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SELF-DETERMINATION THEORY AND PHYSICAL ACTIVITY: THE DYNAMICS OF MOTIVATION IN DEVELOPMENT AND WELLNESS

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Abstract: To introduce this special issue, we overview *self-determination theory* (SDT) as it is applied to physical activity, sport, and health. SDT distinguishes intrinsic and extrinsic motivations for physical activities, and specifies separate mini-theories addressing the nature, determinants, and consequences of each. *Cognitive evaluation theory* (CET) details the central role of intrinsic motivation in both sport and physical activity, and the impact of autonomy and competence supports in promoting people's intrinsic motivation. *Organismic integration theory* (OIT) describes different forms of extrinsic motivation that vary in their relative autonomy, affecting both persistence and performance. OIT suggests that more internalized extrinsic goals, being more volitional, are better maintained over time. We also review *basic psychological need theory* (BPNT), which specifies the role of autonomy, competence, and relatedness satisfaction in facilitating and sustaining motivation, and the impact of intrinsic (e.g., health) and extrinsic (e.g., attractiveness) goals in physical activity. We then outline a SDT perspective on vitality and its depletion, including new research on how contact with nature can enhance subjective energy. We conclude by discussing field research, including controlled clinical trials, testing the efficacy of SDT-based interventions in the promotion of physical activity, and other health-related outcomes.

Key words: Health, Motivation, Physical activity, Self-determination, Vitality.

INTRODUCTION

Humans are often described as "active organisms," and while that may be ideally true it is often not an accurate description of modern persons. Whereas our long-ago ancestors may have been required to get up and move people in modern cul-

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tures are often required to do just the opposite: To sit still. In our increasingly cognitive societies school recesses are being replaced with more instruction, and adults more frequently spend a stationary workday staring at computer screens. And whereas in past times one typically had to go out to find excitement, today excitement is often vicarious or virtual—it is found in movies, video games, and popular websites, all accessible while seated.

These trends are reflected in the changing bodies and activity habits of modernized persons. According to recent statistics, for example, close to a third of children in the USA are overweight, and almost half of these children are obese (Ogden, Carroll, & Flegal, 2008). Although the USA is often leading such trends, the rest of the globalizing world appears to be following both the dietary and activity trends of that culture. Indeed, the World Health Organization described obesity as a growing epidemic in Europe, likely to affect the health of millions of children and adults (World Health Organization Regional Office for Europe, 2006). Not only were dietary factors cited, but also decreases in physical activity and active play (Cavill, Kahlmeier, & Racioppi, 2006). A report by the United Nations (see World Health Organization and Food and Agriculture Organization of the United Nations, 2003) found that obesity was rising quickly in countries from China to Brazil, and even rising in sub-Saharan countries where hunger abounds.

Given these trends, from a health perspective alone, understanding better how to motivate physical activity and lifestyle changes is a critical issue. Yet even from a mental health perspective these are significant issues. In the view of *self-determination theory* (SDT), physical activity can be an inherently rewarding activity that contributes to both happiness and subjective vitality (Ryan & Frederick, 1997). When active, people feel more energy and they satisfy deep psychological needs that contribute to an overall sense of wellness. In this article we overview the SDT perspective on physical activity and what motivates it. We consider physical activity in its various manifestations—from sports, to exercise, to walks in nature, in order to understand what facilitates and what undermines its occurrence, intensity, and impact on wellness.

In this introductory piece our purpose is to outline the general contours of SDT's approach to motivation of physical activity, and in doing so, to help articulate the SDT-derived frameworks employed in the varied articles that appear within this special issue. Rather than representing a review of the empirical literature (see, e.g., Ryan & Deci, 2007), our intent is merely to specify the theoretical tenets of SDT that have been applied in studies of physical activity, including both sports and exercise, and to interventions that can lead to change in these behaviors.

INTRINSIC AND EXTRINSIC MOTIVATION IN PHYSICAL ACTIVITIES

The most basic principle of SDT, when applied to physical activities, is that they can be both intrinsically and extrinsically motivated. *Intrinsic motivation* pertains to engagement in an activity because of the inherent pleasures and satisfactions it provides. Many physical activities are enjoyable in their own right, and require no exogenous rewards or incentives to be performed (Ryan & Deci, 2000a). In contrast, *extrinsic motivation* characterizes activities that are performed in order to obtain some separable outcome, whether that be a tangible reward, an avoidance of a punishment, or the attainment of recognition, or approval. Because the determinants and consequences of intrinsic and extrinsic motivation differ, we discuss each, separately, before we apply understandings of them to varied types of active behaviors.

