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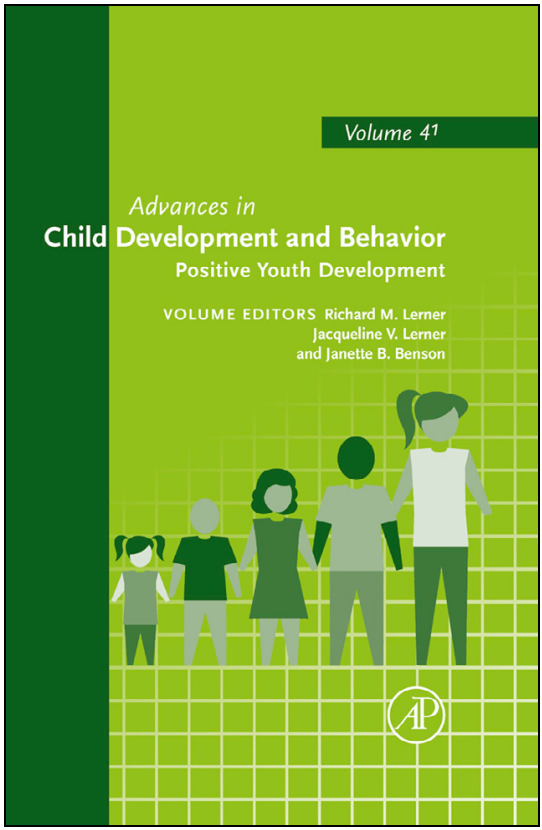

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INTRINSIC MOTIVATION AND POSITIVE DEVELOPMENT

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Abstract

Decades of scientific research shows that intrinsic motivation (IM) is a powerful "engine" of learning and positive development. This chapter synthesizes the research, first showing how the psychological state of IM is associated not only with enhanced engagement and perseverance in an activity, but also with greater use of meta-cognitive strategies and deeper processing of information. These features likely account for evidence that IM is related to greater and more effective learning. Second, we examine the determinants of this beneficial state. Evidence suggests that it results from the convergence of factors at multiple levels—from immediate conditions in the activity to longer-term personal goals, cultural values, and human dispositions. Drawing on these findings, we show that there is considerable potential for young people to develop their abilities to experience and regulate their IM within activities. In the third and final section, we then discuss how youth professionals can work with youth to help them cultivate the capacity for intrinsically motivated learning. We present ten guiding principles for cultivating IM derived from the research. We give particular attention to adolescence, because it is a period when youth become more able to engage in this deliberate cultivation – to be producers of their own development.

I. Introduction

"Perhaps no single phenomenon reflects the positive potential of human nature as much as intrinsic motivation."

Ryan & Deci (2000, p. 70)

Ron, a recent high-school dropout, is hunched over sound-mixing equipment in a state of intense absorption, a state his teachers would not have recognized. He is flipping switches and adjusting dials, working to enhance voice tracks from aspiring rappers by adding background music and beats. He explains how Midwestern rappers use fast lyrics with tongue twisters, while those from South use "curl rap." His challenge is to get just the right background tracks for each artist. Since he started using this equipment, Ron has wanted to learn everything he can about sound mixing, motivated by his "love of music." Although Sheri, a rural youth, is engaged in a much different activity—planning activities for young

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children—she experiences the same kind of deep absorption. She has learned how children of different ages and backgrounds like different activities. The challenge she and friends are working on is to plan games fit to Saturday's group of 5 to 7-year-olds. Similar to Ron, Sheri explains her motivation: "It's interesting, I love helping little kids."

Both youth experience a psychological state in which they are *highly motivated* and their *attention is deeply engaged* in the activity. Motivation drives their engagement; the engagement, in turn, creates experiences that reinforce their motivation. To be clear, this absorbed state is *not* what people experience watching a good movie. Ron and Sheri are not being passively entertained by a screenplay created by someone else. They are actively directing their own participation in the activity. They are motivated by the process of thinking through and addressing the challenges of getting the right sound mix and designing activities that 5- to 7-year-olds will enjoy.

