

## The role of interest in physical education: A review of research evidence

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Chen, A., & Wang, Y. (2017). The role of interest in physical education: A review of research evidence. *Journal of Teaching in Physical Education*, 36, 313-322.

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### Abstract:

This article focuses on the research on interest, especially situational interest, in physical education. Interest has been considered a powerful motivator for children and adolescents. Based on a conceptualization of individual and situational interest, a reasonable size of evidence has been accumulated showing that situational interest motivates students to engage in physical activity. The evidence also shows that situational interest may have little impact on learning achievement. It, however, can be controlled and manipulated by teachers to create a situationally interesting learning environment to enhance engagement. The lack of studies on individual interest and its development has been identified as a void in this line of research. We argue that it is necessary to strengthen the research on individual interest and its interaction with situational interest to fully understand the four-phase theoretical model of interest development in the physical activity domain (Renninger & Hidi, 2016).

**Keywords:** motivation | physical education | interest | teaching

### Article:

Interest has long been thought to be a powerful motivator in schooling. It can be observed in numerous occasions that a child is persistent in practicing a skill just taught, playing a sport tirelessly, or engaging enthusiastically in an activity never experienced before. In particular, the interest-triggered engagement seems to lead to no obvious outcomes or tangible or intangible rewards. When reflecting on the experience and/or reasons of the engagement, the child most likely cites one reason, “it is fun!” Not only can the phenomenon be observed in everyday life, but it also has been documented empirically in physical education research in the past 20 years.

As Renninger and Hidi (2016) recently articulated in their writings about interest, motivation, and engagement, interest is regarded as a powerful motivator that penetrates all human activities. Motivation that is based on and derived from interest may be an optimal form of motivation that can and will last for a long time. As a layperson concept, interest is a simple idea. It is described

as a person being absorbed by an object or an activity and devoting energy and effort to the object or the activity (Hidi & Baird, 1986). From a scholarly perspective, however, interest is a complicated, multifaceted, and multilayered construct (Renninger & Hidi, 2016). It relates to, but is different from affects such as curiosity and enjoyment (Izard, 2009); it has reciprocal relations with other motivation related constructs such as goals, values, and perceived competence (Harackiewicz, Durik, Barron, Linnenbrink, & Tauer, 2008; Hidi & Ainley, 2002); and it is layered with conceptions of individual/personal interest and situational interest (Renninger & Hidi, 2016).

Delimited within the context of physical education, the purposes of this article are to (a) summarize and clarify theoretical and conceptual articulations about the concepts of interest, (b) review and critique research findings to position interest research in the vast landscape of learner motivation in terms of its utility, and (c) propose possible directions for future research on interest. First we will discuss recent development in theoretical conceptualization of the interest constructs and the significance in elevating interest as a major construct in motivation research. Then we will review and critique the research findings from studies conducted within the context of school physical education. Finally, we will identify strands for future research on interest and its significance in the current context of physical education.

### **Theoretical Advancement for Interest Research**

Theoretical conceptualization of interest has endured a long journey. Interest has been conceptualized as static preferences and operationalized as “liking” (Browne, 1992). In research it has shared conceptualizations as curiosity (Lowenstein, 1994), enjoyment (Silvia, 2006), attitude, and sometimes values (Eccles, Fredricks, & Epstein, 2015). Much scholarly discussion for conceptual clarity in the 1990s (see Renninger, Hidi, & Krapp, 1992) has led to numerous research studies being conducted in psychology that have resulted in clear distinctions between those constructs. In these studies the researchers clearly articulated what interest is and is not for empirical work and educational practices. It is clear that interest has two strands of characteristics. One is that interest is a psychological state that “is grounded in a person’s physiological/neurological reactions to a wide range of things, including other people, objects, and tasks” (Renninger & Hidi, 2016, p. 8). The other is that interest is a content-specific and uniquely formed motivation resource “underlying how people act, feel, engage, and learn” (Renninger & Hidi, 2016, p. 8). The two strands of characteristics are intertwined and interrelated within a person. The interrelatedness allows interest to develop as a motivational drive.

### **Types of Interest**

As a motivation resource, interest can be further conceptualized as situational interest, individual interest, and topic interest. Situational interest, sometimes called interestingness, is an individual’s motivational reaction to the appealing effect of characteristics of an activity (Krapp, Hidi, & Renninger, 1992). Situational interest is a spontaneous, short-lived in time, and intensive motivation force. Its triggering can lead to immediate and strong cognitive, affective, and physical responses to a specific content/activity. The responses include heightened attention to,

intense focus on, and mostly positive affect toward the content/activity. The responses result in enhanced engagement behavior (Mitchell, 1993).

Individual interest is an enduring psychological disposition in preference of an activity or an action over others. It motivates a person to reengage in the activity/action repeatedly over time (Krapp et al., 1992). Individual interest is relatively stable, difficult to change, and can be readily reinforced when opportunities to reengage in the same activity are available. A fully developed individual interest is likely to also serve as a person's identity when the individual is becoming associated with the activity she/he is interested in (Renninger, 2009). For example, when a child has a strong individual interest in playing soccer, she/he may develop a soccer-centered identity in a physical activity environment. The co-development and reinforcement of interest and identity allows the person to describe himself/herself to peers and associate with others who share similar interest.

