# The Five Self-Determination Mini-Theories Applied to Sport

Motivation is a key component of maintaining successful and worthwhile sports participation, irrespective of whether sport refers to a sociable game of tennis between friends or an Olympic final with a global audience watching. Scholarly attempts to understand motivational phenomena in sporting contexts have, therefore, gained considerable momentum and a framework which often underpins these endeavors is self-determination theory (SDT). SDT's empirical beginnings are observable in research concerning 'the effects of externally mediated rewards on intrinsic motivation' (Deci, 1971) and the theory began to be applied to sports and competitive settings in the following years (e.g., Vallerand, 1983; Weinberg, 1979). Partly due to this early work, SDT is commonly described as a theory of motivation; however, its expansion to include five complementary mini-theories now encompasses motivation, human development, well-being, and personality. These theories are presented in subsequent sections of this chapter and relevant sport-based research is evaluated. Sporting applications are integrated within this commentary and potential future research questions are raised in the hope of stimulating novel and groundbreaking research.

## Cognitive Evaluation Theory

A central principle of SDT is that humans are active organisms that are fundamentally inclined towards growth, which manifests itself as an innate tendency to engage in activity for its own sake and without external prompts (Deci & Ryan, 2000), This *intrinsic motivation* is evidenced through inherent enjoyment, interest and curiosity during activity (Vansteenkiste, Niemiec, & Soenens, 2010). Cognitive evaluation theory (CET) is the oldest of the self-determination theories and was developed from investigation into the impact of external rewards on the human predisposition towards intrinsic motivation. In initial studies, monetary rewards were found to reduce subsequent intrinsic motivation for puzzle solving and headline writing tasks, whereas verbal approval and positive feedback enhanced intrinsic motivation

(Deci, 1971). The specific nature of rewards and contingencies has subsequently been shown to be important in moderating the undermining effect, for example, unexpected rewards do not damage intrinsic motivation and performance-contingent rewards have a diminished effect (Deci, Koestner, & Ryan, 1999a; 1999b).

CET can explain these consequences as it proposes that intrinsically motivated action can only flourish in contexts that support individuals' fundamental needs for autonomy and competence. Autonomy reflects the feeling of volition, self-organization, and the experience of behavior as congruent with one's integrated sense of self (deCharms, 1968; Deci & Ryan, 2000). Despite some misconceptions, autonomy is distinct from control, independence, or individualism (Chirkov, Ryan, Kim, & Kaplan, 2003; Vansteenkiste et al., 2010). Competence refers to a propensity to be effective and attain valued outcomes within an environment (White, 1959). Environments do not cause intrinsic motivation, but support or thwart it via controlling and informational facets. If controlling aspects of the environment are perceived salient, an individual will feel induced or coerced into action. Autonomy is, therefore, undermined because the true origin of behavior (i.e., locus of causality) shifts from internal to external prompts. In contrast, informational contexts facilitate autonomy and competence because optimal challenges and aptitude-relevant feedback are prevalent (Deci & Ryan, 1985a). Although supported by decades of research, investigators should be aware that the theory is not without debate (e.g., Byron & Khazanchi, 2012).

These theoretical tenets have significance for sport, particularly the competitive ethos embedded within sport. Competition can be an enjoyable opportunity to gauge how one has improved or bring intense pressure from external (e.g., pressure from parents to win a tournament) or internal sources described as ego-involvements (e.g., an athlete believing they must win to be successful and valued by their team; Ryan, 1982). In non-sports contexts, winning a puzzle solving competition has unsurprisingly been shown to enhance competence

and, therefore, intrinsic motivation (Reeve & Deci, 1996). In the same study, when a controlling environment was created by informing participants prior to the task that the only thing that matters is to win, autonomy and intrinsic motivation were diminished. The type of sport played may influence these effects of competition as participants in a hand-grip endurance task reported greater enjoyment (a prototypical indicator of intrinsic motivation) in team versus individual competitions (Cooke, Kavussanu, McIntyre, & Ring, 2013). Tauer and Harackiewicz (2004) reported similar findings during basketball free-throw tasks and suggested that team competition may provide a context where feelings of relatedness are supported, which may increase enjoyment. Indeed, the on-going development of CET incorporated the need to care for others and to be cared for as a third, albeit more distal, antecedent of intrinsic motivation (Deci & Ryan, 2000). In other words, feelings of relatedness may make intrinsic motivation more likely but it is not essential.