Intrinsic motivation

The very concept of an active organism implies that organisms have within them a spontaneous tendency to act on their environments and to exercise their skills. Intrinsic motivation represents this idea within SDT. From the SDT perspective, it is argued that intrinsic motivation is a deeply evolved propensity to apply and extend the skills and capacities an organism possesses (Deci & Ryan, 2000). Clearly a proneness to be actively moving, manipulating, exploring and challenging oneself conveys multiple adaptive advantages to a growing organism. Such a tendency is associated with increasing competence within the physical world, and the individual's capacity to cope with its demands (Deci & Ryan, 1985). Yet, as Groos (1898/1976) long ago acknowledged, the future adaptive advantages of physical activity could not exert much of a motivating role on a youthful animal, so there must be *pleasure in activity per se*. And this is what particularly characterizes intrinsically motivated activities—they are experienced as fun and enjoyable. It is thus important to note that the main "reason" people provide for engaging in active sport activities is that they find them interesting, challenging, and enjoyable (e.g., Frederick & Ryan, 1995). They are intrinsically motivated.

According to SDT, however, even the idea that an activity is intrinsically interesting or enjoyable is not fully self-explanatory. There are many activities and ways of living in which one can find intrinsic interests. Yet individuals will gravitate toward and persist at certain activities and avoid others. Thus, in addition to describing the role of interest and intrinsic motivation we have been additionally

focused on specific factors in the social context that can facilitate or undermine intrinsic motivation for an activity or area of endeavor (Ryan, Rigby, & Przybylski, 2006). Specifically, we argue that only activities that satisfy certain basic psychological needs will be experienced as interests and be intrinsically motivated.

Influences on intrinsic motivation: Cognitive evaluation theory. Intrinsic motivation exists in the relation between individuals and activities. Each individual is intrinsically motivated for some activities and not others, and also only at certain times and not others. Therefore, an understanding of intrinsic motivation must consider how the characteristics of an activity are experienced and engaged by the individual and how these experiences are affected by situational and contextual factors and supports.

Within the larger framework of SDT, *cognitive evaluation theory* (CET; see Deci & Ryan, 1985) is a sub-theory that focuses on the determinants of intrinsic motivation. In line with our argument that intrinsic motivation is an evolved and natural propensity, CET is not concerned with what "causes" intrinsic motivation, but rather the conditions that facilitate versus those that diminish or undermine it. CET was first introduced by Deci (1975) as a specific account of the effects on intrinsic motivation of external events such as rewards, threats, and feedback. Since then, the theory has undergone elaborations and refinements (e.g., Deci & Ryan, 1980, 1985; Ryan, 1982; Ryan, Koestner, & Deci, 1991).

Briefly, CET outlines a *social psychology* of intrinsic motivation, because it specifies how social inputs affect intrinsic motivation and the processes and outcomes associated with it. In its broadest outline, the theory argues that events that are perceived to negatively impact a person's experience of autonomy or competence will diminish intrinsic motivation, whereas events that support feelings of autonomy and competence will enhance intrinsic motivation. In addition, and in contrast to social-learning theory approaches (e.g., Bandura, 1989), CET specifies that feelings of competence will not maintain or enhance intrinsic motivation unless they are in the context of autonomy. Thus both feelings of autonomy and competence are necessary conditions for intrinsically motivated behavior.

Both autonomy and competence are experiences that are readily affected by conditions in the social environment. For example, while a given sport activity may be highly interesting to an individual, a controlling coach who pressures and orders about his or her players can easily diminish a person's interest and joy of engagement. Similarly, conditions in which one faces non-optimal, overwhelming challenges can lead to feeling incompetent and to disengage.

This formulation of social contexts is especially applicable to amateur sport

experiences. The main reason amateurs, whether they are youths or adults, play sports is because they find them enjoyable (Frederick & Ryan, 1995; Vallerand, Deci, & Ryan, 1987). When coaches, parents, or fellow players become controlling or critical (which is often potentiated by their own ego-involvement in winning) they can undermine feelings of competence and autonomy that are the foundations of sustained motivation. Players will report that the game is no longer fun as a reason for dropout, but this will in turn be explained by the absence of feelings of autonomy and competence.