Psychologists call this state of motivated engagement *intrinsic motivation* (IM). By "intrinsic," they mean the activity is—or has become—motivating in and itself. It is self-motivating. IM can be experienced in play, recreation, or work, any activity that is challenging (Csikszentmihalyi, 1990; Sansone & Harackiewicz, 2000). Psychologists contrast it with "extrinsic motivation" in which a person is driven, not by the activity, but by external rewards or threats.

Decades of research shows that IM is related to improved performance and learning within an activity. Controlling for other factors, individuals who are intrinsically motivated are likely to think more strategically, generate more creative solutions, persist through difficulties, and learn more from their experiences (Ryan & Deci, 2000). Because their attention and motivation (their "hearts and minds") are more fully engaged, their mental work is thought to be more efficient and effective. Increasing evidence suggests that IM is a basic human *psychological system* that mobilizes engagement in important but challenging activities, including learning (Izard & Ackerman, 2000; Ryan & Deci, 2008). Many scholars and educators have taken the next step and argued that this system has enormous—but often untapped—potential to energize young people's sustained engagement in learning and development (e.g., Bruner, 1966; Csikszentmihalyi, 1990; Dewey, 1913).

This chapter examines this potential. We present and evaluate the theory that IM can serve as a powerful engine of learning and development. Although we are proponents of this theory, we are also realists. Romantic images of eager teenagers rapturously engaged in a "natural" process of perpetual learning need to be viewed with a critical eye. Motivation is complex and is responsive to a myriad of factors. Sheri said she is most motivated when able to work unimpeded, thus

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she became de-energized when the adult supervising their next event vetoed her plans and forced them in an unwanted direction. In the real world, IM fluctuates as a function of a person's ongoing experiences in an activity, goals, expectations, and other factors that we will examine. Motivation also differs by person and activity. Although Ron's newfound passion for sound mixing later helped him earn his high-school degree, IM in one activity does not necessarily transfer to another.

The promise, however, is that the capacity for IM can itself develop. Like other basic psychological systems (such as those for attachment and for different emotions), we argue that the human IM system is designed to allow enormous developmental plasticity. It is what evolutionary biologist Ernst Mayr (2001) called an "open system," one that can be shaped by experience, culture, and deliberate cultivation. We give particular attention here to adolescence—because it is a period when youth become more able to engage in this deliberate cultivation—to be producers of their own development (Larson, 2011; Lerner, 2002). Adolescents gain potentials to acquire meta-cognitive understanding and executive skills for managing their psychological processes, including their motivation (Steinberg et al., 2006; Zimmerman, 2002).

In this chapter, we synthesize research from different conceptual paradigms (theories of interest, self-determination, flow, effectance motivation, mastery orientation) into a composite theory of IM as a *single* psychological system: a system that can mobilize positive development. (This composite, we acknowledge, overlooks some important debates in the motivation literature.) We begin by examining IM as a state: What are its subjective features and what is the evidence that this state facilitates learning and positive development? In the subsequent section, we examine the diverse factors that contribute to (as well as obstruct) a person's experience of this state. We also discuss how these factors can develop. In the final section, we then discuss the implications for professionals working with young people. What does the research suggest they can do to help youth experience and cultivate IM?

Many of the illustrations we use in the chapter, like those of Ron and Sheri, come from organized after-school youth programs. We believe they are a particularly good context to observe motivational development and positive development more generally (Larson, 2011). It should be noted that we focus on IM within a Western cultural context. We should also be clear that we do not see IM as the sole catalyst of positive development. Sometimes positive development stems from negative experiences, even horrific events that lead to personal reappraisal. Other psychological systems (e.g., for altruism) also contribute to development, separately or in tandem with IM.

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II. Intrinsic Motivation as a Catalyst of Learning and Development

A. THE FUNCTION OF INTRINSIC MOTIVATION

IM can be seen as a missing piece in an important puzzle. Humans are designed as a species to be learners and doers. Although lacking in the sensory acuity, strength, speed, and built-in weapons of other creatures, we are distinguished by our enormous cerebral cortex—a massive central processing unit (about 20 billion neurons)—which allows us to pursue cognitively complex and challenging goals. A limitation is that a substantial portion of this massive processor arrives relatively "unprogrammed." But of course that is the beauty of the human brain. It allows us to learn and adapt to diverse physical, social, and, now, technological environments. In fact, humans have a longer childhood than any other species, presumably to allow us to begin loading all those neurons with experience, knowledge, and skills (Bjorklund & Ellis, 2005)—to practice and develop our human potential for learning and doing.