CET has also been employed to investigate the influence of athletic scholarships on intrinsic motivation, with equivocal findings reported. On the one hand, track and field scholarship holders have been shown to be less intrinsically motivated, compared to non-scholarship holders (Cremades, Flournoy & Gomez, 2012). Similarly, Kingston, Horrocks, and Hanton (2006) were able to distinguish between scholarship and non-scholarship athletes based on their motives for participation, with intrinsic motivation contributing to this discrimination. On the other hand, scholarship athletes have been shown to be more intrinsically motivated than their non-scholarship counterparts (Amorose & Horn, 2000), and scholarship status was not related to changes in intrinsic motivation over the course of a season (Amorose & Horn, 2001). These mixed results highlight the potential dual influence of external contingencies on intrinsic motivation. Scholarships may suppress autonomy (e.g., 'I must perform because I'm a scholarship athlete') or they may enhance competence (e.g., 'I must be good because they gave me a scholarship'). Longstanding research has outlined that

it is the functional significance, or the subjective meaning of the contextual feature that is the decisive component in shaping motivation and regulating behavior (Deci & Ryan, 1987). Moreover, the degree to which one is predisposed to seek out autonomy may moderate the undermining effect of contextual features on intrinsic motivation (Hagger & Chatzisarantis, 2011).

A third application of CET to sport demonstrates the influence of feedback on athletes' intrinsic motivation. Predictably, positive feedback has consistently been linked to intrinsic motivation, because it is competence enhancing (Mouratidis, Vansteenkiste, Lens, & Sideridis, 2008; Vallerand & Reid, 1984). What is perhaps more useful to coaches and professionals working with athletes is how to communicate remedial feedback without disturbing intrinsic motivation. Corrective feedback provided in an autonomy supportive fashion has been correlated with higher autonomy, competence, and intrinsic motivation in athletes from a range of sports (Carpentier & Mageau, 2013; Mouratidis, Lens, & Vansteenkiste, 2010). Hence, coaches should provide a meaningful (from the athlete's perspective) reason why the feedback may help the athlete, ask the athlete's opinion on the feedback provided, and provide a choice of solutions (Mageau & Vallerand, 2003).

Building on this knowledge, sport could be a fruitful context to advance CET in several important ways. From a broad perspective, Vansteenkiste et al. (2010) highlighted that most research has examined the influence of a single event on individuals' intrinsic motivation. The impact of multiple events (e.g., winning or losing streaks, continual performance evaluation) on intrinsic motivation over a sustained period of time, such as a competitive season, would enhance knowledge. The identification of potential moderators of the relationship between competition and intrinsic motivation would also seem worthy. It is possible, for example, that a positive athletic disposition (e.g., resilience, optimism) or certain adaptive contexts (e.g., a social supportive environment) may buffer athletes against the

potentially negative effects of competitive losses. Relatedly, is the perceived threat or challenge of an upcoming competition most influential for intrinsic motivation or is the outcome (e.g., winning or losing) more significant. It seems plausible that reductions in intrinsic motivation via controlling aspects of competition may precede the competitive event, whereas declines in intrinsic motivation through competence deprivation may be more likely to occur after the event.

A further route of enquiry may explore the proposal that feelings of relatedness are helpful for the facilitation of intrinsic motivation, but not a requisite. Some individuals enjoy their particular sport to get away from the world and be alone, while others love sport because it provides opportunity to socialize and identify with a team. Are there circumstances in which relatedness is particularly significant for intrinsic motivation, compared to other instances where relatedness has very little importance? Is intrinsic motivation more fragile and susceptible to controlling external events when relatedness is not experienced? For instance, the impact of feedback or rewards from a coach may be different if a sense of relatedness is felt between athlete and coach, as opposed to an emotionally distant relationship. These questions could be explored in training situations where relatedness and external contingencies are manipulated or by adopting ecologically valid designs examining the interaction between relatedness need satisfaction and external contingencies.

**Organismic Integration Theory**

Sporting activities are not always driven by eudaimonic enjoyment, attentiveness and natural inquisition that is associated with intrinsic motivation, particularly when one considers the higher echelons of competitive sport. Sports participation, training and competition are often driven by contingent motives, such as the importance of training for successful performance, the yearning to impress others, or the desire to win competitions. These multiple extrinsic motives vary in quality (Deci & Ryan, 2000) and are reflected in the

second theory encompassed within SDT; namely organismic integration theory (OIT). CET explains one manifestation of the human innate growth tendency, intrinsic motivation, whereas OIT focuses on a second. All individuals are predisposed to internalize extrinsically driven behavior so that it becomes integrated with one's true sense of self (i.e., become self-determined; Deci & Ryan, 2000). The degree to which these extrinsic motivations are self-determined allows these motives to reside on a continuum.

Motives that are devoid of self-determination are termed external regulations and reflect intentions to attain an external reward or to avoid a threatened punishment (Deci & Ryan, 2000). Taking part in sport to collect as many medals as possible or putting effort in during training to avoid the threat of an extra hard fitness session are examples of external regulation. If an athlete is only motivated by these stimuli, then removal of the contingency will limit maintenance of the behavior (Deci & Ryan, 1985a). Next on the continuum lies introjected regulation, which denotes participation in an activity due to self-administered contingencies, such as enhancing self-esteem, pride, or avoiding guilt or shame (Deci & Ryan, 2000). Introjected regulations are, therefore, more self-determined compared to external regulations; however, they represent only partial internalization and are low in self-determination. Expressions of introjected regulation in sport may include needing to beat competitors to feel good about oneself, or a child from a particularly athletic family participating in sport to avoid shaming the family name.