Many empirical studies have supported these general principles of SDT (see, e.g., Hagger & Chatzisarantis, 2007). Laboratory studies have discretely manipulated autonomy and competence for games and sport showing the necessity of each. Moreover, field studies have examined the naturally occurring variations in support of these psychological needs, further attesting to their significance in predicting ongoing motivation and involvement in sport. Indeed, a number of articles within the current issue show the impact of these variables on sport-related motivation.

Extrinsic motivation

As previously stated, extrinsic motivation is defined as engagement in a behavior or activity in order to attain some outcome separable from the activity itself. Many sport and exercise activities are extrinsically motivated, although on average exercise tends to be more extrinsically motivated than sport (Frederick & Ryan, 1995; Ryan & Deci, 2006). That is, most people maintain their exercise activities not because the activities are inherently interesting or enjoyable to them, but because they have something to gain in it. That could be because people want to improve their health, or their looks, or because they want to stay in shape to perform other activities, including sports. In fact, most physical activities entail some combination of intrinsic and extrinsic motives, and even the most enjoyable sport activities often require periods of extrinsically motivated practice and drill to develop specific skills. Thus, extrinsic motivation is extremely important in the sphere of physical activities.

Organismic integration theory. Whereas we can speak of intrinsic motivation in relatively unified ways, extrinsic motivation when viewed through the lens of self-determination theory is a much more complex category of motivation. That is, in order to address the determinants and consequences of extrinsic motivation, SDT includes a differentiated taxonomy of the varied types of regulations underlying extrinsic motivation, each of which has unique characteristics (Ryan & Connell,

1989). These distinct extrinsic motivations are described within a second subtheory of SDT, which is called *organismic integration theory* (OIT; see Deci & Ryan, 1985, 2000).

Organismic integration theory is meant to describe the idea that people are: (a) developmentally or organismically prone to internalize and integrate ambient values and practices; and (b) the regulation of such adopted practices and values thus varies in its relative integration to the self. Put differently, OIT recognizes that some behavioral regulations are experienced as relatively alien to the self, or imposed and heteronomous, whereas others can be very much being autonomous and self-endorsed. OIT then describes the antecedent to these variations in autonomy, and the salubrious outcomes associated with greater autonomy.

Briefly OIT specifies a continuum of autonomy underpinning extrinsic motivations. At the controlled or non-autonomous end of this continuum is *external regulation* in which a person's actions are compelled or driven by externally controlled rewards or punishments. Here the behavior is fueled by the contingencies of reinforcement and punishment and thus dependent on these external factors. Because external regulations are not internalized they are not maintained when the contingencies are not salient or explicitly being applied. Next on this continuum is *introjected regulation* in which an individual engages in behaviors to feel better about self-worth or to avoid self-esteem blows or self-disapproval. Introjection is thus based on internal rewards and punishments—it is still controlled behavior, but it represents a greater degree of internalization than external regulation. Still more internalized and autonomous on this continuum is identified regulation, in which the person "identifies with" or personally values the behaviors they engage in. Because action reflects values, behaviors regulated through identification will persist independently of environmental rewards—that is, they will be better maintained than their more controlled counterparts. When identifications are well synthesized and coordinated with the persons' others values (as opposed to being inconsistent or compartmentalized), regulation is described as integrated, representing a high degree of autonomy and self-endorsement. In fact, integrated regulation rivals intrinsic motivation in the relative autonomy experienced by the actor.

As Ryan and Connell (1989) originally pointed out, these varied types of regulation align, both conceptually and empirically, along a continuum of relative autonomy as considerable psychometric evidence supports. More importantly, the greater the relative autonomy of one's behaviors the more likely the person is to persist in the face of obstacles, to perform better, and to have a positive experience in relation to the activity (see Deci & Ryan, 2000; Ryan & Deci, 2006). Scales assessing the continuum of motives are available in most domains including those

associated with physical activities and health behaviors such as sport (e.g., Pelletier, Vallerand, & Sarrazin, 2007), exercise (e.g., Mullen, Markland, & Ingledew, 1997; Wilson, Rodgers, & Fraser, 2002; Wininger, 2007), tobacco (e.g., Levesque, Williams, Elliot, Pickering, Bodenhamer, & Finley, 2007), and eating behaviors (e.g., Pelletier, Dion, Slovenic-D'Angelo, & Reid, 2004) among others.