The missing piece is the motivation to do this—to learn and use this big brain for challenging activities. This is a major function that psychologists attribute to the IM system: to mobilize conscious and deliberate processes of learning and development (Csikszentmihalyi, 1990; Ryan & Deci, 2009). Just as it would make no evolutional sense to have sex organs without the motivation to use them, it would make no sense to have large, adaptable brains without a system to motivate us to develop them to address the challenges of diverse human environments. Although evidence on the neurological mechanisms of IM is very limited, it has been speculated that it represents an evolution of a basic "seeking system" from our evolutionary forbearers, a system for exploring and pursuing goals (Hidi, 2006; Panksepp, 1998).

In this section, we examine the proposition that IM mobilizes an *effective and efficient* psychological state for learning and development. The argument is that IM not only provides motivation to deal with challenges, but also it alters how the mind processes information to facilitate high quality attention to the task at hand. It allows humans to devote deep, sustained attention to episodes of work and learning. We first describe the subjectively experienced features of this state, and then, we examine evidence that it increases cognitive effectiveness and efficiency and helps sustain engagement.

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B. FEATURES OF INTRINSICALLY MOTIVATED EXPERIENCES

Herbert Simon argued that a good place to start in trying to understand a conscious mental process is with accounts of people who experience it (Newell & Simon, 1972). Csikszentmihalyi and his students have given the most attention to this task for experiences of IM. Thus we draw on narrative reports from adults and adolescents they interviewed about episodes of IM. We summarize four central features of the experience of IM (which Csikszentmihalyi calls "flow") that suggest why this state creates favorable conditions for conscious learning and development (Csikszentmihalyi, 1975, 1990).

The first feature of IM experiences is *feeling challenged* by the activity. Like Ron and Cheri, the many people whom Csikszentmihalyi interviewed saw a problem or something difficult in the activity that they wanted to take on. From an early age, human's minds are attracted by curiosity toward things that are new (Lepper & Henderlong, 2000). As they get older, they are also attracted by longer-term future goals they want to accomplish, including goals that involve increasing complexity. At a yet more advanced stage, Csikszentmihalyi (1996) interviewed eminent scientists, authors, artists, and civic leaders who described experiencing deep IM in trying to solve complex challenges in their fields. Just because a task is difficult, however, does not mean someone will find it engaging. What one person finds challenging may be of no interest to someone else. We will discuss why this is in Section III, but for now it is important to recognize these individual differences.

A second feature of IM is experiencing a *sense of control* over the activity. People in the state of IM described a feeling of confidence that "I can do it" or "we can do it." This is similar to the experience of self- or collective efficacy that Bandura (1997) found to be important to motivation. Although one's confidence may be based on past experiences, what Csikszentmihalyi's respondents described was not just their actual control, but their perception that they could control what was ahead (i.e., "the *possibility* rather than the actuality, of control"; Csikszentmihalyi, 1990, p. 60). This requires keeping feelings of self-doubt and worry at bay—an attitude of optimism about one's abilities to address the challenges. For example, a 9th grader experiencing IM reported feeling "real strong and in control, like I could do anything" (Larson, 2000, p. 174). A dancer described the feeling of being able to "radiate an energy into the environment" (Csikszentmihalyi, 1975, p. 44). This sense of efficacy may help people think ahead, imagine emerging challenges, and decide how to deal with them (Bandura, 1997).

The third and fourth features, mentioned at the outset, are *deep attention* and the experience of *high motivation*. There is more to say about

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each. Csikszentmihalyi's (1975, 1990) respondents described their attention as totally focused on the task at hand, with their minds "cut off" from issues in their outside lives. Attention was fully engaged in the challenges of the activity. People experiencing IM report reduced self-consciousness and reduced awareness of passing time (afterwards they report that time went really slow, fast, or just disappeared). One youth reported, "You change, you forget everything around you" (Larson, 2000, p. 174). This deep attention is related to the other features of IM. Shernoff, Csikszentmihalyi, Schneider, and Shernoff (2003) found when high-school students experienced a classroom activity as challenging and within their control, they also rated their concentration and attention as greater.