Topic interest is a special form of situational interest (Hidi & McLaren, 1991). It is the appealing effect of a specific topic within a content domain rather than of the content in general or of the environment in which the content is presented or embedded. Research development, however, has displayed a different conceptualization. Because topic interest can be triggered not only by environment (a topic is taught or experienced) but also by individual dispositions (a person has already developed an interest in a topic), topic interest can also be understood as a type of individual interest (Schiefele, 1996).

## Interest Development

Recent theoretical development in interest conceptualization has led to a four-phased model of interest development (Hidi & Renninger, 2006). Given the "dual-meaning" characteristic of interest (a psychological state and a motivation resource; Renninger & Hidi, 2016), interest development involves a reciprocal and recurrent interaction among the person, content, and a trigger. A trigger is something in the interaction that attracts and captures the person's attention and other cognitive functions to spark responses to the content, environment, or people that the person is interacting with (Hidi, 2000). Triggering can be self-generated and/or situational. It must be available to support the process of interest development.

Interest development includes four different phases (Hidi & Renninger, 2006). These phases are triggered situational interest (Phase 1), maintained situational interest (Phase 2), emerging individual interest (Phase 3), and well-developed individual interest (Phase 4). These phases are not linear development steps or stages because they vary in terms of character and length. As Renninger and Hidi (2016) elaborated,

..... a given phase may vary between and within individuals based on experience and temperament, among other factors. Without self-generated or environmental support for continued engagement, it is also possible for a person's interest in something to decrease or drop off altogether. (p.12)

In other words, interest in each phase can regress or diminish when necessary support for its development becomes unavailable. Thus, interest, as a psychological state, requires constant support and care.

**Phase 1.** Triggered situational interest is a development phase where the interest is triggered by a specific entity (content, topic, activity, visual effects, etc.). Triggered situational interest usually is short-lived but with strong stimulating intensity for persons who are mentally ready to be stimulated (e.g., physical education students ready to engage if an activity is perceived exciting or fun). Triggered situational interest usually does not last. The psychological state is in the “fleeting” mode, which means when the stimulus disappears, the interest may go away, although the positive emotions (enjoyment, liking) may continue.

**Phase 2.** The second phase is called maintained situational interest. Built on triggered situational interest, maintained situational interest is characterized by prolonged engagement in the content/activity. Similar to triggered situational interest, sources of maintained situational interest are from the environment rather than from within the individual. But unlike triggered situational interest, maintained situational interest leads to a continued effort to engage and learn that starts to help build a knowledge and value base associated with the content/activity from which the triggered situational interest is generated.

**Phase 3.** Emerging individual interest is the psychological disposition that drives an individual to seek reengagement in the content/activity of interest. Instead of relying on cues from the environment (e.g., content, teachers, coaches), the individual initiates the engagement independently through own value and knowledge. He/she tends to reengage in the content/activity repeatedly to satisfy his/her own questions or information/skill gap, believes the engagement leads to positive emotions, and begins to prioritize and self-regulate own behavior to enhance the experience.

**Phase 4.** The last phase is called well-developed individual interest. When an interest has become a stable and enduring disposition, it is well developed. It motivates an individual to repeatedly reengage in the content/activity not only for satisfying his/her questions or information/skill gap, but also for advancing own knowledge and value bases. Individuals with well-developed individual interest can persevere through difficulties when pursuing their engagement goals. They also tend to appreciate any suggestions and feedback that can enhance their experiences with the content/activity.

Different types of interest, as a result of interest development, function differently in terms of motivation. In education, an argument has been that interest motivates the learner to learn (Dewey, 1913). Yet, different types of interest would have different and, sometimes, unexpected effects. For example, situational interest can be manipulated to attract learners to content/tasks through enhanced engagement, while individual interest may not be readily manipulated due to its specificity and personalized nature (Hidi & Anderson, 1992). But when individual interest matches what is being learned either at the content or topic level, the power of motivation can be amplified and substantial (Hidi & Renninger, 2006). In situations where a mismatch takes place, motivation may be compromised. Research in physical education seems to support this observation where relying on individual interests to motivate students appears to be difficult,

whereas manipulating situational interest embedded in the tasks might improve learner motivation (Chen & Darst, 2001; Shen & Chen, 2006).

## Interest and Motivation

Interest motivates by activating a series of cognitive functions including attention, information processing, and working memory (Alexander & Murphy, 1998). It also motivates by leading to positive emotional responses to the content and experience (Ainley & Hidi, 2014). In the cognitive domain, interest begins to operate when an individual senses a gap in information, competence, or experience. The desire to fill the gap provokes an information-seeking (or competence-seeking, experience-seeking) drive that motivates the individual. But as all other motivation constructs, interest's motivational impact lies in the emotional outcome that is characterized by perceived potential rewards from the information seeking experience.

Generally, rewards come from two sources, extrinsic or intrinsic (Deci, 1975). Interest has been considered a strong intrinsic reward that emerges from the information seeking experiences. The emerging inquiry into the mechanisms of interest-based reward has yielded findings to directly link the rewarding sensation experienced to the release of dopamine, a neurochemical substance in the brain (Panksepp, 1998). Panksepp asserts that interest is in itself a reward and the reward is inherent in the experiences. Kang et al. (2009) used both brain imaging and behavioral data to argue that the intrinsic reward (via curiosity) and extrinsic reward (via money) impacted memory similarly.