A study by Pelletier, Fortier Vallerand, and Brière (2001) is illustrative of the importance of relative autonomy in a sport context. They sampled elite swimmers, assessing both the coaching style they were experiencing and the swimmers' own motivations for participation. They then followed these swimmers for a 22-month period of time, tracing those who persisted versus dropped out of this competitive and arduous sport. These researchers found that controlling coaching environments were associated with more heteronomous forms of self-regulation, whereas autonomy-supportive coaching conduced to more autonomous (i.e., identified and intrinsic) forms of motivation. These more autonomous forms of motivation were predictive of a lower likelihood of dropout, or greater persistence over time.

In another illustrative study, Williams, Grow, Freedman, Ryan, and Deci (1996) examined motivation for engaging in treatment in a sample of morbidly obese individuals. In that study it was found that not only did those with more autonomous motivation showing higher attendance and completion rates, they also maintained their weight-loss attainments better over a two-year follow-up period.

Within SDT, the categories and subtypes of intrinsic and extrinsic motivation can be applied to all intentional actions. In fact, most intentional acts involve some combination of the varied types of regulation we have described. For example, a person may choose exercise activities that they find inherently enjoyable (i.e., intrinsic motivation) while at the same time engage in these activities for some separable outcome such as a value for their health (i.e., identified regulation). Thus in many studies these various motives are weighted and combined to reflect an overall level of relative autonomy. But, it is also important to recognize that each of the subtypes of motivation carries with it unique characteristics and consequences, and each is fostered by different antecedents. In short, the taxonomy of motives derived from SDT allows researchers both to look at both the functional impact of varied motives, and how those varied motives are configured and combined within the individual.

Amotivation

By definition all intentional acts are motivated, either intrinsically or extrinsically. Yet especially in the realm of physical activity (though also in all domains) there

are frequently cases where a person has no intention to act, which we call *amotivation*. However, like the category of extrinsic motivation, the category of amotivation is complex, and there can be different reasons why a person is amotivated. One major reason identified within SDT for being amotivated is that the person does not experience a sense of competence to carry out the activity. This could be because they lack certain skills or knowledge necessary to act. Another distinct basis for amotivation is that the person sees no connection between the action and desired outcomes. Finally, a person may not want to act. For instance, a person can be volitionally amotivated when he or she simply finds no value or interest in the activity. Because amotivation can be manifest for these different reasons, SDT highlights different interventions that may be required to motivate an individual—in some cases it may be fostering competence or efficacy, in others it may be through helping a person discover meaning or value (thus fostering internalization) or interest and enjoyment (thus fostering intrinsic motivation) in an activity.

FACILITATING MOTIVATION: THE ROLE OF BASIC PSYCHOLOGICAL NEEDS

A basic tenet of SDT is that in order to be optimally motivated and to experience wellness, a person needs to experience specific psychological needs in their activities. Indeed, the concept of needs within SDT is intended to convey that there are certain necessary or essential psychological supports for motivation and wellness (Deci & Ryan, 2000; Ryan, 1995). Specifically, in yet a third sub-theory called *basic psychological needs theory* (BPNT), SDT posits that there are three basic, universal and cross-developmental psychological needs to be considered: the need for competence, autonomy, and relatedness.

Competence and competence supports. SDT is not unique in recognizing the importance of feelings of competence or efficacy for motivated behavior. In order to act a person needs to experience some level of effectiveness and confidence. Within SDT this sense of competence can be related not only to a person's skills and history within the domain of behavior in focus, but also to aspects of the social environment. Thus, when people around the actor, be they coaches, teammates, parents or others, provide meaningful positive feedback, feelings of competence can be enhanced and therefore motivation can be increased. Conversely, when others are critical or supply ongoing negative feedback, feelings of competence diminish and a person's likelihood of becoming discouraged and disengaged is heightened.

