immunoglobulin A, a finding which suggests that when athletes perceive their needs to be actively frustrated, they are more likely to experience increased physiological arousal and potentially anticipatory apprehension.

With a sample of 61 British University athletes, Bartholomew (2011a; Study 3) conducted a diary study, collecting pre- and post-training data across a two-week period (i.e., 8 training days) to examine whether experiences of need satisfaction and need frustration during training would predict changes in well-being and ill-being before and after each session. Supportive of BPNT, the results of multilevel modeling showed higher levels of need satisfaction during training to positively predict greater levels of positive affect post-training. Equally consistent with BPNT, the authors also reported perceptions of need frustration to predict changes in negative affect and physical symptoms from pre- to post-training.

In addition to diary studies documenting the effects of daily fluctuations of need-satisfaction and frustration on well-being and ill-being outcomes, researchers have also studied the longitudinal associations among the psychological needs and indices of athlete well-being. For example, Gaudreau, Amiot, and Vallerand (2009) followed 265 Canadian hockey players across three measurement periods during the first 11 weeks of a season. Via latent class growth modeling, the authors identified three distinct trajectories for both positive affect and negative affect. Results showed need satisfaction (as well as low and high athletic identity) to substantially increase the likelihood of membership to the more healthy, adaptive trajectory (i.e., as compared to the other two less adaptive trajectories). In a more recent study, Brown, Arnold, Standage, & Fletcher (2021) examined the associations among psychological need satisfaction and thriving with a sample of 268 British sport performers across three occasions spanning 28 days. Results from longitudinal structural equation modeling showed athlete thriving to be highly predicted by both the recent experience of thriving and the satisfaction of the basic psychological needs. The findings of Brown et al.'s research and others in the extant literature (cf. Standage & Ryan, 2020) serve to illustrate the important role that basic psychological need satisfaction serves as a means by which coaches and practitioners can support and maintain athlete thriving across a series of sporting encounters. It is to several features of the social environment that the focus now shifts.

Social Contexts and Supports for the Basic Psychological Needs

Within SDT, the positive and negative influences of social-contextual factors on motivation, wellness, and behavior are distinguished by the extent to which they *support* versus *thwart* a person's basic psychological needs. Therefore, an important strand of SDT research has focused on the nature of social conditions, including external inputs, intrapersonal events, and interpersonal relationships (cf. Ryan & Deci, 2017). Herein, a selection of sport-related conditions will be reviewed in the context of their functional significance.

External Events

Developed and refined primarily during the 1970s and 1980s, *Cognitive Evaluation Theory* (CET; Deci & Ryan, 1985) was the first SDT mini-theory to be formulated, providing a theoretical lens for understanding how differing external events (e.g., rewards, competition, feedback) and later internal events (e.g., ego-involvement, public self-conscience) support or undermine an individual's intrinsic motivation (see Reeve, this volume). Sports provide an excellent testbed for examining an overarching question within CET – i.e., "if a person is involved in an intrinsically interesting activity and begins to receive an extrinsic reward for doing it, what will happen to his or her intrinsic motivation for the activity?" (Deci & Ryan, 1985, p. 43). To explain such effects, two types of social inputs are specified within CET, namely *informational events* (i.e., which are non-controlling and provide effectance-relevant information) and *controlling events* (i.e., which represent pressure to feel, behave, or think in specific ways) (Deci & Ryan, 1985). Within CET, it is hypothesized that informational (or functional) events will enhance and sustain intrinsic motivation via the satisfaction of people's basic psychological needs for autonomy and competence. In contrast, controlling events that frustrate an individual's experience of autonomy and competence are held to undermine intrinsic motivation (see Reeve, this volume).

Rewards. Using a stabilometer task, Orlick and Mosher (1978) were the first to

demonstrate the potential for rewards (i.e., in the form of trophies) to undermine intrinsic motivation in relation to a physical task. Here, the authors allocated children who exhibited initial intrinsic motivation toward the balance task to one of four experimental conditions (i.e., a conditionally expected reward; unexpected reward; no reward but social reinforcement; and no reward and no social reinforcement). Four days later, the children engaged in the task again and their intrinsic motivation assessed. The authors used the free-choice paradigm to assess intrinsic motivation, an approach whereby an observation is made regarding the amount of time spent on an activity when they are alone, free to choose what to do, and have no external or evaluative reason to engage in the target activity. From pre-to-post- reward sessions, results showed that participants in the two reward conditions spent less time choicefully engaged with the target activity than those in the non-reward conditions. From the perspective of CET, these findings suggest that rewards offered in the work of Orlick and Mosher were perceived by the children as being controlling.