The findings from these and other studies have revealed the importance of the nature of interests and their developmental characteristics. More importantly, these results and subsequent theoretical articulations have advanced our understanding of interest, its cognitive functions, and its motivational effects. It appears that interest-based motivational effects may be different at different developmental phases. Specifically, situational interest, especially at the triggered situational interest phase, leads to a motivation to engage (Ainley & Ainley, 2015; Shernoff, 2013), whereas individual interest results in a motivation to reengage for deepening knowledge/skill acquisition or understanding (Renninger, 1992). In all phases the learner needs support from external sources (teachers, parents, peers) and internal sources (competence, knowledge, beliefs). It is critical for the teacher to support learners to develop interest in academic content with engaging learning tasks that are novel, authentic, exploratory, collaborative, and achievable.

Although situational interest is motivating, not all types of situational interest result in meaningful achievement. *Seductive details* (Garner, Gillingham, & White, 1989) is a type of situational interest that enhances engagement with materials unrelated to the learning goal. Seductive details directs learners' attention to trivial details in the material and, consequently, distracts them from learning the core ideas crucial for achievement. This distracting effect has been observed in classroom learning (Magner, Schwonke, Alevon, Poppescu & Renkl, 2014) as well as in physical education (Shen, McCaughtry, Martin & Dillon, 2006).

## Summary

The recent theoretical developments have provided a strong conceptualization for interest research. These developments, first, have reaffirmed interest as a viable construct characterized with multiple dimensions of a psychological state and a motivation resource. Second, academic interest can be triggered by perceived or identified gaps of information or experiences to motivate the learner. With meaningful support, triggered situational interest that usually is short lived can be maintained and developed into individual interest, which forms a motivational base for reengagement (a repeated behavior). The articulation of interest development is particularly important to physical education because it suggests that situational interest can be developed into individual interest, which eventually leads to behavior change.

## **Research Findings and Implications**

In physical education, systemic research on interest based on the above theoretical articulations began in the 1990s (Chen, 1996). This research effort has moved our understanding of interest beyond likings of physical activities offered in the curriculum and has expanded our understanding of the motivational functions of interest. This research effort, however, has centered on situational interest rather than individual interest, which is the result of a belief that situational interest can be controlled and manipulated by physical educators to help enhance student learning. In this review of literature, we will focus on what we have learned about situational interest and its motivational function for learning in physical education. The research will be presented in three subsections with the findings from the studies presented in the first subsection serving to drive those being reviewed in the subsequent two subsections. The three subsections are: (a) interest as a research construct for physical education, (b) motivational effect of situational interest, and (c) relationship with learning outcomes.

### **Interest as a Research Construct for Physical Education**

The motivational function of situational interest has been documented widely in psychological research. The effort to conceptualize the interest construct for research, arguably, emerged after the recognition of its motivational power. Based on Hidi and Baird's (1986) theoretical work, Chen (1996) started a series of studies to test conceptual clarity of situational interest in physical education with a focus on its dimensionality. In an early study, Chen (1996) adopted a Q-sort method and interviews to retrospectively determine sources that motivated high school students in physical education. A major finding was that the high school students relied on different aspects of physical activities that they labeled "interesting" to help sustain the person-activity interaction. These aspects included enjoyment, challenge, and novelty. These aspects found through the Q sort and interview data seemed to be consistent with the dimensions of interest proposed by Deci (1992). In the next few studies, Chen and his colleagues (Chen, Darst, & Pangrazi, 1999; 2001) attempted to clarify the dimensional structure of the situational interest construct.

Using a multistage, multisample approach, Chen et al. (1999) tested Deci's (1992) seven dimension model in a study involving 674 middle school students. The seven dimensions assumed an interesting task functioning at the (a) mental disposition level (exploration intention, desire arousal, and time alteration dimensions), (b) activation level (novelty and challenge dimensions), and (c) interactive experience level (attention demand and sense of delight

dimensions). The researchers measured situational interest in contrasting perceptual tasks (viewing videotaped physical activities) and experiential tasks (doing physical activities) using a four stage data collection sequence. The results yielded a five dimensional construct of situational interest including novelty, challenge, exploration intention, attention demand, and instant enjoyment (Chen et al., 1999). Using similar contrasting tasks with two additional samples, Chen et al. (2001) verified the five dimension construct and further found that novelty, challenge, exploration intention, and attention demand dimensions relied on the instant enjoyment to function as triggers of situational interest in physical activity.

The findings from the research conducted by Chen and colleagues (1999, 2001) served to create the theoretical foundation for future studies in physical education. They demonstrated that situational interest is observable in physical education and is characterized by at least five dimensional sources embedded in physical activity tasks. In addition, the findings revealed the critical role of instant enjoyment in triggering situational interest.

The identification of the five dimensions of situational interest led to a central question that seems to have anchored the research on interest: to what extent could physical education teachers elicit students' situational interest by manipulating the dimensional sources or factors? Using a repeated measures design, Chen and Darst (2001) had teachers manipulate cognitive and physical demands in tasks often used in physical education to determine whether situational interest could be elicited in students. Middle school students ( $N = 242$ ) experienced four basketball tasks with various combinations of cognitive and physical demands. Individual interest, physical skills in basketball, gender, and grade were controlled as moderating variables. Situational interest was measured immediately after students experienced each task. The measurement sequence was controlled with a counter-balanced design to minimize possible sequence effect which could confound the results of situational interest measures.

The findings revealed that the manipulation of task design had a profound main effect on the variability of situational interest measures (Chen & Darst, 2001). Tasks with high cognitive demand were perceived of high situational interest by the students regardless of the physical demand. In other words, physical activity tasks with high cognitive information or stimuli were more likely to be perceived as situationally interesting than those with low cognitive information. The findings also suggested that high situational interest is less likely to change due to individual interest, physical skill levels, gender, or grade in school.

