



Putting theory into practice : Enhancing motivation through OPTIMAL strategies

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The purpose of this paper is to propose a theoretical framework containing several strategies designed to increase motivation among children in physical activity settings by facilitating optimally challenging experiences. Optimal challenge occurs when the challenge of an activity is highly balanced with an individual's abilities to successfully perform the task. Optimal challenge is a construct at the heart of three influential contemporary theories of motivation (Csikszentmihalyi, 1990; Deci & Ryan, 1985; Harter, 1978a). When people feel optimally challenged during an activity, they are more likely to have a quality subjective experience and be intrinsically motivated to take part in the activity at that time and in the future. In this paper, theory and research regarding optimal challenge in educational and sport settings are reviewed. Finally, strategies to facilitate optimal challenge arising from prior theory and research are presented.

Cet article vise à fournir un cadre théorique qui intègre plusieurs stratégies conçues pour motiver davantage les enfants qui s'adonnent à l'activité physique en favorisant des types d'expériences qui présentent un défi optimal. On parle de défi optimal lorsqu'une personne atteint le meilleur équilibre possible entre le défi que pose une activité et l'aptitude de la personne à relever efficacement ce défi. Le défi optimal constitue le fondement de trois théories contemporaines influentes (Csikszentmihalyi, 1990 ; Deci et Ryan, 1985 ; Harter, 1978a). Quand les gens perçoivent qu'une activité quelconque constitue un défi optimal, ils tendent davantage à vivre une expérience de qualité subjective et être motivés, de façon intrinsèque, à s'adonner à cette activité au moment même et plus tard. Ce document examine les théories et la recherche axées sur le défi optimal et leur application dans des contextes éducatifs et sportifs. Il analyse également les stratégies favorables au défi optimal dont font état diverses théories et recherches antérieures.

There is a great deal of concern regarding North American children's physical inactivity. It is estimated that over half of Canadian children and youth aged 5 to 17 are not active enough for optimal growth and development with girls being less active than boys (Cragg, Cameron, Craig, & Russell, 1999). We have also seen significant decreases in school physical education (PE enrollment), especially for girls, once students are given a choice of whether or not they wish to take PE (Luepker, 1999; Spence, Mandigo, Poon, & Mummary, 2001). As well, more than 35% of American high school students do not participate in vigorous physical activity and only 49% are enrolled in a PE class (U.S.

Department of Health and Human Services, & U.S. Department Education, 2000). The importance of providing children with positive and enjoyable physical activity experiences is regarded as one of the most important considerations for keeping children active (Scanlan & Simons, 1992; Wankel, 1993). The time has now come to put forth strategies that will help make physical activity a positive and enjoyable experience for all children.

Contemporary theories of motivation advocate the importance of matching an individual's ability level with the challenge of an activity. This construct called optimal challenge is supported by three intrinsic motivation theories: Theory of Optimal Experience (Csikszentmihalyi, 1975; 1990); Cognitive Evaluation Theory (Deci, 1975; Deci & Ryan, 1985); and Competence Motivation Theory (Harter, 1978a). According to each of these theories, humans have an intrinsic desire to seek out and participate in optimally challenging activities that foster their self-development (see Figure 1). A person is optimally challenged when the challenge of an activity is highly balanced with the individual's abilities to successfully perform the task (Csikszentmihalyi, 1990). Although all three of these theories put forth their own unique framework for understanding intrinsic motivation, they share a common element related to optimal challenge and therefore each contribute to a better understanding of this construct. All three of these theories suggest that when individuals are successful at an optimally challenging activity (i.e., not too easy, not too hard), their competence is enhanced. As a result, participants are more likely to have a quality subjective experience and be intrinsically motivated to take part in the activity at that time and in the future (Reeve, 1996). However, if exposed to continuous imbalances (i.e., skill does not equal challenge), participants can become frustrated or bored which may eventually lead to their withdrawal from the activity (Csikszentmihalyi, 1975, 1990).