A meta-analysis of 128 experimental studies, including the work of Orlick and Mosher (1978), and other sport/motor-task studies (e.g., Vallerand & Reid, 1984; Weinberg & Ragan, 1979) has shown engagement-contingent, completion-contingent, performance-contingent rewards as well as all rewards, all tangible rewards, and all expected rewards to undermine intrinsic motivation (Deci, Koestner, & Ryan, 1999). When applied to sport contexts, the offering of rewards such as trophies and prizes can diminish the intrinsic motivation of athletes when presented in a controlling manner (e.g., implicit messages of incompetence, enhancement of social comparison, and/or identifying and promoting the best athletes) (Ryan & Deci, 2017). As Ryan and Deci (2017) recognize, gatekeeping practices to separate elite athletes from their non-elite counterparts plays an important role in identifying and promoting the best athletes, yet this approach can have dire consequences in youth sport. That is, the employing of practices that emphasize social comparisons may run the risk that many children yet to reach their athletic prime will never do so (Ryan & Deci, 2017).

Athletic Scholarships. A specific type of reward that has received some empirical interest from a CET perspective is that of athletic scholarships (e.g., E. D. Ryan 1977, 1980; Kingston, Horrocks, & Hanton, 2006; Moller & Sheldon, 2020). These performance-contingent rewards are commonly used in the United States, offered to student athletes by universities that are members of the National Collegiate Athletic Association. E. D. Ryan (1977) conducted the initial research into the effects of being awarded a scholarship on student athletes' intrinsic motivation. Here, he found that male football players receiving scholarships reported higher extrinsic motivation (vs. intrinsic) as well as less enjoyment of their sport than their non-scholarship counterparts. Such findings were akin to the undermining effect of "pay for play" and consistent with tenets within CET. A subsequent study by E. D. Ryan (1980) sought to replicate and extend his previous work to male athletes (football players and wrestlers) and female athletes (various sports) from 12 institutions. These data were more complex, revealing gender and sport differences. For female athletes, their intrinsic motivation did not differ as a function of scholarship status. In terms of sport, consistent with his 1977 findings, E. D. Ryan reported support for the undermining effect in the male football players, yet not for male wrestlers nor female athletes from across several different sports. These data were interpreted in the context that the awarding of athletic scholarships to female athletes as well as male wrestlers at the time being "rare". These atypical rewards may have provided informational feedback that was perceived as being indicative of competence. For male football players, the awarding of scholarships was commonplace, attracting them to certain athletic programs, thus viewed as being controlling.

Kingston, Horrocks, and Sheldon (2006) extended the focus on intrinsic motivation to examine whether the multiple types of motivation within SDT could be used to discriminate between US student athletes of differing scholarship status. Here, results showed scholarship athletes to report significantly higher levels of introjected regulation and external regulation and lower levels of intrinsic motivation than their non-scholarship counterparts.

Recently, Moller and Sheldon (2020) examined the 'undermining effect' of athletic scholarships with college athletes attending the University of Missouri, addressing the question of "what happens to former college athletes' intrinsic motivation following college?" After controlling for the time elapsed since college, scholarship status was positively related to felt external motivation during college, and negatively related to present-day enjoyment of their target sport. Such findings provide support for the notion that the undermining effects can be prolonged, spanning decades.

Although studies have provided support for the undermining effects of athletic scholarships on intrinsic motivation, a few investigations have reported no such effect or yielded complex data (cf. Ryan & Deci, 2017). To this end, Ryan and Deci (2017) have argued that more research is required to tease out the circumstances under which scholarships are considered as being informational or controlling in their functional significance.