## Summary

The findings from the studies presented in this subsection serve to set the stage for further research on interest, especially situational interest. The results demonstrate situational interest to be a research construct that is observable and measurable in physical education settings. It is a multidimensional construct that evolves from appealing characteristics of an activity and is characterized by at least five dimensional components common in physical activities. The relationship among these dimensions could be complicated, but instant enjoyment seems to be *the* very component responsible for triggering situational interest. It is critically important to note

that situational interest can be elicited by physical educators through emphasizing cognitive elements in physical activity tasks.

***Motivational Effect of Situational Interest.*** Motivation is manifested through behavior that displays strong energy toward accomplishing a goal of the behavior. In other words, motivation is inferred by the extent to which an individual is engaged in an activity or task. In the study of interest, engagement is considered a stronger indicator of motivation than other measures. While motivation from individual interest is characterized by repeated, voluntary, independent, and knowingly engagement in an activity, motivation from situational interest is characterized by spontaneous yet intensive engagement (Renninger & Hidi, 2016).

In physical education, engagement is often operationalized as the physical activity levels that students display in lessons. A few measures have been used as primary indicators of engagement in research on interest. They include steps and heart rate measured using pedometers and heart rate monitors (e.g., Chen & Shen, 2004; Shen, Chen, Tolley, & Scrabis, 2003) and vector magnitude and caloric expenditures measured using accelerometers (e.g., Ding, Sun, & Chen, 2013).

Interest is conceptualized as an important resource for motivation (Renninger & Hidi, 2016). It is therefore expected to assume that interest, especially situational interest, leads to motivated learning behaviors. In a study of the motivational effect of situational interest, Shen et al. (2003) collected data from 57 middle school students on individual interest, situational interest, physical activity (steps), and learning outcomes (skill and knowledge) during a four-week dance unit. A strong association ( $r = .69$ ) was found between situational interest and steps for both boys ( $r = .69$ ) as well as girls ( $r = .73$ ). The almost identical level of association is particularly meaningful suggesting that both boys and girls can be motivated by situational interest.

Learner motivation is thought to be mediated by specific content that students experience in the classroom (Bong, 2001). In physical education, the content variety seems to mediate the relationship between situational interest and engagement measures. In two different studies, Shen and his colleagues observed this relationship in a volleyball unit (Shen & Chen, 2006) and a softball unit (Shen, Chen, & Guan, 2007). Data were collected from 91 middle school students for the volleyball unit and 177 for the softball unit. Correlational analyses revealed correlation coefficients of  $r = .48$  and  $r = .05$  for volleyball and softball, respectively. Both are far below what was observed in the aforementioned dance study (Shen et al., 2003). The different strength of association observed in different physical education content areas provided initial evidence that supported the motivation content specificity hypothesis.

The content specificity phenomenon was once again observed and articulated in another study on middle school students' motivation in physical education. Over a school year, Ding et al. (2013) measured situational interest, engagement, physical activity levels, and learning achievement in 346 students randomly sampled from eight middle schools in Shanghai, China. Although the overall correlation coefficient between situational interest (directly measured as total situational interest) and caloric expenditure (converted from vector magnitude from RT3 accelerometers) was  $r = .77$ , the structural equation modeling yielded a much lower coefficient of .15 between situational interest (measured as a latent variable) and engagement. This indicates a high



variability of the relationship resulting from moderating effects of other factors such as skill and knowledge on engagement. However, among all measures of motivation sources, including individual interest, attainment value, intrinsic value, and utility value, situational interest was found to be the only motivation source contributing to physical activity engagement.

Recent studies on situational interest in active games (or exergames) provided additional evidence supporting the effect of specific content on students' situational interest. Sun (2012) used a counter-balanced experimental design to identify the difference in situational interest between an exergaming unit and a conventional fitness unit in elementary school physical education. The results clearly demonstrated a higher situational interest from the exergaming unit than that from the conventional fitness unit. In another study on the relationship between situational interest and an active-game based science unit, Sun and Gao (2016) provided evidence showing low to moderate correlation between situational interest dimensions and physical activity levels measured by heart rate ( $r$  ranged from .12 to .44). This finding indicates that when the activities are derived from a classroom-based content (i.e., science), the relationship might become unstable. This may be due to the low variability in the amount of physical activity experienced.

It appears that the association between situational interest and physical activity level is likely to taper off with increased mastery of a skill or knowledge, or possibly with decreased appealing effect of situational interest due to long exposure to the activity. In such instances, however, the situational interest in the activity tends to become weaker, while the activity levels remain constant. For example, in a follow-up study on exergames and situational interest, Sun (2013) showed that the relationship between situational interest and physical activity level began to drop when children had mastered the games. A similar low correlation between situational interest dimensions and physical activity level was also observed in Huang and Gao's study (2013) on playing Dance, Dance, Revolution games. In a study on physical activity and wearable technology to promote and support adolescents' diet and physical activity behavior change, Chen et al. (2014) found similar results. Situational interest measures from 90 middle school students began to taper off after one week in the intervention. But the researchers also reported a positive relationship between situational interest and targeted behavior change (days using diet journal and time using wearable technology to track physical activity,  $r$  ranged from .43 to .71). The findings appear to suggest that although the level of situational interest tapered off over time, its motivational effect on the target behaviors remained constant throughout.