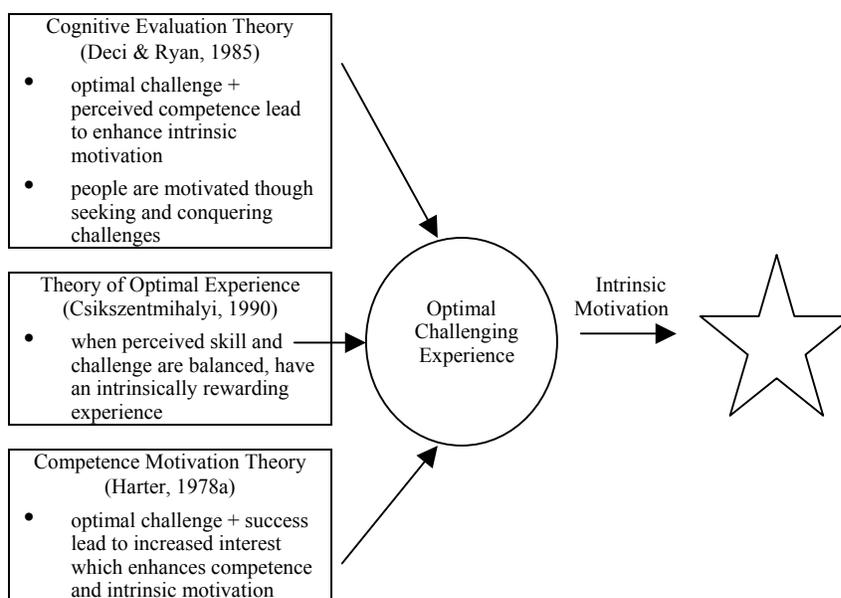


Figure 1. Theoretical support for the construct of optimal challenge and its influence on intrinsic motivation.

School PE programs currently stress the importance of matching the challenges of an activity with a child's developmental abilities to maximise success and skill development

(e.g., Chepko & Arnold, 2000; Weiss & Bressan, 1985). Despite the theoretical underpinnings that have been developed within the area of motivation and the importance of understanding optimal challenge in structuring developmentally appropriate physical activity environments, there are currently no research-based interventions available to promote optimal challenge in physical activity settings. The purpose of this article is to propose a framework that will facilitate children's optimal challenge experiences in physical activity settings. Physical activity instructors (e.g., recreation programmers, teachers) may use this framework to enhance children's intrinsic motivation, and the framework also provides a theoretical grounding for future research in this area.

An OPTIMAL Framework to Promote Optimal Challenge

The creation of developmentally appropriate practices that provide clear guidance for instructors and are based in theory and research is an important direction in pediatric sport and educational psychology. Based on contemporary motivational theoretical perspectives and existing research, we present strategies that could be used to increase children's opportunities to engage in optimally challenging activities. Although the strategies are designed to be used in any physical activity environment (e.g., PE, organized sport), they are geared primarily to researchers and practitioners who work with children in non-elite sport environments which contain heterogeneous groups in terms of ability, interest, and experience. The strategies proposed here are based on an acronym we have called 'OPTIMAL' (see Figure 2). Adopting an interactionist approach (Treasure, 2001), situational factors are considered in conjunction with dispositional factors to facilitate optimally challenging experiences which result in higher levels of intrinsic motivation. Situational factors are related to aspects of the environment that can be manipulated (e.g., teaching styles, types of tasks) while dispositional factors reflect individuals' behavioral or trait characteristics (e.g., goal orientation, cognitive abilities).

O	pportunities for success <i>(e.g., self-competitive goals)</i>
P	erceptions of choice <i>(e.g., allow participants choice during activities; student created activities, open-ended tasks)</i>
T	ask mastery <i>(e.g., TARGET principles that emphasize task mastery over competition)</i>
I	nclusion teaching style <i>(e.g., allow students to choose their own entry level of task difficulty)</i>
M	otivate through intrinsic elements <i>(e.g., self-assessment strategies; less pressure on evaluative components; avoid using rewards to control behavior; constructive and informative feedback)</i>
A	ilities awareness <i>(e.g., provide for a variety of skill levels in class; take into consideration the "whole" child's developmental capabilities and needs)</i>
L	ike to do it <i>(e.g., ask children to indicate the type of activities they like to do; set realistic goals)</i>