Feedback. According to CET, competence-affirming feedback will differentially affect an individuals' level of intrinsic motivation to the extent that it is interpreted as being informational or controlling (Deci & Ryan, 1985). In situations where people experience a sense of autonomy and especially when optimal challenge is present, it is likely that positive feedback will increase intrinsic motivation (Ryan & Deci, 2017). Support for this tenet of CET has been demonstrated in several studies. For example, Thill and Mouanda (1990) reported that handball players who received bogus negative verbal feedback (i.e., indicating failure) after shooting at targets reported lower levels of intrinsic motivation than players receiving bogus positive verbal feedback. Similarly, in a study utilizing a stabilometer motor task, Vallerand and Reid (1984) examined: (1) the effects of positive and negative verbal feedback on reported intrinsic motivation; and (2) whether perceptions of competence would medicate the effects of verbal feedback type on intrinsic motivation. Having been pre-screened for holding at least a moderate level of intrinsic motivation toward the task, 84 participants were allocated to one of three conditions: (1) positive feedback; (2) negative

feedback; (3) no verbal feedback. Results showed that positive verbal feedback increased, and negative verbal feedback decreased, the participants' reported intrinsic motivation. Moreover, and supportive of CET, results of path analysis showed perceived competence to mediate the effects of verbal feedback on intrinsic motivation.

Competitive Outcome. When engaged in direct competition (i.e., situations whereby people struggle against each other with a view to maximizing their own successes while minimizing the successes of an opponent; Deci & Ryan, 1985), inevitable outcomes are those of "winning" and "losing." Winning and losing convey competence-affirming and incompetence-affirming feedback, respectively. Previous research in sport settings as well as lab-based experimental work using physical tasks to study the competition process have shown objectively winning a competition to lead to higher intrinsic motivation (i.e., as indexed by self-reported measures or via free-choice behavior assessments, e.g., McAuley & Tammen, 1989; Vallerand & Reid, 1984; Weinberg & Ragan, 1979). As Ryan and Reeve (in press) point out, it is how the competitive outcome affects perceived competence rather than the competitive outcome in and of itself, that explains the ups and downs of intrinsic motivation in competitive settings. Therefore, when considering objective win/loss information, it is important to remember that is also the way in which individuals and/or teams subjectively evaluate their performance that counts. In this regard, past research has shown that when people perceive that they have performed well, they are more likely to report higher levels of intrinsic motivation than those who perceived failure, even if they have been objectively unsuccessful (McAuley & Tammen, 1989).

Lab-based research has also shown participants who were told that they had won competitive trials to report higher levels of need satisfaction, positive affect, and vitality than those informed they had lost (Standage, Duda, & Pensgaard, 2005). The effect of the competitive outcome information and the well-being gains reported in this work were mediated via basic psychological need satisfaction.

Competition. Millions of people worldwide engage in competitive sports wherein a key objective is to have evenly matched athletes or teams compete. Although competition is an integral aspect of sports, it is certainly a complicated social phenomenon. Research examining competition from the perspective of CET is perhaps best known for the early demonstrations that competitive environments that place pressure on individuals to win lead to decrements in intrinsic motivation and enjoyment when compared with the non-competitive engagement in the same task/activity (Ryan & Reeve, in press). Reference in the SDT literature is often made to Deci, Betley, Kahle, Abrams, and Porac's (1981) work, a study within which the authors demonstrated that when people are instructed to win at an activity (in this instance a puzzle task) they perceive competition as controlling and as such it tends to decrease their intrinsic motivation. From the literature, it is clear that controlling elements such as emphasizing the competitive outcome and receiving pressures from others (e.g., coaches, parents, teammates) to achieve an imposed standard can undermine motivation and lead to the darker aspects of sport competition (cf. Ryan & Reeve, in press). For example, Ntoumanis, Barkoukis, Gucciardi, and Chan (2017) in their prospective study of 257 Greek athletes reported perceptions of controlling coach behaviors (indexed by the coach's controlling use of rewards, negative conditional regard, intimidation, and excessive personal control) to positively predict psychological need frustration, and in turn low moral functioning (e.g., favorable attitudes toward cheating and gamesmanship) and doping intentions/doping use.

When competition is not characterized by controlling elements such as pressure to win, it can be enhancing of the basic psychological needs for autonomy, competence, and relatedness (Ryan & Reeve, in press). Indeed, there are numerous adaptive informational elements of competition such as optimal challenge, excitement, and mastery experiences that are conducive to supporting positive experiences, high quality motivation, effortful engagement, and the wellness of competitors.

One example of research that assessed several features of competition was conducted by Tauer and Harackiewicz (2004). Here, the authors assessed the effects of competition, cooperation, and intergroup competition on task enjoyment and performance with a sample of children partaking in a basketball free-throw task. Three findings of interest emerged. First, results replicated the competitive feedback (viz., "success" vs. "failure") findings reported in the CET literature. Second, and in comparing pure competition and pure cooperation, no differences on task enjoyment or performance were reported. Third, intergroup competition was found to consistently lead to the highest levels of task enjoyment and performance (in two of the three studies in which performance was assessed). In appraising their findings, the authors argued that engaging in intergroup competition provided the children with the best overall experience as they derive the benefits available from competition and cooperation. That is, they experience the excitement and challenge of competition as well as the interpersonal enthusiasm and relatedness that comes from having teammates. Considered from a CET perspective, it may also be that the controlling dimension of competition in this work was downplayed in favor of the informational component (Vallerand, 2007).