In some studies researchers also examined the extent to which situational interest could vary in terms of gender and skill levels, the two variables that impact motivation in physical education. Chen and Darst (2002) found that gender was not a factor determining students' motivational responses to situational interest; however, skill level was. In dance activities, Shen et al. (2003) showed additional evidence to support this observation. In a more recent study, Sun (2013) confirmed these findings with situational interest measured in an exergaming unit in elementary schools.

Summary

The research findings reiterate and support what we observe in physical education. That is, situational interest does motivate physical education students to engage physically in the learning process. The effect can be observed and recorded in physical activity levels using different devices including heart rate monitors, pedometers, and accelerometers. The motivation effect, as a whole, may be dependent on the content; thus interest-based motivation is content specific. The effect, when recorded within a content domain, is less likely to be affected by gender. Studies on the mediating effect of skill level on situational interest motivation are scarce. Results from one study (Chen & Darst, 2002) indicated that students with higher levels of skill ability were more likely to be triggered by situational interest in content that matched their skill level. More studies must be conducted to provide further evidence to support or perhaps refute what we now know about this relationship.

***Relationship With Learning Outcome.*** At the center of motivation research, regardless of the frameworks, lies the issue of learning. It is assumed that motivation leads to adaptive learning behaviors in the classroom and gymnasium. In turn, the adaptive behavior will eventually lead to enhanced acquisition of knowledge, skills, and desired behavior change. In the case of motivation research in physical education, this assumption has yet to be verified. Chen, Chen, and Zhu (2012) conducted a meta-analysis on motivation research in K-12 physical education based on the results of 79 research articles. They found that only a few studies included pedagogical variables and even fewer (29 articles) included student learning variables such as achievement measures. The relationship between motivation measures and competence-based achievement measures (knowledge and skills) appears to be weak (correlation effect size = .20,  $p < .05$ ). These findings seem to echo what Chen and Ennis (2009) argued earlier that a primary reason that the relationship was not as salient as it should be is because not all motivation studies were conducted in a learning-oriented physical education setting. In other words, most studies were probably conducted in a recreational physical education setting where competence-based learning goals were absent. The results seem to caution researcher to avoid the pitfall of assuming all physical education settings to be suitable for studying the relationship between motivation and learning.

Studies on the relationship between situational interest and learning achievement seem to provide similar results. In physical education, competence-based learning achievement is conceptualized in two ways, as physical activity from which individual students receive health benefits, and as acquisition of knowledge and skills from which students acquire necessary scientific knowledge and physical skills for a healthful and active life (Chen & Ennis, 2004). As the evidence shown in Chen and Ennis' (2004) review, situational interest has been observed repeatedly having a sound relationship with physical activity engagement. Its relationship with knowledge and skill acquisition, however, seems to resemble the weak relationship observed between other motivation constructs and learning achievement in physical education (Chen et al., 2012).

For example, in Shen et al.'s study (2003) in a dance unit, situational interest was found to have a nonsignificant weak correlation ( $r = .24, p > .05$ ) with achievement. In another study, Shen and Chen (2006) reported that situational interest was related to learning strategies that students adopted to guide their learning behavior. But again, the relationship of situational interest to knowledge/skill achievement was weak and insignificant (path coefficient = .16,  $p > .05$ ). Situational interest, however, was found in these and another study (Shen et al., 2007) to

strengthen the link between individual interest and learning achievement. Students coming into physical education with individual interest in the content learned better when the content/tasks are situationally interesting compared with those who did not have individual interest in the content. These findings were confirmed in a largescale study (Zhu et al., 2009) involving 670 third-grade students from a random sample of 13 elementary schools. The respective path coefficients between situational interest and workbook performance and between situational interest and learning achievement scores were .06 and .08, suggesting rather weak links. But situational interest was found to be a factor that engaged the learners in both cognitive and physical learning processes.

Studies on seductive details, a type of situational interest, are scarce in physical education. Seductive details cannot be overlooked if learning knowledge and skills is a primary goal of physical education. Shen et al. (2006) examined the effect of seductive details on a sample of 240 middle school students who were learning net games. A video lesson featuring “outfox your opponent” was used as a stimulus to motivate students to learn. The video lesson was a fun episode that was interesting, but it included little substance that students could use to enhance their learning. In the assessment involving a problem-solving task, the students in the experimental condition (with the “outfox your opponent”) performed inferior to those in the control condition (without the “outfox your opponent”) significantly. This finding clarified that the relevance of situational interest may rely on the substance embedded in the situational elements constituting the situational interest.

## Summary

Situational interest certainly is a strong motivator in physical education. Its importance, as shown in current research findings, lies in its immediate effect on engagement rather than the tangible learning outcomes produced. The immediate motivation effect on engagement can turn out to be productive for learning achievement when situational interest effect is supported by students’ individual interest in and prior knowledge about the content and/or tasks. The findings substantiate the claim that situational interest is short-lived, having a strong impact at the time of person-activity interaction, rather than long-lived, having a lasting impact long enough to produce tangible achievement. Caution must be taken seriously against seductive details. Not all “fun” elements or activities in physical education are of positive situational interest. Seductive details can interfere with learning processes to have an adversarial impact on learning achievement. Given the nature of situational interest and its relationship with engagement, physical educators are encouraged to exercise prudent judgment when choosing activities/tasks to increase situational interest (rather than seductive details) that will in turn enhance engagement.