Figure 2. Strategies to foster OPTIMAL challenge environments

Opportunities for success. Couched within Harter's (1978a) Competence Motivation Theory, success at optimally challenging tasks serve to enhance perceived competence, which in-turn, enhances intrinsic motivation. This desire to enhance perceptions of competence motivates individuals to seek out optimally challenging tasks (Rea, 2000;

Reeve, 1996). Boggiano, Main, and Katz (1988) found that children's self-reported perceptions of academic competence and personal control were related positively to intrinsic interest in schoolwork and preference for challenging school activities. They also reported that children with high levels of academic competence and personal control were more likely to report higher preferences for challenging activities when placed in evaluative and controlling conditions than those with low levels of academic competence and personal control. Although this study only reported academic competence as opposed to physical competence, the findings indicated that children require competence in their abilities if they are to choose challenging activities in which they can be successful.

Within many physical activity environments providing opportunities for success can cause some problems when there is a winner and a loser. When winning is over-emphasized, it not only takes away from optimally challenging situations, but it can have a negative impact on a child's overall experience and sense of self (Orlick & Botterill, 1977). However, instructors can create an environment (a situational variable) that promotes success for each participant by encouraging children to set self-competitive goals that are based upon individual abilities. The goals that individuals set for themselves can be process and/or outcome oriented. For example, participants could count the number of times they are able to keep a ball in the air by striking it with a racquet. Each time, they can try to beat their own score and reflect upon the process of how they are going to keep the ball in the air for a longer period of time. They may reflect on questions such as: Should I improve my grip on the racquet? Should I keep my eye on the ball? What else can I improve on? This way, they develop effective problem-solving skills and still receive informative feedback (i.e., both outcome and process oriented) from the task even when they do not beat their score. The instructor can ask at the end of an activity: "Did you reach *your* goal?" rather than imposing an external goal that may be unattainable for some and too easy for others.

Perceptions of choice. The importance of providing children with choice (a situational variable) helps to foster a sense of autonomy and relatedness, which are critical aspects to self-determination and intrinsic motivation (Deci & Ryan, 1985). Mandigo (2001) found that when children were provided with a choice of distance from where they could aim at a stationary target, they reported significantly higher levels of optimal challenge than at any other previous distances where they were told to stand. Turner, Parkes, Cox, and Meyer (1995) found that activities that provided students with a chance to modify and have some control were more likely to produce experiences where the children felt their skills and challenge were balanced. Finally, Mandigo (2002) reported that when participants at a summer camp were allowed to choose the programs to attend, they were more likely to report higher levels of optimal challenge, enjoyment, and competence than programs they were told to attend.

To help facilitate student choice, participants can be encouraged to create their own experiences. Examples might include providing students with the opportunity to create their own games, or allowing them to create their own gymnastics routine that combines different skills and movement concepts that they feel comfortable performing. Along with allowing learners to create their own experiences, the instructor can provide choices for how those activities are performed. For example, an instructor may allow players the choice of playing a mini-lacrosse game of 2 vs 2, or 3 vs 3 and allow them to decide the area of play, size of goals and who they want to play with. Most participants will structure their field and game in a manner that is the most optimally challenging for them as long as the instructor stresses the importance of playing the game for enjoyable and competence based reasons rather than for solely competitive reasons (i.e., to win the game). Players may also choose to play with other children who have the same physical abilities as them or they may choose to play with those who have a similar understanding of the game (i.e., a cognitive characteristic) or who share common affective characteristics (e.g., values, morals, self-esteem) as them. The importance of remembering the whole child (Wall & Murray, 1994) when balancing physical, cognitive,

and affective skills with the physical, cognitive, and affective challenges afforded by physical activities is addressed in the "abilities awareness" section.

Task mastery. As the first strategy suggested, instructors can facilitate optimal challenge by creating a climate that provides opportunities for success. How a child defines success for him or herself may vary based on his or her goal orientation (a dispositional factor). Individuals who are motivated by an intrinsic desire to improve are more likely to experience optimal challenge because they choose tasks that challenge them at a level that is in line with their abilities (Sarrazin & Famose, 1999). Goal Perspectives Theory (cf. Duda, 1992) suggests such individuals are said to hold a task-mastery orientation. On the other hand, individuals who are motivated by reasons that make them look good in front of others are more likely to be ego-oriented. Sarrazin and Famose reported that an individual's goal orientation in conjunction with their perceived ability influenced choice of difficulty for a wall-climbing task. Their results suggested that optimally challenging tasks are more likely to occur when participants are task-mastery oriented as opposed to ego-oriented. If an individual is ego-oriented, they will be more likely to choose easier tasks than they are actually able to do in order to ensure success.