An exciting avenue of work would be to extend existing lab-based research to real-world settings. Here, research that ecologically tracks how differing features of the competitive process interact to satisfy as well as frustrate the basic psychological needs would be a worthy undertaking. Such work would provide rich insight into the brighter and darker sides of sports competition. Ryan and Reeve (in press) recently proposed a set of *informational* (e.g., autonomy-supportive supervisor, task-involving and relationship-supportive interpersonal climate, perceived challenge, winning, positive effectance feedback/expectancies/information, task involvement) and *controlling* (e.g., pressure to win, controlling supervisor, ego-involving and status-centric interpersonal climate, losing, negative effectance feedback/expectancies, competitively-contingent rewards, ego involvement) competitive elements that would be particularly useful in informing this endeavor.

Intrapersonal Events: Task and Ego Involvement

Task and ego involvement are two intrapersonal events that have implications for the motivation and wellness of athletes. According to CET, the functional significance of task-involvement (i.e., a focus on self-referenced gains, learning, and effortful engagement) is one in which internally informational information supports intrinsic motivation as it facilitates an internal locus of causality and perceived competence (Ryan & Deci, 2017). In contrast, ego-involvement occurs when people put pressure on themselves (i.e., they internalize external contingencies) such that their self-worth hinges on outperforming others (Ryan, 1982). Here, the person is experiencing an internally administered pressure to meet specific outcomes and as such the functional significance of the event is experienced as being controlling, which in turn undermines their perceived locus of causality and subsequently their intrinsic motivation and well-being (Deci & Ryan, 1985; Ryan & Reeve, in press). Lab-based work has provided empirical support for such a proposition, showing that when people feel pressured to perform, they report less intrinsic motivation towards the task at hand than participants told to just try their best (e.g., Ryan, 1982).

In sport contexts, the saliency of competition and a focus on competitive outcomes can, and does, induce ego-involvement. Using a physical co-ordination task, Standage et al. (2005) examined the effects of different competitive features on participants' psychological need satisfaction and well-being (i.e., ego-involving vs. task-involving, working cooperatively vs. working alone, and 'win' vs. 'loss' competitive outcome information). Results showed that participants allocated to the task-involving conditions and those working in cooperation to report higher levels of psychological need satisfaction and well-being. In contrast, those in the ego-involving conditions reported higher levels of negative affect and lower levels of psychological need satisfaction and vitality. Participants who were told that they had "won" reported higher levels of need satisfaction, positive affect, and vitality than those told that they had "lost", whereas participants informed that they had "lost" reported higher levels of

negative affect. Standage et al. also tested when losing was worse via three planned contrasts. Here, the results showed that the effects of losing in an ego-involving competitive structure that centers on individual-based achievement to be the costliest competitive encounter. Summarizing the findings, standardized indirect effects from a motivational process model grounded within SDT showed the effects of the competitive features (i.e., ego-involving context, cooperation context, competitive outcome) affected well-being outcomes via psychological need satisfaction.

The Standage et al. findings provide empirical support for the notion that ego-involvement tends to thwart psychological need satisfaction and undermine motivation and well-being (Ryan & Reeve, in press). Yet, at the same time, and supporting the earlier discussion on competition, the results again highlight that it is not competition *per se* that threatens a person's motivation and well-being in competitive settings. Indeed, it seems that even when "failure" is realized, the quality of the experience can be maintained when competition is couched in a task-involving context and/or cooperation is promoted. As not many athletes are afforded the luxury of always being the winner, such findings are reassuring and informative with respect to how the debilitating effects of competition can be countered.

The functional significance of events such as rewards, feedback, competition, and over time an individuals' intrapersonal dynamics (e.g., ego-involvement) are delivered to athletes by significant others such as coaches, parents, and teammates. In the context of being supportive (or thwarting) of the psychological needs, SDT holds that the interpersonal styles, motivating techniques, intentions, and attitudes of these social agents markedly contribute to the quality of the motivational climate and subsequently to the athletes' motivation, engagement, performance, and wellness (cf. Ryan & Deci, 2017). It is to the nature of interpersonal contexts and past research in sport contexts that the attention now turns.