## Future Directions

Interest is a reward in itself. It is where intrinsic motivation begins. Recent theoretical development in interestbased motivation (Renninger & Hidi, 2016) points to the pressing issue of helping children develop and sustain interest to learn. As depicted in the first section of this article, a four-stage model has been proposed as a framework for interest development based on a synthesis of literature from research in classroom education (Hidi & Renninger, 2006). This

framework can be used to guide future research on interest development and is relevant for the study of the relationship between interest and physical activity behavior change.

From an educational perspective, Chen (2015) argues that motivation, including interest-based motivation, is an acquired entity rather than a pure mental disposition. The acquisition of motivation toward an activity relies on the environment where the person-activity interaction takes place. For children, a result or product of this interaction is the perception of interest, either situational or individual. It is then important for us to understand the relationship among and continuation of the interest development stages so as to trigger strong situational interest in physical activities that will gradually lead to maintained situational interest, emerging individual interest, and, eventually, well-developed (sustained) individual interest.

To better understand the transition from situational interest to individual interest, more research needs to be conducted on individual interest. Currently, we have accumulated evidence about situational interest, its motivational functions, and its relationship to learning achievement. But we have little evidence about individual interest and its development. Garn, Cothran, and Jenkins' (2011) qualitative analysis of middle school students' individual interests in physical education may serve as a foundation upon which more studies can be built. An important finding from this study is that perceived competence may be as essential as actual competence to developing individual interest. In an implicit way, this finding supports those previously identified specific to situational interest. Taken together, these findings beg researchers to study situationally interesting environments based on content/task relevant elements (Chen & Darst, 2001) rather than on seductive details (Shen et al., 2006).

Related to the above argument is a need for studies that will provide conceptual clarity in terms of the relationship between situational and individual interest. Research evidence reviewed above seems to indicate that situational interest is characterized by a general appeal that can draw enough attention to an activity/task for participants to become engaged. Individual interest, on the other hand, is always conceptualized as content-specific. Its very existence depends on an individual's knowledge and values associated with the content; in other words, it is domain specific (Alexander & Murphy, 1998; Renninger, 2000). Specific understanding about the mechanisms of transitioning triggered or maintained situational interest into emerging or sustained individual interest in sport and/or physical activity can help us develop viable curricular actions to assist children and adolescents to change their sedentary behaviors.

Interest is but one motivation construct. In learning, many of these constructs (e.g., achievement goal orientation, perceived competence, expectancy for success, subjective task values, and basic psychological needs) are at work interacting with or against each other. Motivation in physical education as a mental process can be influenced by an integrated force generated from a combination of the motivation sources. Findings from Garn et al. (2011) have shown the interaction between perceived competence and interest. Additional studies are needed for us to understand the motivation process from a multifaceted perspective.

Last but not least, we need to study interest and its impact from a global and multicultural perspective. Physical inactivity is one of several factors that have helped to gradually erode population health across the world (World Health Organization, 2010). Interest in physical

activity, as a mental state relying on the immediate environment, is no doubt rooted and influenced by the social and cultural environment in which a child is growing up. Although a few studies were conducted in countries outside North America recently (e.g., in China—Ding et al., 2013; in France—Roure, Pasco, Pope, & Gao, 2015; Roure & Pasco, in press), they primarily mirrored the studies conducted in the U.S. and did not address the issue of cultural influence on interest in physical activity. Studying interest globally will contribute to the field immensely in that the findings can help determine cultural universality and uniqueness of interest and its function in motivating children/adolescents in addressing the global issue of physical inactivity.

## Conclusion

Interest is an important motivation construct. It holds a unique place especially in motivating children and adolescents to engage in physical activity. Previous studies have explored and yielded useful evidence about situational interest regarding its sources, motivational function, and relationship with learning in physical education. In this research effort, however, individual interest has rarely been studied and we do not know much about its development although we can assume its motivational power. Recent theoretical development challenges us to further study interest from a developmental framework to explore possibilities to help children develop sustained interest in physical activity in and outside of physical education.

## References

- Ainley, M., & Ainley, J. (2015). Early science learning experiences: Triggered and maintained interest. In K.A. Renninger, M. Nieswandt, & S. Hidi (Eds.), *Interest in mathematics and science learning* (pp. 17–31). Washington, DC: American Educational Research Association. doi:10.3102/978-0-935302-42-4\_1
- Ainley, M., & Hidi, S. (2014). Interest and enjoyment. In R. Pekrun & L. Linnenbrink-Garcia (Eds.), *The international handbook of emotions in education* (pp. 205–227). New York, NY: Taylor & Francis.
- Alexander, P.A., & Murphy, P.K. (1998). Profiling the differences in students' knowledge, interest, and strategic processing. *Journal of Educational Psychology, 90*, 435–447. doi:10.1037/0022-0663.90.3.435
- Browne, J. (1992). Reasons for the selection or nonselection of physical education studies by year 12 girls. *Journal of Teaching in Physical Education, 11*, 402–410. doi:10.1123/jtpe.11.4.402
- Bong, M. (2001). Between- and within-domain relations of academic motivation among middle and high school students: Self-efficacy, task-value, and achievement goals. *Journal of Educational Psychology, 93*, 23–34. doi:10.1037/0022-0663.93.1.23
- Chen, A. (1996). Student interest in activities in a secondary physical education curriculum: An analysis of student subjectivity. *Research Quarterly for Exercise and Sport, 67*, 424–432. doi:10.1080/02701367.1996.10607974