Identified regulations are next on the continuum, which reflect motivation for behavior because one values and endorses the significance and meaning of the activity (Deci & Ryan, 2000). Participating in training because one personally values the subsequent impact upon performance is an example of identified regulation. These motives are relatively self-determined because one recognizes the behavior's value, and has more fully accepted it as their own compared to introjected regulations. Finally, integrated regulation represents the

most self-determined of extrinsic motives, and typifies a state where various identified motives have been assimilated into one congruent representation of the self (Deci & Ryan, 2000). An individual who participates in sport because he or she identifies as being an athlete, and lives all aspects of their life in line with becoming a better athlete would be an example of this regulation. Although not strictly explicated in OIT, researchers often explore the full range of motives described by the wider self-determination meta-theory by considering intrinsic motivation, which represents wholly self-determined functioning, and amotivation. This latter construct embodies a complete absence of motivation. An amotivated individual lacks intention to engage in activity, and perceives no link between his or her efforts and outcomes associated with the activity (Deci & Ryan, 2000). Overall, intrinsic motivation, integrated regulation, and identified regulation are considered self-determined or autonomous motives, whereas introjected and external regulations are considered low self-determined or controlling motives.

There are three primary self-report inventories that tap into sport participants' motivational regulations in English speaking samples; the Behavioral Regulation in Sport Questionnaire (BRSQ; Lonsdale, Hodge, & Rose, 2008), the Revised Sport Motivation Scale (SMS-II; Pelletier, Rocchi, Vallerand, Deci, & Ryan, 2013), and the Situational Motivational Scale (SiMS; Guay, Vallerand, & Blanchard, 2000). The latter inventory aims to assess motivation at any given moment and has frequently been employed in sports settings (e.g., Conroy, Kaye, & Coatsworth, 2006), whereas the BRSQ and SMS-II tap into general motives within the sports context. Scores from these questionnaires can used in several ways, for instance, researchers may choose to examine overall self-determination using a relative index. This is achieved by multiplying each regulation subscale score by an assigned weight according to its location on the self-determination continuum. These product terms are then summed to form an index of self-determination. The weights to be used if employing the

BRSQ or SMS-II are 3 (intrinsic motivation), 2 (integrated regulation), 1 (identified regulation), –1 (introjected regulation), –2 (external regulation), and –3 (amotivation). The SiMS aims to be a brief inventory that taps into fluctuating motives; therefore, it does not measure integrated or introjected regulation. As a result, the weights to be used are 2 (intrinsic motivation), 1 (identified regulation), –1 (external regulation), and –2 (amotivation).

Researchers may also examine each regulation independently or adopt a person-oriented approach where profiles of the various motivations are explored. Each method has advantages and disadvantages; however, adopting the self-determination index may hide important information regarding overall levels of motivation. For example, an athlete possessing low levels of self-determined and controlling motivation would receive the same overall score as an athlete possessing high levels of self-determined and controlling motivation, yet clearly these profiles are meaningfully different (see Ullrich-French & Cox, 2009, for a discussion of this topic in physical education settings). Adopting a person-oriented, rather than a variable-oriented approach may allow researchers to overcome this limitation and identify combinations of motives that are adaptive. As an example of this type of approach, Gillet, Vallerand, and Paty (2013) demonstrated that national tennis players displaying a motivational profile with moderate self-determined motivation and high controlling motivation performed worse in a tennis competition, compared to players with high self-determination and low controlling motivation (study 1 and 2), and players high in self-determined and controlled motivation (study 2). The enhanced performance associated with high levels of both types of motivation may, however, come at a cost. Long distance runners displaying this profile reported higher levels of emotional and physical exhaustion, despite superior levels of performance, compared to athletes displaying other motivational profiles (Gillet, Berjot, Vallerand, Amoura, & Rosnet, 2012).

Irrespective of the measurement approach, a significant quantity of sport-based research generally suggests that adaptive outcomes are associated with self-determined regulations, whereas maladaptive consequences are associated with controlling regulations and amotivation. For example, a recent meta-analysis demonstrated that intrinsic motivation and self-determined extrinsic motivation negatively predicted indices of burnout, whereas amotivation positively predicted burnout. Introjected and external regulation showed no association, or very small positive correlations with burnout (Li, Wang, Pyun, & Kee, 2013). This lack of relationship may be due to the different measurement of motivation, as studies employing the BRSQ tended to find stronger positive associations between controlling regulations and burnout (Li et al., 2013).