Csikszentmihalyi (1990) argues that this focused attention helps a person use the finite capacity of the conscious mind most effectively. Research indicates that working memory—the central processor of human consciousness—can only hold 3–5 bits (or "chunks") of information at one moment. Studies show that even small distractions can severely compromise a person's ability to solve problems. The experience of deep, undisturbed attention in IM is theorized to allow optimal use of consciousness.

The fourth factor, high motivation, involves feeling energized by the activity. People report that the activity was enjoyable and self-rewarding. Csikszentmihalyi (1990) quotes a surgeon who said of her work, "It is so enjoyable that I would do it even if I didn't have to." (p. 67). Suzanne Hidi (2000) obtained similar descriptions from her research on the state of interest, and notes: "Although focusing attention and continuing cognitive engagement normally requires increased effort, when interest is high, these activities feel relatively effortless" (p. 311). Ryan and Deci (2000) emphasize that because challenge and attention are experienced as emergent from the self, people experience IM as self-determined: People are doing what they want to be doing. This enjoyment, effortlessness, and experience of volition are what make the activity self-sustaining: people report that these positive feelings encourage them to keep doing the activity and return to it in the future.

For Csikszentmihalyi (1990), a crucial point is that this motivation comes from engagement with "complexity"—with difficult and challenging problems. His research shows that the experience of flow is not confined to leisure activities. In fact, it is more frequent in people's jobs—when they are doing constructive work and creating order out of different forms of complexity. For adolescents, the experience of IM is most common in youth programs, a context in which youth are taking on complex, often unstructured challenges, for example, in creating a theater production or trying to improve their communities (Csikszentmihalyi, Rathunde, & Whalen, 1993; Larson, 2000). The psychological system of IM,

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Csikszentmihalyi argues, is designed specifically to catalyze difficult work, including learning.

In sum, adults' and youth's accounts of their IM experiences suggest how this state provides conditions for effective, efficient, and self-sustained learning within an activity. IM is associated with the experience of control over the challenges of the activity, focused attention, and feelings of enjoyment and effortlessness in taking on these challenges. It is essential, however, to evaluate whether these benefits, identified from qualitative interviews, are verified by quantitative experimental and longitudinal studies. We first examine evidence on whether the state of IM changes immediate mental functioning in ways that facilitate learning. Then we ask whether repeated experiences of IM are associated with favorable long-term outcomes.

C. EVIDENCE ON THE IMMEDIATE EFFECTS OF INTRINSIC MOTIVATION

The first question is whether IM has immediate effects on how effectively people process information. A substantial number of studies provide evidence on this. These are largely single-session lab or classroom studies in which participants experiencing high versus low IM were compared on information processing tasks. In some studies, participants were subject to a manipulation that either increased or decreased their IM (e.g., by giving them interesting vs. boring tasks). In other studies, the high and low groups were identified based on their reports of enjoyment, interest, or engagement in a comparable task. This research has identified three differences in information processing related to IM.

1. More Strategy Use

First, IM predicts people's increased use of strategies, including metacognitive strategies, to guide their work (Hidi, 2001; Hidi & Harackiewicz, 2000; Krapp, 1999). In one example, 7th grade students who reported greater intrinsic interest in English and science tasks were more likely to employ self-regulatory and cognitive strategies (such as paraphrasing and planning) to improve their work in these tasks, regardless of prior achievement level (Pintrich & DeGroot, 1990). In another study, college students who expressed more interest in a course topic at mid-semester reported greater use of strategies such as critical thinking and elaboration to prepare for the final exam (Krapp, 1999). The strategies employed by IM students in these studies included those for more effective processing

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of information as well as those for enhancing their motivation and interest in the tasks (Sansone & Smith, 2000). Evidence for use of more advanced meta-cognitive strategies comes from studies with adolescents and college students. In sum, people who are intrinsically motivated appear to exercise more executive control to increase their learning effectiveness. Confirmation of this improved effectiveness and efficiency is provided by findings that college students who read interesting texts needed *less* time and were able to recall more (Shirey & Reynolds, 1988).