Autonomy and autonomy support. In contrast to the wide acceptance of competence-related needs, SDT is unique in emphasizing the fundamental importance of autonomy and its support. Autonomy refers to regulation by the self. When autonomous, a person experiences his or her behavior as self-organized and endorsed. Autonomous behavior is, in the true sense, not only intentional but also volitional—one fully assents to engaging in the actions.

Autonomy is an internal state, reflecting the integrated endorsement and organization of actions. Yet the capacity to act autonomously is strongly impacted by social environments, which can vary from being controlling and coercive to supportive of autonomy self-regulation. The imposition of controlling reward or punishment contingencies may, for example, compromise the actor's autonomy, as can the presence of evaluative contingencies. In contrast, when others appreciate a person's frame of reference, this provides rationales for action, and allows or supports reflection and choice; the capacity for autonomy is facilitated, as well as the potential to satisfy other basic psychological needs. For example, Adie, Duda, and Ntoumanis (2008) recently completed a study of over 500 adult sport participants, and their results revealed that coach autonomy support predicted participants' basic need satisfaction for autonomy, competence and relatedness. In turn, basic need satisfaction predicted greater subjective vitality when engaged in sport. Those with low levels of autonomy were especially susceptible to feeling emotionally and physically drained by their engagement in sport. Moreover, these investigators showed that autonomy and competence partially mediated the relations between coach autonomy support and subjective vitality.

Relatedness and relatedness support. Finally, SDT posits that a sense of connection and belonging is essential to wellness and integrity. The concept of relatedness refers to this sense of connection with others, a sense that includes a feeling of being included and cared for by others within the domain of action. More generally, BPNT suggests that in a context of relatedness individuals are more likely to internalize ambient values and skills. Relatedness is supported by the warmth, care, and involvement others convey.

In the domain of physical activity, whether it is sport, exercise, or other forms of exertion, support for all three basic needs facilitates intrinsic motivation and internalization—thus both the enjoyment and persistence at activities is affected by need supports. Conversely, when needs are thwarted, individuals lose motivation and are less likely to maintain their active behavior in the settings where these needs are not being satisfied. For instance, Gagné, Ryan, and Bargmann (2003) found that elite female gymnasts were both more motivated and more vital following practices in which they felt relatedness, autonomy, and competence

during the practice. Indeed, as specified with CET, autonomy and competence are necessary conditions for intrinsic motivation. Moreover, all three needs play a role in the internalization process as specified within OIT. Specifically, external regulation requires minimally competence, but usually involves little autonomy or relatedness. Introjection also requires some competence, but the person may feel that to maintain relatedness (e.g., the other's approval) autonomy may be sacrificed. More integrated regulations, however, are accompanied by perceptions of both autonomy and competence, as well as a sense of inclusion and belongingness.

GOAL CONTENTS: LOOKING GOOD AND/OR BEING HEALTHY

One offshoot of BPNT is the idea that people's goal pursuits are linked with their optimal motivation and well-being only insofar as they satisfy or fulfill basic psychological needs for autonomy, competence, and relatedness. In this sense all goals are "not created equal" (Ryan, Sheldon, Kasser, & Deci, 1996).

Kasser and Ryan (1996) distinguished two classes of goals that differ in their capacity to fulfill or thwart needs satisfaction. *Intrinsic goals* or aspirations are those assumed to be inherently satisfying and to foster need fulfillment directly. Intrinsic goals include goals such as developing intimate relationships, building community, growing personally and maintaining one's health. In contrast, *extrinsic goals* are focused on outcomes that are themselves not inherently satisfying of basic needs, and instead are bases for feeling contingently regarded or worthy. Extrinsic goals include those for money and material goods, fame and popularity, and having an attractive image.

In the domain of physical activity the principle contrast between extrinsic and intrinsic goals is that between the goals of becoming healthy and fit (intrinsic) and looking good to others (extrinsic). Several studies dating back to Kasser and Ryan (1996) have shown that health goals load with other intrinsic goals in factor analyses, whereas attractiveness goals load with other extrinsic aspirations such as materialism and desire for fame (for cross-cultural confirmation of this pattern see Grouzet et al., 2005). Moreover, in line with the tenets of both BPNT and OIT sub-theories, SDT suggests that people pursuing health goals will be more persistent and experience greater well-being than those pursuing attractiveness goals.