Other recent examples of the benefits of self-determined motivation include evidence that self-determination towards sport is associated with pro-social behaviors (Lonsdale & Hodge, 2011), vitality, positive emotions and satisfaction (Blanchard, Amiot, Perrault, Vallerand, & Provencher, 2009; Vansteenkiste, Mouratidis, & Lens, 2010), flow (Lonsdale et al., 2008), intentions to participate in sport (Vansteenkiste, Mouratidis, Lens, & Sideridis, 2008), objective sport performance (Gillet, Vallerand, Amoura, & Baldes, 2010), but not coach-rated performance (Mouratidis et al., 2008). Theoretically expected relationships have also been observed among controlling regulations and sport dropout in a large sample of youth athletes (Garcia-Calvo, Cervello, Jimenez, Iglesias, & Moreno-Murcia, 2010), susceptibility to drug use via moral disengagement processes (Hodge, Hargreaves, Gerrard, & Lonsdale, 2013), anti-social behavior (Lonsdale & Hodge, 2011), and negative affect (Vansteenkiste et al., 2010). Self-determination towards other activities related to sport has also been shown to be beneficial. Specifically, Chan and Hagger (2012) revealed that self-determined motivation towards sport injury prevention was positively associated with adherence to injury prevention behaviors and beliefs regarding safety in sport. Autonomous

motives underlying ideographic goal strivings within sport (as opposed to autonomous motivation towards sport in general) have also been linked to effort, goal attainment, and well-being in cross-sectional and longitudinal research (Smith, Ntoumanis, & Duda, 2007; 2010; Smith, Ntoumanis, Duda, & Vansteenkiste, 2011).

In addition to the motivation of athletes, recent work has begun to consider the motivation of sports coaches and athletic directors. Self-determination towards these roles has been positively associated with coaches' perceived support of their athletes' psychological needs (Rocchi, Pelletier, & Couture, 2013) and negatively related to burnout (Sullivan, Lonsdale, & Taylor, in press). This focus on coaches should continue with the recent development of the Coach Motivation Questionnaire (McLean, Mallett, & Newcombe, 2012), which is undergirded by the self-determination continuum.

These studies have built on considerable earlier work offering general support for the benefits of self-determined behavioral regulation in relation to a variety of outcomes, including persistence (e.g., Pelletier, Fortier, Vallerand, & Briére, 2001), dropout (e.g., Sarrazin, Vallerand, Guillet, Pelletier, & Fury, 2001), morality (e.g., Ntoumanis & Standage, 2009), and well-being (e.g., Gagné, Ryan, & Bargmann, 2003). Similar to the maintenance of intrinsic motivation described by CET, OIT proposes that the internalization growth tendency also requires autonomy, competence, and relatedness to be gratified (Deci & Ryan, 2000). This premise has received substantial, albeit largely cross-sectional support in sport settings (Amorose & Anderson-Butcher, 2007; Blanchard et al., 2009; Hollembeak & Amorose, 2005; McDonough & Crocker, 2007; Ntoumanis & Standage, 2009).

This OIT-informed sports research provides preliminary foundations that research with improved methodologies offering conceptual advancements can build upon. Researchers should now take this opportunity to diversify from cross-sectional, self-report tests of the general postulates of OIT (see Baumeister, Vohs, & Funder, 2007, for a critique of the over-

emphasis on self-reported outcomes within psychology). For example, internalization is a *process*, yet no research has considered the influence of psychological need satisfaction over a sustained period to identify if athletes become *more* self-determined towards sport participation over time. This is particularly important when considering how to engage new sports participants who may join sports teams for non-self-determined reasons (e.g., because their friends go, because they feel compelled to because it's cool). Another interesting research question is whether the internalization process is linear, whereby individuals are generally driven by external regulations, followed by introjected regulations, and so on, or can certain contextual factors lead to significant step changes in internalization? Longitudinal approaches would also allow for the analysis of the temporal ordering of constructs associated with OIT and various outcomes. For instance, Lonsdale and Hodge (2011) used cross-lagged panel models to explore the direction (not causality) of effects between self-determined regulations and burnout in elite rugby players. Analysis revealed that amotivation and controlling motivation (particularly introjected regulation) preceded burnout, whereas, burnout preceded decreases in autonomous motivation. Such findings explicate important information on the motivational processes that occur in sport. Similar analysis could be adopted to examine reciprocal effects of psychological need satisfaction and motivation. It is plausible, for example, that increases in external regulation may lead an athlete to seek less opportunities to experience autonomy and competence, leading to lower need satisfaction.

Competitive sport also offers an appropriate context to further study the impact of extrinsic motivational regulations because training is sometimes punishing, repetitive, and unenjoyable. Athletes may not always rely on autonomous motives, but instead be motivated to not let team mates down or by the knowledge that rivals are training on Christmas day. These introjected regulations may be necessary and effective determinants of maximal sporting performance in certain situations. Focusing on controlling regulations further, the

distinction between approach and avoidance components might be worth investigating. In sample of Belgian sport students, approach-based introjected motives (e.g., impressing others or attaining self-worth) were unrelated to well-being and performance indicators. However, avoidance-based introjected regulation (e.g., avoiding shame or guilt) was a positive predictor of depressive feelings and negative affect, and a negatively predictor of overall well-being and coach-rated performance (Assor, Vansteenkiste, & Kaplan, 2009; Study 2). Extrapolating from this research it is likely that approach and avoidance components of external regulation may also have different outcomes. For example, being motivated to win a trophy may elicit different behavioral, cognitive, and emotional outcomes, compared to a verbal threat of being dropped from the team.