2. Deeper Processing of Material

Closely related, researchers have found that IM predicts greater cognitive activity and deeper cognitive processing of the task at hand. Studies that controlled for prior knowledge and intelligence found that youth experiencing greater IM engaged with more ideas, made more inferences, and were better able to answer complex questions about the material (Schiefele, 1999). In one study, Schiefele (1996) found that, whereas high-school students with low interest produced more verbatim representations of the text, those experiencing high interest were more likely to represent the text in propositional form and engage in more processing of the text's meaning. In another study, Schiefele (1991) found that college students who were more interested in a topic created more mental images, produced more thoughts and ideas about it, and made more connections to personal experience.

3. More Expansive and Integrative Reasoning

Laboratory research also suggests that IM predicts more open and creative processing of information. In random assignment studies, research subjects assigned to intrinsically motivating conditions (as compared to those in extrinsically motivating conditions) engaged in greater exploration, were more likely to break set, and were more likely to formulate original solutions to problems as evaluated by impartial judges (Amabile, 1983; Hennessey, 2000; Koestner, Ryan, Bernieri, & Holt, 1984). This finding is consistent with research showing that people experiencing positive emotional states are more likely to think expansively about possible actions and engage in creative problem solving (e.g., see reviews by Fredrickson, 2001; Isen, 2000).

Though subject to further testing, this research provides substantial evidence that IM influences how people process ideas and information. When intrinsically motivated, they are more likely to employ strategies including meta-cognitive strategies to regulate their thought processes

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and motivation. In addition, they are likely to engage in processing at deeper and more complex levels and do so in more original ways. Learning becomes more effective and efficient.

D. EVIDENCE ON THE CUMULATIVE OUTCOMES FROM INTRINSICALLY MOTIVATED EXPERIENCES

The most important test of the potential of IM as a catalyst of positive development is outcome research that evaluates whether repeated experiences of IM in a particular domain predict long-term differences in behavioral outcomes. Most studies that have addressed this have not directly measured repeated experiences of IM but rather examined whether youth reported enjoying, being motivated by, or having interest in an activity over a span of time. Our review focuses on the relationship between these variables and outcomes in three domains: learning, development, and motivation. Although we give most weight to longitudinal studies, we have included some cross-sectional research especially for outcomes where longitudinal findings are limited.

1. Learning and School Achievement

Studies in classroom settings have generally found a modest but positive predictive relationship between IM and learning (Lepper, Corpus, & Iyengar, 2005; Lepper, Sethi, Dialdin, & Drake, 1997; Ryan & Deci, 2009; Schiefele, Krapp, & Winteler, 1992). A few studies found that the relationship between interest and school performance becomes nonsignificant once other potential predictors were controlled (Köller, Baumert, & Schnabel, 2001). However, many other studies have shown more robust relationships. For example, a recent longitudinal study found that enjoyment mediated predictive relationships between subject matter goals and school achievement (Daniels et al., 2009). Although most of this research has only used general measures of learning (school grades or test scores), some studies have examined deeper cognitive processing. Consistent with the short-term studies we just reviewed, this research finds that students who report more IM in schoolwork show greater conceptual learning than other students, suggesting deeper processing of the material (e.g., Grolnick & Ryan, 1987; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). It should also be noted that several studies of interventions designed to increase students' interest in science have found evidence of improvements in the students' science achievement (e.g., Grolnick, Farkas, Sohmer, Michaels, & Valsiner, 2007; Hoffmann, 2002). In sum,

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most of the available evidence supports the postulate that the experience of IM enhances learning.

2. General Development

It is argued that IM can facilitate not just learning but more general development, including development of emotional maturity, identity, social skills, and other life skills (Csikszentmihalyi, 1990; Larson, 2000). This possibility is suggested by research showing that people who are self-motivated have higher vitality, self-esteem, and general well-being (Ryan & Deci, 2000, p. 69). We found only a few quantitative studies bearing directly on the relationship between IM and development. Most were conducted in after-school programs.