Interpersonal Contexts

Sports occur in dynamic social contexts wherein athletes bring their goals, values, and

day-to-day life experiences to bear. At the same time, athletes are exposed to different social agents (e.g., coaches, teammates, parents), each varying in how they convey and communicate motivationally laden messages. Issues such as competitive level, competitive calendar, and proximal context (e.g., training or competition) will also influence an athletes' quality of motivation, their sport experiences, and their effortful engagement. Although it is beyond the scope of this chapter to provide a detailed discussion, there is certainly much work to still be conducted on the social dynamics and the complex nature of interpersonal environments in sport. Moreover, and while the social contexts of sport can involve a number of key individuals (e.g., youth sports have both authority figures such as coaches and parents and teammates/peer relationships), in the following, my focus is on coach-created motivational climates.

According to SDT, an athletes' behavioral engagement, sport experiences, performance, and well-being are influenced to the extent to which significant others (e.g., coaches, teammates, parents) support their basic psychological needs for autonomy, competence, and relatedness. In a nutshell, need-supportive environments are viewed as being conducive to high quality motivation, internalization, and thriving whereas need-thwarting social contexts contribute to controlled motivation, impaired functioning, and ill-being. Past SDT research has shown the social contexts promoted by significant others (e.g., coaches and teammates) to play an important role in supporting or undermining motivation quality, well-being, engagement, and performance (cf. Standage & Ryan, 2020).

Akin with other life domains, the interpersonal climate that has received the most empirical attention in sport to date is that of *autonomy support* (i.e., interpersonal environments that are supportive of choice, initiation, and understanding, while minimizing the need to perform and act in a prescribed manner; Ryan & Deci, 2017). Although labeled as "autonomy-support", such contexts enhance the likelihood of an individual satisfying all three needs (Ryan & Deci, 2017). Past work has shown that athletes who perceive their coach to

use an autonomy-supportive coaching style to report a wealth of benefits, including higher need satisfaction (Adie, Duda, & Ntoumanis, 2008; Haerens et al., 2018), greater autonomous motivation (Haerens et al., 2018; O'Neil & Hodge, 2020; Pelletier et al., 2002; Sheldon & Watson, 2011), higher well-being and vitality (Gagné et al., 2003; Haerens et al., 2018), greater engagement (Curran, Hill, Hall, & Jowett, 2014; Delrue, Soenens, Morbée, Vansteenkiste, & Haerens, 2019), better objective team performance (Sheldon & Watson, 2011), and sustained behavioral persistence (Pelletier et al., 2001). Research has also shown the adaptive pattern of findings for autonomy support to hold even in situations wherein athletes were poorly motivated or disruptive (e.g., Delrue et al., 2019) as well as across level of participation (e.g., varsity versus recreational and club sport; Sheldon & Watson, 2011).

Although empirical work shows the multiple benefits for athletes of an autonomy-supportive coaching climate, not all coaches provide such motivational climates for their athletes. One strand of SDT research has been to contrast autonomy support with controlling coaching environments. Controlling coach-created sport climates provide pressure on their athletes to think, feel, and behave in particular, and imposed, ways. Thus, the functional significance associated with perceptions of control manifest very differently to the processes and outcomes associated with autonomy support (i.e., they are characterized by imposed pressures, enforced performance standards, conditional regard, etc.). Supporting such reasoning, and in contrast to the adaptive findings associated autonomy support, perceptions of a controlling coach climate have been shown to be positively associated with a number of maladaptive outcomes, including controlled (or poor quality) forms of motivation (O'Neil & Hodge, 2020; Pelletier et al., 2001), greater sport disaffection (Curran et al., 2014), higher symptoms of burnout (Barcza-Renner et al., 2016), increased cognitive anxiety (Ramis, Torregrosa, Viladrich, & Cruz, 2017), and ill-being (Haerens et al., 2018).

In recent years, there has been a logical shift towards focusing on, and defining characteristics of coach-created climates in a broader manner commensurate with the three

psychological needs outlined within SDT. Here, there has been a shift to distinguishing between *need-supportive* and *need-thwarting* social contexts with measurement tools being developed to assess this broader conceptualization within sport (e.g., Rocchi et al., 2017). In their psychometric validation work with samples of student athletes and coaches from a provincial sporting association, Rocchi and her colleagues reported results that aligned with the propositions of SDT, with athletes who reported their coaches to use need-supportive interpersonal behaviors to also endorse higher psychological need satisfaction and autonomous sport motivation, whereas athletes who reported their coach to employ need-thwarting interpersonal behaviors reported greater psychological need frustration and controlled sport motivation.