**Basic Psychological Needs Theory**

In the description of CET and OIT, the fundamental processes of intrinsically motivated behavior and internalization were facilitated by satisfaction of autonomy, competence, and relatedness. Basic psychological needs theory (BPNT) focuses on these three needs in more detail and explains that satisfaction of these fundamental needs will lead to psychological health, optimal functioning and well-being (Ryan & Deci, 2000). Importantly, all three needs are necessary and functional costs or substitute processes transpire without sufficient support for any of the needs. These processes may have some value in inadequate circumstances, such as self-worth protection, but are nonetheless associated with suboptimal human functioning (Ryan & Deci, 2000).

BPNT has received significant attention within sports settings; however, this research has often employed self-report outcome variables, which makes firm conclusions hard to draw due to potential common method variance (See Lindell & Whitney, 2001; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Notwithstanding this fact, cross-sectional and longitudinal designs using a composite score of need satisfaction or examining the three

needs individually has generally supported BPNT. Specifically, psychological need satisfaction has been positively correlated with subjective vitality (Adie, Duda, & Ntoumanis, 2008; Mack et al., 2011; Reinboth & Duda, 2006; Reinboth, Duda, & Ntoumanis, 2004), intrinsic satisfaction (Reinboth et al., 2004), positive affect (Gaudreau, Amiot, & Vallerand, 2009; Mack et al., 2011; Quested & Duda, 2010), positive developmental experiences (Taylor & Bruner, 2012), self-esteem (Amorose, Anderson-Butcher, & Cooper, 2009; Coatsworth & Conroy, 2009), enjoyment (Quested et al., 2013), and well-being and adaptive interpersonal behavior in coaches (Stebbings, Taylor, & Spray, 2011; Stebbings, Taylor, Spray, & Ntoumanis, 2012). Relatedness need satisfaction, however, was not correlated with the outcomes in some of the work (Amorose et al., 2009; Reinboth et al., 2004; Stebbings et al., 2011), and also demonstrated limited predictive power in a sample of injured athletes (Podlog, Lochbaum, & Stevens, 2010).

Longitudinal investigations have also taken place which explored within-person change in psychological need satisfaction. This refers to fluctuations from each individual's normal levels, which represents an important distinction from between-person differences because absolute levels are made irrelevant in the analysis (Curran & Bauer, 2011). In a sample of youth soccer players over two competitive seasons, Adie, Duda, and Ntoumanis (2012) demonstrated that within-person changes in competence and relatedness (but not autonomy) satisfaction positively predicted subjective vitality. Gagné et al. (2003) also examined within-person changes in young gymnasts over a four-week period. Increases in the satisfaction of all three needs were consistently linked with indicators of well-being (i.e., positive affect, vitality, self-esteem). Each psychological need was entered into multilevel regression equations separately due to high correlations among the three needs, which may explain the additional predictive utility, compared to Adie et al. (2012). Interestingly, Adie and colleagues (2012) also examined individual differences and found no associations among

psychological needs and outcomes. The authors attributed these null findings to statistical artefacts or measurement issues. If researchers choose to adopt this explanation for null findings, they must also consider that the acceptance of alternative hypotheses may also be spurious.

One exception to the self-report focus concerns a study of recreational basketball players. Participants with higher pre-game autonomy and competence demonstrated greater frequency and better quality shooting, compared to players with lower autonomy and competence (Sheldon, Zhaoyang, & Williams, 2013). Surprisingly, players experiencing high relatedness performed worse in some elements of shooting, which the authors explained by suggesting less aggressive play and greater distribution of shots to team mates occurred in players with high relatedness satisfaction.

Based on the above review, satisfying psychological needs may lead to well-being and potentially superior performance. Conversely, low levels of need satisfaction have been frequently explored as a potential antecedent of negative outcomes in sport. For example, a meta-analysis synthesizing 18 studies concluded that all three psychological needs were inversely related to burnout (Li et al., 2013). Composite psychological need satisfaction has also been inversely related to subsequent cortisol responses (a physiological indicator of stress) in vocational dancers (Quested et al., 2011), and negative affect in volleyball players (Gaudreau et al., 2009). When exploring the three needs independently, young gymnasts reported all three needs to be inversely associated with negative affect (Gagné et al., 2003); however, vocational dancers only reported competence and relatedness satisfaction to be correlated with negative affect (Quested & Duda, 2010). Again, the analytic strategy using by Gagné et al. (2003) may explain this difference in predictive utility.