Several studies in the area of physical activity have been examining SDT-based hypotheses regarding goal contents. For example, Chatzisarantis and Hagger (2007) examined participants in both recreational and competitive sport contexts,

and reported that athletes who placed more importance on intrinsic goals evidenced greater well-being as indicated by both hedonic and eudaimonic (see Ryan & Deci, 2001) assessments of wellness. Moreover, whereas the attainment of intrinsic goals enhanced well-being, the attainment of extrinsic goals predicted neither greater enjoyment nor wellness. Interestingly, competitive athletes tended to be more extrinsically focused than recreational sport participants. Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) did another experimental study in the context of physical education classes for 10-12th grade Belgian students and found that framing an exercise activity in terms of an intrinsic goal attainment (i.e., "This activity helps you to remain physically fit and prevents you from becoming sick at a later age") increased performance compared to extrinsic goal framing (i.e., "Doing this activity helps you to remain physically appealing to others and prevents you from gaining weight at a later age"). In a follow-up to this experiment Vansteenkiste, Matos, Lens, and Soenens (2007) found that extrinsic exercise goals were associated with an increased ego-involvement and less task involvement than goals with a more intrinsic focus. Because task and ego-involvement themselves predict both well-being and persistence, this experiment suggests the importance of goal content considerations in the domain of exercise.

Interestingly, although there is a relation between extrinsic goals and lower autonomy, the effects of relative autonomy and goal content are also to some extent independent; that is, both can contribute uniquely to outcomes (Sheldon, Ryan, Deci, & Kasser, 2004; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005). In line with these findings, SDT assumes that goal contents affect outcomes associated with well-being above and beyond the effects of motivation per se because of their association with need satisfaction. This bespeaks the import of fostering more intrinsic goals foci in the context of physical activities.

THE THEORY OF VITALITY

A topic closely related to physical activity is that of energy. Within the framework of SDT a specific theory of subjective energy has emerged, addressing both what enhances and depletes it (see Ryan & Deci, 2008). The theory defines *vitality* as energy available to the self, and distinguishes vitality from other forms of activation and arousal (Ryan & Frederick, 1997). In addition, it specifies that subjective energy is not simply a function of rest versus fatigue or caloric energy, but in fact is heavily affected by psychological factors. Specifically, SDT argues that need thwarting events diminish energy, and need satisfactions maintain or enhance it.

Both experimental and field studies have supported a number of these claims (e.g., Moller, Deci, & Ryan, 2006; Muraven, Gagné, & Rosman, 2008; Muraven, Rosman, & Gagné, 2007; Nix, Ryan, Manly, & Deci, 1999).

Ryan, Weinstein, et al. (2008) recently reported a series of experimental and survey-based studies that attests to another factor associated with vitality—*contact with nature*. They found that when people were outdoors and particularly in environments containing natural elements such as plants, trees and water, they reported enhanced energy, even controlling for factors such as level of physical exertion and social interaction. At this point the reasons why nature vitalizes can only be speculatively understood, but it seems that connectedness with living things brings us energy, supporting many longstanding claims of outdoor activity enthusiasts.

INTERVENTION RESEARCH

SDT has increasingly become a basis for interventions in the areas of health-promotion and physical activity. The SDT model of health behavior change (Ryan, Patrick, Deci, & Williams, 2008; Williams, 2002) suggests that an individual's motivation to change in a direction of health is heavily influenced by experiences of autonomy, competence, and relatedness in both the initiation and maintenance phases of the change process. Autonomy-supportive approaches help people to identify self-endorsed goals and health care climates that support need-satisfaction promote internalization. These approaches and climates thereby enhance the maintenance of goal-related behavior changes. The initiation and maintenance of behavior change is also affected by the relative predominance of intrinsic versus extrinsic life goals, which impact lifestyle and value priorities, highlighting such goals as a target of reflective discussion. This general model has been supported in studies of dietary change, weight loss, reductions in smoking, and physical exercise, among other targets.

Numerous field studies, some of which have already been described, have shown that supports for autonomy and competence enhance internalization and thus maintained change (Ryan et al., 2008). For example, practitioner autonomy support has been linked not only with greater engagement in the treatment phase of weight loss for obese individuals, but also with the internalization of treatment goals and thus greater maintenance over time (Williams et al., 1996). Similarly, Edmunds, Ntoumanis, and Duda (2008) recently tested an SDT intervention concerning autonomy-support for exercise and showed how it predicted more autonomous self-regulation, greater need satisfaction, and higher attendance.