Instructors need to be sensitive to children's goal orientations during participation. Task-oriented children should be supported in their desire to take part in activities that foster self-improvement and the intrinsic joy of being active. Alternatively, instructors may wish to gradually encourage ego-oriented children to adopt more task-oriented goals. Tan and Thompson (1999) provided an excellent review of strategies to deliver mastery-based programs in sport and physical activity. Using the TARGET principles, they recommended that a task-mastery orientation can be fostered by: a) providing a variety of activities; b) allowing children input into the decision making; c) recognizing individual improvement and progress; d) using individual or small group activities at developmentally appropriate tasks; e) evaluating students based on improvement; and, e) allowing for sufficient time to practice and improve abilities at tasks. Based on previous evidence linking mastery-based orientations to optimal challenge, it is recommended that creating an environment that encourages self-improvement and incorporates strategies such as those identified by the TARGET principles can help to foster task-mastery orientations. By fostering such goal orientations, participants are more likely to choose activities that they feel are optimally challenging.

Inclusion teaching style. An instructor's teaching style is another situational factor that can influence a child's optimal challenge. Mosston (1992) put forth a spectrum of 11 different teaching styles which ranged from teacher dominated (i.e., command style) to learner dominated (i.e., self-teaching style). Although learners could experience optimal challenge under any one of these styles given the right circumstances, the teaching style which is likely the most influential in fostering optimal challenge is the inclusion style. The essence of the inclusion style is: "... the same task is designed for different degrees of difficulty ... Learners decide their own entry point at a task, and [decide] when to move onto another level" (p. 31).

Goldberger and Gerney (1986) reported that an inclusion teaching style resulted in significant improvements in a motor skill task, especially for those with below and above average levels of aptitude for learning motor skills. This may suggest that providing students with various levels of difficulty for the same task allows them to work at a level that is "optimal" for them. Danner and Lonky (1981) reported that when children took part in tasks that were matched to their ability level, interest level and engagement time was significantly higher. Tasks rated as either too easy or too hard were not rated as interesting as tasks that were matched according to the children's skill level. Within every class, team, or physical activity program, each participant is unique. Hence, being able to accommodate for individual differences is at the heart of dispositional factors that impact children's optimal challenge.

Inclusion teaching style can be visually perceived as a 'slanty rope' in a high-jump activity where learners chose their own entry height to jump over the rope. Educational gymnastics is a good example of how an inclusion teaching style has been utilized. Rather than asking a student to "do a head stand," an instructor might ask students to "balance on three body parts." The more skilled students may choose to start at a more advanced level by balancing on two hands and their head. The lesser skilled students may choose to balance on three body parts, which offer more stability such as a left knee, left elbow and right hand. From there, they can start to refine their movements and eventually extend their balance to make it more difficult. The role of the instructor in this style is to not only structure a supportive and appropriate environment, but also to encourage learners to challenge themselves towards more challenging tasks.

Motivate through intrinsic elements. As suggested by Deci and Ryan's (1985) Cognitive Evaluation Theory, the situational influence of rewards that serve to control behaviour will often undermine intrinsic motivation. For example, Danner and Lonky (1981) reported that when a reward was offered to children taking part in an optimally challenging task, it undermined their initial level of high intrinsic motivation. Other research has revealed that when participants felt constrained by extrinsic factors such as rewards or grades, they were less likely to choose optimally challenging tasks (Harter, 1978b; Reeve, 1996) or to spend time performing the activity (Orlick & Mosher, 1978; Ryan, Mims, & Koestner, 1983). This strategy suggests that to promote optimal challenge during participation in physical activity environments, instructors should avoid the use of rewards (e.g., trophies, prizes) and consequences (e.g., exercise as a form of punishment, low grades) to control children's behavior. Strategies that focus on the intrinsic elements of an activity are much more effective at fostering optimal challenge than activities that motivate individuals to participate for extrinsic reasons alone.