Despite these findings relating low need satisfaction to negative outcomes, it has been pointed out that low need satisfaction has not always been related to ill-being (Bartholomew,

Ntoumanis, Ryan, & Thøgesen-Ntoumani, 2011). For example, changes in satisfaction of psychological needs were found not to be related to physical and emotional exhaustion (Adie et al., 2012) and physical symptoms of illness (Reinboth & Duda, 2006). Bartholomew and colleagues (2011) explain these null findings by suggesting that low scores on inventories measuring psychological need satisfaction do not adequately capture the intensity of active psychological need frustration. These authors provide the example of a female athlete feeling incompetent because she does not have the necessary skills (i.e., low need satisfaction) versus feeling incompetent because her coach is demeaning and critical of her (i.e., need thwarting). As a result, psychological need thwarting has been argued to be conceptually distinct from low need satisfaction (Bartholomew et al., 2011). Following psychometric validation of a measurement scale (Bartholomew et al., 2011), three studies showed that need thwarting was a better predictor of maladaptive outcomes (e.g., disordered eating, burnout, depression) compared to psychological need satisfaction (Bartholomew, Ntoumanis, Ryan, Bosch, Thorgersen-Ntoumani, 2011).

This scholarly avenue certainly warrants further attention, as considerably more research and development should be conducted before the distinction between need thwarting and low need satisfaction is a well-supported postulate of BPNT. For example, an almost exclusive reliance on self-report instruments exists, therefore, the distinctive correlations among thwarting, satisfaction and outcomes may simply be a measurement artefact (e.g., positive valence need satisfaction items correlating with positive valence outcome items, and negative valence need thwarting items correlating with negative valence outcome items). Moreover, the lone non-self-report outcome variable adopted in the introductory work, secretory immunoglobulin A (SIgA), was used as an immunological indicator of stress and maladaptive human functioning, however, immunoglobulins directly neutralize bacteria and viruses or initiate other immune processes to eliminate infections (Moser & Leo, 2010).

Measuring these proteins in saliva, therefore, is an indicator of adaptive immunity (Brandtzaeg, 1998). At best, using SIgA as an indicator of stress and poor health is a complex issue (Bosch, Ring, de Geus, Veerman, & Amerongen, 2002).

The second area of future advancement lies in clarifying the conceptual distinction between psychological need thwarting and dissatisfaction. Currently, arguments for the discrepancy are founded on contextual influences on psychological needs, rather than the organismic experience of need thwarting. For instance, Bartholomew and colleagues' (2011) example of need thwarting described above focuses on the actions of the athlete's coach and an emphasis on the active thwarting of psychological needs *by significant others* was sought during measurement development (Bartholomew et al., 2011). It seems at present, therefore, that the current conceptualization of need thwarting may represent the antithesis of contextual support for human psychological needs, rather than the antithesis of need satisfaction.

As well as the conceptual and methodological issues associated with psychological need thwarting, several other future research directions may be pursued. Recruiting young athletes into long-term developmental research would be appropriate for the life-span validation of BPNT that is necessary. The sports context also provides opportunity to explore whether potential deficits in need satisfaction (e.g., lower competence after a competitive loss, lower autonomy after interactions with a coach, less relatedness after training alone) lead to enhanced drives to fulfill those needs in other contexts. Preliminary evidence of this *needs as motives* hypothesis has been observed (Sheldon & Gunz, 2009), however, at what stage do the deficits in need satisfaction become chronic and lead to the development of need substitutes, maladaptive protective mechanisms, or psychopathology?

There are many instances described in previous sections when satisfaction of a particular need has not been associated with the respective outcome variables. When this occurs, researchers often provide ad hoc explanations that do not do justice to the

complexities of the issue. For example, often relatedness need satisfaction has been shown to be uncorrelated with well-being and it is subsequently suggested that this might be expected because relatedness plays a distal role in the process under investigation (e.g., Reinboth et al., 2004). According to SDT, relatedness only plays a secondary role in the maintenance of intrinsic motivation, not the promotion of well-being. In fact, alternative theories would suggest that relatedness is a critical psychological need (e.g., Leary & Baumeister, 2005). Quested, Duda, Ntoumanis, and Maxwell (2013) tested the salience of the three needs for vocational dancers across three different contexts; namely during class, dance rehearsal, and performances. Several differences existed across situations, for example, only daily levels of competence predicted positive and negative affect in performance settings, whereas all three needs were predictive to different degrees in class and rehearsal settings. Future research may wish to continue exploring situations in which the salience of the three psychological needs may vary. Rather than adopting an exploratory approach, it is recommended that researchers formulate a priori hypotheses to be tested, rather than relying on post-hoc speculations.

As demonstrated, psychological need satisfaction is critical for the development of well-being, as well as internalization and intrinsic motivation processes discussed in the previous sections. Based on the organismic-dialectical perspective of SDT, the environment can facilitate or forestall these processes; hence, researchers have focused on the role of the coach in supporting or thwarting psychological needs. The majority of this research has considered autonomy support, which refers to taking the other person's perspective, acknowledging their feelings, providing choice and information, and minimizing pressure (Mageau & Vallerand, 2003). Conroy and Coatsworth (2007a) advocate that demonstrating interest in athletes input and praising autonomous behavior are also autonomy supportive behaviors. Autonomy support has been positively related to all three psychological needs (e.g., Amorose and Anderson-Butcher, 2007), intrinsic motivation (Joesaar, Hein, & Hagger,