There is also a growing number of randomized clinical trials testing the efficacy of SDT-based interventions. These clinical trials include treatments concerning tobacco dependence (Williams et al., 2006), physical activity (Fortier, Sweet, O'Sullivan, & Williams, 2007), and dental hygiene (Münster-Halvari & Halvari, 2006), among others. Collectively these interventions have been shown to facilitate autonomous self-regulation and competence, and thereby promote more lasting positive treatment outcomes (Patrick et al., 2007).

SUMMARY

This brief overview of SDT suggests support for a number of principles that have broad implications for persons promoting physical activity, and include the following:

1. Physical activity can be intrinsically motivated, and to the extent it is more easily maintained over time.

2. Intrinsic motivation for physical activities is facilitated by supports for autonomy and competence. In this regard coaches, parents, and health practitioners can undermine physical activity by being pressuring or controlling; they can promote intrinsic motivation through autonomy support and positive, effectance relevant feedback.

3. Physical activities are often extrinsically motivated, but these extrinsic motives vary in their relative autonomy. The more extrinsic motives are internalized and integrated, the more autonomous they are and this in turn predicts both positive experience and better maintenance.

4. Internalization and integration of motivation for physical activities is fostered by support for all three basic needs—that is, by supports for relatedness, competence, and autonomy.

5. Athletes and exercisers differ in the content of their goals, with some more focused on intrinsic aspirations (e.g., health, growth) and others more on extrinsic aspirations (e.g., appearance, recognition).

6. Intrinsic aspirations are associated with greater well-being and task involvement; extrinsic aspirations are not associated with positive outcomes, even when attained.

7. Coaches, parents, and health care practitioners can foster greater need satisfaction and self-determined motivation through being autonomy supportive and by framing goals in more intrinsic terms.

8. Physical activity is associated with greater vitality, but only when

autonomously motivated. SDT further postulates that in addition to factors of nutrition and fatigue, vitality is affected positively by basic psychological need satisfaction, and diminished by need thwarting. In addition, natural environments appear to engender energy, though the processes through which that all occurs are not yet detailed.

9. Clinical interventions focused on motivating change are effective through their support of patients' autonomy and competence in the process of change, fostering greater internalization and maintenance of behavior change over time.

THE PRESENT SPECIAL ISSUE

It is a special honor to be introducing this special issue on SDT in the domain of physical activity. In part this is because the empirical work presented herein attests to the principles articulated above, and in many ways extends them. Vazou-Ekkekakis and Ekkekakis showed how the decrements in autonomy associated with externally imposed goals can negatively impact exercise enjoyment and vitality. Julien, Guay, Senecal, and Poitras further show not only the importance of self-determined motivation for ameliorating distress, but also the degree to which this association is domain specific. Markland investigates perceived body size and discrepancies from one's ideals, showing how these influence autonomous motivation for activity. Two other studies in this volume focus specifically on basic psychological need satisfaction. Wilson, Mack, Blanchard, and Gray's investigation supports the contention that fulfilling basic psychological needs promotes optimal affective experiences in exercise settings. Vlachopoulos and Karavani demonstrate the mediating role of basic psychological needs in the relations between perceived autonomy support and subjective vitality within a sample of Greek-speaking exercisers. Finally, Fortier and Farrell use a more qualitative approach to examine both regulatory styles and goal contents within a small sample that includes both excessive and healthy exercisers. Thus each of the articles in this special issue employs a different subset of SDT constructs in their explorations of physical activity, reflecting both the diversity and multiple applications of the framework.

These contributions are illustrative of the growing amount of basic and applied research spawned by SDT within the domains of health, physical activity and sport. The vigorous tradition of SDT research in these areas thus continues to grow and inform the practice of health care providers, coaches, and all those trying to promote healthy lifestyles in the context of the increasing pressures

within this modern world that lead people away from exercising their bodies and engaging their natural surroundings. We thus hope that this volume further inspires researchers to identify the processes and mechanisms that underpin volitional physical activities and ensure their maintenance over time.

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