The dynamic nature of sport contexts makes it likely that coaches will use a mixture of need-supportive and need-thwarting styles across differing settings. In this regard, Delrue et al. (2017) reported significant variation in 197 Belgium soccer players' perceptions of coach behaviors across five soccer matches (i.e., as being supporting or thwarting of the needs for autonomy and competence). The authors also reported that "in-game" perceptions of supports for autonomy and competence to positively predict prosocial sport behavior and negatively predict antisocial behaviors, whereas perceptions of the thwarting of the autonomy and competence needs were shown to positively predict antisocial behavior and resentment towards the referee.

Within SDT, the satisfaction of *all* three needs is theorized to support ongoing and maintained thriving (Ryan & Deci, 2017). Thus, it would be insightful to include assessments of autonomy-, competence-, *and* relatedness-supports in future longitudinal sports research to ascertain the benefits and costs of exposure to differing motivational climates. Establishing a brief set of items that capture core and differing features of the social context is key to such work. Item response theory would be useful to such an endeavor (Standage & Ryan, 2020).

Practical Implications

A major focus within any application of SDT to sports would be directed at facilitating the basic psychological need satisfactions of both athletes and their coaches. To date, intervention attempts have mainly been conducted in other domains such education and healthcare (e.g., arthritis, hypertension, physical activity, smoking abstinence; cf. Gillison, Rouse, Standage, Sebire, & Ryan, 2019; Reeve & Cheon, 2021). Within healthcare contexts, intervention studies, including several randomized controlled trials, have shown that when patients experience need satisfaction in their treatment, they experience greater volitional engagement in their treatment and demonstrate greater maintenance of desirable health behaviors (cf. Ryan & Deci, 2017).

In the context of education, Reeve and Cheon (2021) recently reviewed 51 autonomy-supportive teaching interventions studies, reporting that: (1) by employing SDT principles in teacher-education interventions, teachers were capable of learning and employing autonomy-supportive styles in their teaching practice; and (2) when teachers become autonomy-supportive, their students experience important and adaptive educational outcomes (e.g., autonomous motivation, engagement, prosocial behavior, perceived skill-development, improved self-concept, etc.). Reynders et al. (2019) applied this "teach the teacher" approach to the sports domain, leading to a "coach the coach" intervention. Here, the authors randomly allocated coaches to a control group or an 'autonomy-support and structure' condition. As a result of the intervention content, both coaches and their athletes reported positive changes in terms of the coaches' autonomy-supportive and structuring coaching behavior (team sport athletes being an exception). Notably, athletes in the intervention group reported increased autonomous motivation and greater engagement than those allocated to the control condition.

The systematic and empirically driven research approach to the development of SDT also provides a clear roadmap for interventions. Being able to map the features, qualities, and nature of environments that are supportive of autonomy, competence, and relatedness is of significant import to sport practitioners (Standage & Ryan, 2020). A clear gap in the extant

literature pertains to the systematic translation of the principles within SDT to inform and improve sports practice for the benefit of all involved. Drawing from a rich body of empirical research across various life domains including sport, exercise, and health (cf. Ryan & Deci, 2017; Standage & Ryan, 2012, 2020; Teixeria et al., 2020), several situational components that provide supports for each basic psychological need that could form part of need-supportive interventions in sports are briefly outlined in the following text. Although listed under a particular need support, it is important to note that these features of the social context can, and often do, support two or more of the basic psychological needs.

Autonomy Supports: (1) provide choice; (2) seek athlete input; (3) elicit, understand, and acknowledge their players' perspectives; (4) employ non-controlling and non-judgmental language; (5) support athlete initiative; (6) explore and set goals rich in intrinsic goal content; (7) provide meaningful rationales; and (8) encourage athletes to experiment with new tasks that could offer challenge and provide opportunities for learning and skill-development.

Competence Supports: (1) provide structure; (2) use informational feedback; (3) appropriately apply positive feedback; (4) clarify expectations to athletes/teams; (5) promote task-involved engagement; (6) support optimal challenge; and (7) provide clear, constructive, and relevant feedback.