- Chen, A. (2015). Operationalizing physical literacy for learners: Embodying the motivation to move. *Journal of Sport and Health Science*, 4, 125–131. doi:10.1016/j.jshs.2015.03.005
- Chen, A., & Darst, P.W. (2001). Situational interest in physical education: A function of learning task design. *Research Quarterly for Exercise and Sport*, 72, 150–164. doi:10.1080/02701367.2001.10608945
- Chen, A., & Darst, P.W. (2002). Individual and situational interest: The role of gender and skill. *Contemporary Educational Psychology*, 27, 250–269. doi:10.1006/ceps.2001.1093
- Chen, A., Darst, P.W., & Pangrazi, R.P. (1999). What constitutes situational interest? Validating a construct in physical education. *Measurement in Physical Education and Exercise Science*, 3, 157–180. doi:10.1207/s15327841mpee0303\_3
- Chen, A., Darst, P.W., & Pangrazi, R.P. (2001). An examination of situational interest and its sources in physical education. *The British Journal of Educational Psychology*, 71, 383–400. doi:10.1348/000709901158578
- Chen, A., & Ennis, C.D. (2004). Searching for optimal motivators: Goals, interests, and learning in physical education. *The Journal of Educational Research*, 97, 329–338. doi:10.3200/JOER.97.6.329-339
- Chen, A., & Ennis, C.D. (2009). Motivation and achievement in physical education. In K. Wentzel & A. Wigfield (Eds.), *Handbook of Motivation at School*, Chapter 25 (pp. 553–574). New York, NY: Routledge.
- Chen, A., & Shen, B. (2004). A web of achieving in physical education: Goals, interest, outside-school activity and learning. *Learning and Individual Differences*, 14, 169–182. doi:10.1016/j.lindif.2004.02.003
- Chen, S., Chen, A., & Zhu, X. (2012). Are K-12 students motivated in physical education? A meta analysis. *Research Quarterly for Exercise and Sport*, 83, 36–48. doi:10.1080/02701367.2012.10599823
- Chen, S., Zhu, X., Welk, G.J., Kim, Y., Lee, J., & Meier, N. (2014). Using sensewear armband and diet journal to promote adolescents' energy balance knowledge and motivation. *Journal of Sport and Health Science*, 3, 326–332. doi:10.1016/j.jshs.2013.07.003
- Deci, E.L. (1975). *Intrinsic motivation*. New York, NY: Plenum Press. doi:10.1007/978-1-4613-4446-9
- Deci, E.L. (1992). The relation of interest to the motivation of behavior: A self-determination theory perspective. In K.A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 43–69). Hillsdale, NJ: LEA.

- Dewey, J. (1913). *Interest and effort in education*. New York, NY: Houghton Mifflin.  
doi:10.1037/14633-000
- Ding, H., Sun, H., & Chen, A. (2013). Expectancy-value and situational interest motivation specificity on engagement and achievement outcomes in physical education. *Journal of Teaching in Physical Education*, 32, 253–269. doi:10.1123/jtpe.32.3.253
- Eccles, J.S., Fredricks, J.A., & Epstein, A. (2015). Understanding well-developed interests and activity commitment. In K.A. Renninger, M. Mieswandt, & S. Hidi (Eds.), *Interest in Mathematics and Science Learning* (pp. 315–330). Washington, DC: American Educational Research Association. doi:10.3102/978-0-935302-42-4\_18
- Garn, A.C., Cothran, D.J., & Jenkins, J.M. (2011). A qualitative analysis of individual interest in middle school physical education: Perspectives of early-adolescents. *Physical Education and Sport Pedagogy*, 16, 223–236. doi:10.1080/17408989.2010.532783
- Garner, R., Gillingham, M.G., & White, C.S. (1989). Effects of “seductive details” on macroprocessing and microprocessing in adults and children. *Cognition and Instruction*, 6(1), 41–57. doi:10.1207/s1532690xci0601\_2
- Harackiewicz, J.M., Durik, A.M., Barron, K.E., Linnenbrink, L., & Tauer, J.M. (2008). The role of achievement goals in the development of interest: Reciprocal relations between achievement goals, interest, and performance. *Journal of Educational Psychology*, 100, 105–122. doi:10.1037/0022-0663.100.1.105
- Hidi, S. (2000). An interest researcher’s perspective: The effects of intrinsic and extrinsic factors on motivation. In C. Sansone & J.M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 309–339). San Diego, CA: Academic Press. doi:10.1016/B978-012619070-0/50033-7
- Hidi, S., & Ainley, M. (2002). Interest and adolescence. In M. Pajares & T. Urda (Eds.), *Adolescence and education* (Vol. 2, pp. 247–275). Greenwich, CT: IAP.
- Hidi, S., & Anderson, V. (1992). Situational interest and its impact on reading and expository writing. In K.A. Renninger, S. Hidi, & A. Krapp (Eds.), *The Role of interest in learning and development* (pp. 215–238). Hillsdale, NJ: Erlbaum.
- Hidi, S., & Baird, W. (1986). Interestingness - A neglected variable in discourse processing. *Cognitive Science*, 10, 179–194.
- Hidi, S., & McLaren, J. (1991). Motivational factors and writing: The role of topic interestingness. *European Journal of Psychology of Education*, 6(2), 187–197. doi:10.1007/BF03191937
- Hidi, S., & Renninger, K.A. (2006). The four-phase model of interest development. *Educational Psychologist*, 41(2), 111–127. doi:10.1207/s15326985ep4102\_4