2012), and self-determination towards sport (Gillet, Berjot, Vallerand, & Amoura, 2012). Most of the research has, however, used self-report measures of perceived autonomy supportive behaviors. Work has also begun to define and investigate psychologically controlling coaching, which undermines athletes' psychological needs through the use of tangible rewards, feedback to reinforce expected behaviors, excessive surveillance, intimidation, promoting ego-involvement, and conditional regard (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009). Research has found that coach control was negatively associated with autonomy need satisfaction (Blanchard et al., 2009; Isoard-Gautheur, Guillet-Descas, & Lemyre, 2012) and positively associated with changes in need thwarting (Balaguer et al., 2012), controlling motivation and amotivation (Pelletier et al., 2001), and fear of failure (Conroy & Coatsworth, 2007b)

Early work conceptualized control as the opposite of autonomy support (e.g., Deci & Ryan, 1987), however, it has been recently argued that the two types of behavior may be independent in sports contexts and should be analyzed separately (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). If this stance is taken in future research, one must be careful that the measurement chosen is reflective of this approach. For example, often researchers have adapted the Health Care Climate Scale (Williams, Grow, Freedman, Ryan, & Deci, 1996) to measure autonomy support in sport, however, one item taps into control and is reverse scored to assess autonomy support (e.g., 'I don't feel very good about the way my coach talks to me'). Another consideration is whether one conceptualizes autonomy support and control as a set of behaviors or more general interpersonal styles. In sports and education contexts, there is an emphasis on a behavioral perspective whereby lists of autonomy supportive behaviors have been created (e.g., Mageau & Vallerand, 2003; Reeve, 2002). However, this approach may lack contextual sensitivity as different behaviors may be more or less appropriate in given situations. In a case study of soccer coaching for socially

disadvantaged adolescents, providing opportunity for initiative and leadership did not reap benefits for one of the recipients. On the other hand, examples of controlling coaching (e.g., using punishments, making fun of the participants) produced many beneficial motivational outcomes. To adapt a common phrase, it's not what you do; it's the way that you do it and the way that it is perceived (Deci & Ryan, 1987).

**Causality Orientations Theory**

The bulk of early work within CET investigated the effects of different controlling or informational events on intrinsic motivation. The same event, however, can be experienced differently by assorted individuals (i.e., functional significance; Deci & Ryan, 1987). Causality orientations theory (COT) proposes that these individual differences can be explained by three general propensities to orient toward environments and regulate behavior (Deci, 1980; Deci & Ryan, 1985b). Those with a dominant autonomy orientation have a tendency to seek out interesting activities, find value in events, and to act volitionally. Such an athlete may take the initiative in training, interpret feedback as important for improvement, and live according to their long-term athletic goals. In contrast, individuals with a foremost control orientation tend to construe events as controlling and pressurizing, and focus on rewards, gains, and approval. An athlete oriented in this way would rely on the coach to tell them what to do and train hard only when something tangible can be gained. Finally, a prevailing impersonal orientation is characterized by perceptions of incompetence and experiencing behavior as out of one's control. Athletes with this outlook would see most aspects of their sport as too difficult, and perceive outcomes of training or competition to be disassociated with their behavior (e.g., 'winning this match had nothing to do with me').

During the development of the general causality orientations scale, autonomy orientation was positively correlated with adaptive outcomes (e.g., positive ego development and self-esteem) and inversely associated with negative outcomes (e.g., self-derogation,

hostility and guilt). The reverse pattern of associations was observed with a control orientation and to a greater extent with impersonal orientation (Deci & Ryan, 1985b). Examining parents of children participating in sport revealed that a control orientation was positively associated, and an autonomy orientation was negatively related to parents' ego defensiveness, which in turn led to anger and aggressive spectator behavior (Goldstein & Iso-Ahola, 2008). Chan, Spray, and Hagger (2011) asked athletes to consider a time when they were injured and found that an autonomy orientation positively predicted self-determination towards sport, self-determination towards injury treatment and perceived autonomy support from the coach. A control orientation negatively predicted autonomy support from the coach, and positively predicted controlled sport motivation and controlled treatment motivation.

Apart from some exceptions, there is a lack of COT-based research in sport, which presents a wide opportunity for future exploration within this context. The theorized outlook on life seen in autonomy oriented individuals seems to preclude these individuals to the demands of competitive sport. For example, researchers may wish to scrutinize whether autonomously oriented athletes perform better and show greater talent development over a period of time, compared to individuals with dominant control or impersonal orientations. Participants whose autonomy orientation was primed in a laboratory displayed better performance on a rowing machine compared to control-primed participants, and impersonal-primed participants performed worse still (Hodgins, Yacko, & Gottlieb, 2006, Study 3). Sport is also full of potential threats to one's sense of self, such as competitive losses, normative evaluations and public performances. Autonomy oriented athletes may experience these threats, but respond in more adaptive ways, compared to control and impersonal oriented athletes (Hodgins & Knee, 2002).