Relatedness Supports: (1) express authentic interest in the person; (2) encourage asking of questions and listen to the athletes' reasons; (3) promote a supportive and collaborative context for athletes and their teammates; (4) show unconditional regard; and (5) support cooperation.

Future Directions

Many avenues exist for future basic research and interventions in sport, grounded within SDT, a few of which have already been alluded to within this chapter. Further directions for potential work include:

- Similar to research conducted in school physical education (e.g., Vasconcellos et al.,

2020) and across health settings (e.g., Gillison et al., 2019), it would be insightful to synthesize the available empirical data in sports to quantify the mean associations among SDT variables as well as outcome variables of interest. In this work, researchers should also explore moderating factors (e.g., sex, age, competitive-level, type of sport, culture, country, etc.) associated with heterogeneity in effect sizes to understand how the effect size varies from study to study (cf. Borenstein, Hedges, Higgins, & Rothstein, 2021).

- As the processes within SDT are dynamic and multidimensional in nature, research designs, assessments, and analyses that capture the ongoing interplay among key SDT constructs are required to better understand and predict changes in key sport-related outcomes. Experience sampling, event sampling and longitudinal designs are all critical to advancing the field (Standage & Ryan, 2020).
- As intervention work continues to increase in sport contexts it would be useful to develop a classification of 'Motivation and Behavior Change Techniques' in a similar manner to recent work in health contexts (Teixeria et al., 2020). Such a 'classification system' would: (1) help to systematically identify, define, and classify how "coach intervention techniques" lead to changes in important behavioral and psychological outcomes as a function of satisfying the psychological needs for autonomy, competence, and relatedness; and (2) aid in the development, translation, and the precision of describing and reporting of intervention attempts in sport settings.
- More research is required which tests tenets within the mini-theories of *Relationships Motivation Theory* (RMT) and *Goal Contents Theory* (GCT). With RMT in mind, it would be interesting to longitudinally explore the relational dynamics of differing social agents with similar and contrasting interpersonal styles to examine their influence on the ongoing the strivings, wellness, and behaviors of athletes across training, competition, and different times of the competitive cycle (see Standage &

Emm, 2014 for a discussion of RMT and sport). In terms of GCT, as goal pursuit in sports is highly prevalent, work in the sport domain would benefit from the systematic development of an assessment of participants' intrinsic and extrinsic goal contents (Standage & Ryan, 2020). Such work would provide a foundation to future empirical assessments of goal contents within sport settings.

Conclusions

Within this chapter, only a small proportion of the expansive body of SDT research in sport settings has been reviewed. Several key findings were presented. First, the distinction between autonomous and controlled motivation was discussed from a 'quality' perspective. Here, the multiple advantages of acting through autonomous types of motivation for an athletes' performance, well-being, engagement, and other important sport-related outcomes were reported. Second, the basic psychological needs were reviewed in the context of the role that these functional requirements play in differentially linking various social contextual factors with positive and negative sport outcomes. Here, considerable empirical work has shown psychological need satisfaction to enhance positive outcomes such as high-quality forms of sports motivation, wellness, vitality, engagement, and athlete thriving. In contrast, results have documented the well-being, motivation, and behavioural costs of experiencing psychological need frustration. Third, the functional significance of differing elements of sport-related social contexts (e.g., rewards, feedback, competition, ego-involvement, interpersonal interactions, etc.) were considered from the perspective of being conducive to supporting or thwarting the psychological needs for autonomy, competence, and relatedness. To this end, a large body of research in sports settings substantiate the tenets of BPNT, attesting to the positive outcomes associated with need-supportive social conditions as well as the detriments of environments that thwart the basic psychological needs of athletes and coaches. In view of the importance of the basic psychological needs to understanding the social conditions that facilitate support positive outcomes in sport such as wellness, thriving,

and intrinsic motivation, practical recommendations were organised around specific supports for autonomy, competence, and relatedness. Finally, several specific directions for future research were offered.

Across the past five decades, researchers have drawn from SDT to make original, meaningful, and innovative contributions to our understanding of sports motivation. From the origins of SDT research focusing on how social inputs such as competition, feedback, and rewards sustain or undermine intrinsic motivation through to testing the broad motivational phenomena within and across the current six SDT mini-theories, empirical work within sports has been rife. As we move forward, it will be exciting to see how sports research continues to make contributions to SDT, especially as the theory goes through further expansion and refinement.

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