- Huang, C., & Gao, Z. (2013). Associations between students' situational interest, mastery experiences, and physical activity levels in an interactive dance game. *Psychology Health and Medicine, 18*, 233–241. doi:10.1080/13548506.2012.712703
- Izard, C.E. (2009). Emotion theory and research: Highlights, unanswered questions, and emerging issues. *Annual Review of Psychology, 60*, 1–25. doi:10.1146/annurev.psych.60.110707.163539
- Kang, M.J., Hsu, M., Krajbich, I.M., Loewenstein, G., McClure, M., Wang, J.T., & Camerer, C.F. (2009). The wick in the candle of learning: Epistemic curiosity activates reward circuitry and enhances memory. *Psychological Science, 20*, 963–973. doi:10.1111/j.1467-9280.2009.02402.x
- Krapp, A., Hidi, S., & Renninger, K.A. (1992). Interest, learning, and development. In K.A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 1–26). Hillsdale, NJ: LEA.
- Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin, 116*, 75–98. doi:10.1037/0033-2909.116.1.75
- Magner, U.I., Schwonke, V., Alevin, V., Poppescu, O., & Renkl, A. (2014). Triggering situational interest by decorative illustrations both fosters and hinders learning in computer-based learning environments. *Learning and Instruction, 29*, 141–152. doi:10.1016/j.learninstruc.2012.07.002
- Mitchell, M. (1993). Situational interest: Its multifaceted structure in the secondary school mathematics classroom. *Journal of Educational Psychology, 85*, 424–436. doi:10.1037/0022-0663.85.3.424
- Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotion*. New York, NY: Oxford University Press.
- Renninger, K.A. (1992). Individual interest and development: Implications for theory and practice. In K.A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 361–395). Hillsdale, NJ: LEA.
- Renninger, K.A. (2000). Individual interest and its implications for understanding intrinsic motivation. In C. Sansone & J.M. Harackiewicz (Eds.), *Intrinsic motivation: Controversies and new directions* (pp. 373–404). San Diego, CA: Academic Press. doi:10.1016/B978-012619070-0/50035-0
- Renninger, K.A. (2009). Interest and identity development in instruction: An inductive model. *Educational Psychologist, 44*(2), 1–14. doi:10.1080/00461520902832392



- Renninger, K.A., & Hidi, S.E. (2016). *The power of interest for motivation and engagement*. New York, NY: Routledge.
- Renninger, K.A. Hidi, S., & Krapp, A. (Eds.). (1992). *The role of interest in learning and development*. Hillsdale, NJ: LEA.
- Roure, C., & Pasco, D. (in press). Exploring situational interest sources in the French physical education context. *European Physical Education Review*. [published on line 8/11/2016] DOI: doi:10.1177/1356336X16662289
- Roure, C., Pasco, D., Pope, Z., & Gao, Z. (2015). High school students' situational interest and physical activity levels in exergaming. In Z. Gao & Z. Pope (Eds.), *Physical activity behaviors and determinants in children and adolescents* (pp. 103–116). New York, NY: Nova Science Publishers.
- Schiefele, U. (1996). Topic interest, text representation, and quality of experience. *Contemporary Educational Psychology*, 12, 3–18. doi:10.1006/ceps.1996.0002
- Shen, B., & Chen, A. (2006). Examining the interrelations among knowledge, interests, and learning strategies. *Journal of Teaching in Physical Education*, 25, 182–199. doi:10.1123/jtpe.25.2.182
- Shen, B., Chen, A., & Guan, J. (2007). Using achievement goals and interest to predict learning in physical education. *Journal of Experimental Education*, 75, 89–108. doi:10.3200/JEXE.75.2.89-108
- Shen, B., Chen, A., Tolley, H., & Scrabis, K.A. (2003). Gender and interest-based motivation in learning dance. *Journal of Teaching in Physical Education*, 22, 396–409. doi:10.1123/jtpe.22.4.396
- Shen, B., McCaughtry, N., Martin, J., & Dillon, S. (2006). Does “sneaky fox” facilitate learning? Examining the effects of seductive details in physical education. *Research Quarterly for Exercise and Sport*, 77, 598–506.
- Sherhoff, D.J. (2013). *Optimal learning environments to promote student engagement*. New York, NY: Springer. doi:10.1007/978-1-4614-7089-2
- Silvia, P.J. (2006). *Exploring the psychology of interest*. Oxford, UK: Oxford University Press. doi:10.1093/acprof:oso/9780195158557.001.0001
- Sun, H. (2012). Exergaming impact on physical activity and interest in elementary school children. *Research Quarterly for Exercise and Sport*, 83, 212–220. doi:10.1080/02701367.2012.10599852

Sun, H. (2013). Impact of exergames on physical activity and motivation in elementary school students: A follow-up study. *Journal of Sport and Health Science*, 2, 138–145. doi:10.1016/j.jshs.2013.02.003

Sun, H., & Gao, Y. (2016). Impact of an active educational video game on children's motivation, science knowledge, and physical activity. *Journal of Sport and Health Science*, 5, 239–245. doi:10.1016/j.jshs.2014.12.004

World Health Organization. (2010). *Global recommendations on physical activity*. Switzerland: Author.

Zhu, X., Chen, A., Ennis, C.D., Sun, H., Hopple, C., Bonello, M., . . . Kim, S. (2009). Student situational interest, cognitive engagement, and learning achievement in physical education. *Contemporary Educational Psychology*, 34, 221–229. doi:10.1016/j.cedpsych.2009.05.002