**Goal Contents Theory**

The newest theory to be added to the self-determination framework is goal contents theory (GCT), which distinguishes between intrinsic and extrinsic goals and their influence on motivation and well-being. Intrinsic goals, such as close relationships and personal growth, are likely to satisfy one's basic psychological needs and lead to greater well-being. Contrastingly, extrinsic goals, such as financial wealth and popularity are unrelated or negatively related to psychological needs and well-being (Kasser & Ryan, 1996). Extrinsic goals are viewed as compensatory pursuits that people place importance on during periods of need deprivation (Vansteenkiste et al., 2010), whereas intrinsic goals promote an inward orientation and are more likely to satisfy innate psychological needs (Vansteenkiste, Soenens & Duriez, 2008).

Intrinsic and extrinsic goals are distinct from autonomous and controlling motivation, as either type of goal can be pursued for autonomous or controlling reasons. A sports star may pursue trophies, fame, and celebrity (extrinsic goals) because they value doing so (autonomous motivation). The same sport star could volunteer his or her time to meeting sick children at the local hospital (intrinsic goals) because his or her club demands it (controlling motivation). Sheldon, Ryan, Deci, and Kasser (2004) demonstrated that the negative effects of pursuing materialistic goals were not explained by the underlying motive for pursuing the goals.

Substantial evidence exists outside of sport to corroborate the theory. For example, the imaginary or real pursuit of materialistic goals has been negatively related to self-actualization, happiness, affect, life satisfaction, vitality, and change in well-being over one year, as well as positively related to anxiety and physical symptoms of ill-being (e.g., Kasser & Ahuvia, 2002: Kasser & Ryan, 1996; Sheldon et al., 2004). Similar results have been found when examining intrinsic versus extrinsic goal attainment, rather than the pursuit of such goals (Kasser & Ryan, 2001; Niemiec, Ryan, & Deci, 2009; Ryan et al., 1999; Sheldon &

Kasser, 1998, Taylor & Stebbings, 2012). Within this collection of work, the attainment of materialistic desires is proposed to be unrelated or negatively associated with well-being because one's sense of self becomes unstable due to a reliance on attaining external rewards and affirmative evaluations by others (Kasser & Ryan, 2001).

In one of the isolated tests of extrinsic and intrinsic goal pursuit in sport, partial support for the theory was found. Competence need satisfaction was associated with intrinsic goal pursuit in Singaporean student athletes, yet autonomy and competence need satisfaction were positively associated with extrinsic goal pursuit. Relatedness need satisfaction was negatively associated with extrinsic goal pursuit (Wang, Sproule, McNeill, Martindale, & Lee, 2011). The authors proposed that the sport environment, in which winning and attaining trophies is emphasized, makes the pursuit of extrinsic goals and rewards less harmful. This argument seems particularly relevant in sports contexts, and debate exists as to whether the pursuit of extrinsic goals is harmful in environments that emphasize such goals (e.g., Sagiv & Schwartz, 2000; Vansteenkiste, Duriez, Simons, & Soenens, 2006). Hence, researchers may wish to deliberate on this topic in more detail.

In addition to the goal-environment match, other future research directions are apparent. As has been done for the exercise domain (Sebire, Standage, & Vansteenkiste, 2008), the development of a sport-specific assessment of goals is necessary. For example, pursuing sport for financial wealth may be irrelevant to all but elite athletes in some sports. Once sound instrumentation has been established, researchers may wish to further explore whether the development of extrinsic goals in sport is a function of innate psychological need deprivation (Williams, Cox, Hedberg, & Deci, 2000). In other words, do athletes focus on extrinsic goals because their needs are not satisfied in sporting contexts? Relatedly, it may be interesting to see if need deprivation in another context (e.g., controlling parents at home) leads to the development of extrinsic goals in the sporting context. Finally, the effects of

intrinsic and extrinsic goal pursuit may vary in certain contexts, in a similar vein to performance, process, and outcome goals in traditional goal setting research (Burton, Naylor, & Holliday, 2001). For example, a swimmer may need to rely on the motivational benefits of imagining medaling at a world championship when preparing for his or her early morning training session. In comparison, intrinsic goal pursuit (e.g., personal improvement) during the training session may be most beneficial.

**Conclusion**

The above review distinguishes between five different theories that form the self-determination meta-theory. Moving forward, it is important to consider the nuances of each theory and the underlying principles from classic SDT work that each theory is grounded upon. Suggesting that relatedness is a distal antecedent of well-being is an example of blurring the boundaries of the five theories that should be avoided in future investigation. Within sports contexts, OIT and BPNT are the most researched of the five theories and researchers should attempt to move beyond cross-sectional research using wholly self-report methods if they only replicate well-established tenets of these theories. Rather than applying the postulates of SDT to sport, scholars should use the sports context to advance new knowledge concerning SDT using robust and innovative research methods. Researchers may also wish to take advantage of the very little attention paid to testing and advancing CET, COT, GCT within sporting milieus. It is hoped that this book chapter provides some inspiration and ideas to advance these theories.

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