Evaluating students based upon performance outcomes often discourages them from being evaluated in conditions that are optimally challenging for them. Assessment strategies that encourage participants to choose more optimally challenging tasks could include being assessed on personal improvement or using different forms of self-evaluation. The instructor can facilitate this by focussing on increasing the learner's knowledge of performance (i.e., a process-oriented approach), rather than on outcome alone. Typically, learners can see the outcome for themselves, but expert augmented feedback may help them to understand more about how they achieved that outcome. Specifically, knowledge of performance feedback at an individual level should help foster the development of an intrinsic desire to seek out optimally challenging activities, and reduce situational constraints where the feedback or reward is being perceived as controlling rather than informational (Deci, 1995).

Abilities awareness. Practitioners must be able to identify the varying abilities of the participants in their classes/groups in order to enhance individual experiences of optimal challenge. Within physical activity settings, one often thinks of physical skills first. Although these are important, the "whole child" must be considered and hence their affective and cognitive skills must also be taken into account (Wall & Murray, 1994). Based on children's cognitive skills, children (e.g., under 8 years of age) in the pre-operational stage of development lack the ability of conservation. That is to say, they are unable to focus on more than one thing at a time (Miller, 1993). Introducing the offside rule in soccer, for example, would be a great source of anxiety for children in the pre-operational stage because they lack the ability to understand and focus on the position of the defending team and the position of the ball at the same time. Therefore, instructors must be careful not to introduce complex rules or abstract tactical solutions before children are cognitively able to understand how to implement them.

Within the affective domain, the importance of various socializing agents needs to be taken into consideration. Young children's primary socializing agents are parents. As a result, strangers or new environments may intimidate them where they are separated from familiar family members. Instructors of young children can help ease children's anxiety level by creating a physical activity that is inviting and familiar. For example, playing

familiar singing games that children know and talking to children at their own level by sitting with them can be effective ways to create an environment that takes into consideration the children's developmental level. By the time children reach adolescence, individual morals and values are being formed and the primary socializing agent is often the peer group (Harter, 1983). Therefore, creating environments that foster fair-play can be effective at developing positive sportspersonship values. Providing opportunities for positive peer interaction during adolescence can be effective strategies to create a balance between developmental skill level and the challenges and expectations afforded by physical activity environment.

Like to do it. Creating an environment where participants value what they are doing is likely to increase their sense of intrinsic motivation (Fox, 1991). If participants do not value an activity, they are less likely to put in the effort to be optimally challenged. Rea (2000) reported that students who lose interest in their talents are less likely to pursue an activity when the challenge no longer exists. Similarly, Mandigo and Couture (1996) reported that when children perceived their skills to be balanced with the challenge of the activity they were more likely to report high levels of fun. Harter (1974) found that children were happier solving harder anagrams than they were solving easier ones. However, enjoyment reached a plateau and started to decrease when the anagram length got too long and participants were no longer experiencing success (Harter, 1978b). All these studies suggest that optimal challenge is linked to enjoyment. However, it is not clear whether enjoyment leads to optimal challenge or vice versa. As such, it is important to use all of the OPTIMAL strategies to help foster enjoyment, and instructors should emphasize liking to do an activity by seeking participant input as a fundamental element of physical activity programs.

Conclusion

Further research is needed to determine the extent to which the strategies presented here have an impact on creating optimally challenging environments. Consideration must be given to the interaction that exists between situational (e.g., teaching style used in the environment) and dispositional (e.g., goal orientation, cognitive abilities) variables. Researchers are required to adopt an interactionist perspective and work closely with teachers and students to examine the effects of the OPTIMAL strategies. Such approaches will enable researchers and practitioners alike to obtain a more complete picture of how the various strategies interact with each other to facilitate optimally challenging physical activity environments.

Optimal challenge levels vary across learners and situations, therefore a general assumption underpinning our approach is to encourage learners to engage in optimally challenging activities *for themselves*. The OPTIMAL strategies presented in this paper are an attempt to combine theoretical perspectives and empirical findings with pedagogical practices in order to increase the likelihood of children having optimally challenging experiences. In doing so, it is hoped that children will be motivated to enhance their personal development and start to reap the benefits that an active lifestyle has to offer.

Authors' Notes

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