The findings, nonetheless, are consistent with the hypothesis that IM facilitates general development. In a longitudinal study, Mahoney, Parente, and Lord (2007) found that observational ratings of older children's engagement (paying attention, demonstrating interest) in the activities of nine after-school programs predicted significant increases in leader-rated social competence over a school year. In a cross-sectional study, Shernoff (2010) showed that middle school students' reports of psychological engagement during program activities mediated the relationship between program participation and measures of social competence. A third study was a survey of 1800 high-school juniors in which each reported on two activities, thus allowing use of within-person comparisons as well as other controls (Hansen & Larson, 2007). Multilevel analyses found that when students reported IM in an after-school activity, they reported more frequent developmental experiences related to identity work, developing initiative, emotional development, and acquiring teamwork and social skills.

3. Sustained Motivation in the Activity

One of the core hypotheses about IM is that it can lead to sustained motivation. In interest theory, initial experiences of IM (called *situational interest*) can grow into more enduring *dispositional interest*—the "love" Ron and Sheri described for their activities. The evidence on this question is quite robust. Findings confirm that experiences of IM are related to increased participation and interest. Reported experience of IM (or situational interest) consistently predicts a person's likelihood of subsequent participation in an activity or topic area (Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Simpkins, Davis-Kean, & Eccles, 2006; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). For example,

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Lavigne and Vallerand (2010) found that high-school students who participated in science activities they enjoyed during the semester, later reported greater interest and intention to take further science classes and to pursue a career in science. Consistent with interest theory, the research shows that if initial experiences in an activity are positive, they can lead to dispositional interest and expanded long-term participation (Hidi & Renninger, 2006).

E. A CATALYST OF DEVELOPMENT?

Accumulating evidence, then, supports the existence of a psychological system that, when activated, mobilizes and enhances engagement including engagement in learning. Qualitative studies find that people in the state of IM experience control over challenging activities, as well as focused, efficient attention, and a feeling of enjoyment and reward that makes them want to continue participation in the activity. Quantitative research confirms influence on measurable behavior. Short-term studies indicate that IM is related to indicators of greater use of meta-cognitive strategies, deeper processing of information, and more expansive and integrative reasoning. Longer-term studies show that IM is associated with greater learning (though relationships to grades are modest) and sustained motivation.

Research on the postulate that IM facilitates general development is less advanced but is promising. The quantitative findings we reviewed are supportive but sparse, due to lack of research. Qualitative research, however, has documented processes in after-school programs through which youth's repeated episodes of deep motivated attention in projects led to significant developmental insights and the acquisition of self-management strategies. In our research and that of others, youth described how their engagement and grappling with psycho-social challenges in the activities was related to becoming more responsible (Wood, Larson, & Brown, 2009), developing skills to manage emotions (Larson & Brown, 2007), learning to regulate cognitive biases (Kirshner, Pozzoboni, & Jones, under review; Watkins, Larson, & Sullivan, 2007), and developing strategic skills for agency (Larson & Angus, 2011a). Kirchner and colleagues' study, for example, showed how youth leading a research project learned from struggling with the challenge of reconciling passionately held beliefs with data they obtained that contradicted these beliefs. We suggest that the IM experienced by youth in these after-school programs helped activate episodes of deeper, expansive, and integrative meta-cognitive reasoning that led to conscious developmental

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change. As Fredrickson (2001) argues, positive psychological states can help individuals "broaden and build" their cognitive resources.

It should be emphasized, however, that much further research is required on the IM system. More evidence is needed on the coherence of the different features of IM (how strongly do they co-occur?) and whether these features (singly or as a group) predict short- and long-term outcomes independently of possible confounds. Research across more diverse contexts is needed: the studies we reviewed come almost entirely from Western nations, and most focus on children or youth engaged in school tasks. Another concern is that our review combined evidence from different paradigms (most notably flow, interest, and self-determination theory [SDT]), yet there are cleavages in how these different frameworks conceptualize motivational processes.[1] Finally, more research on biological substrata of the IM system needs to be conducted. Some researchers have speculated on the specific neurological mechanisms associated with IM (e.g., Hidi, 2006), pointing to the possible role that the dopamine system plays in attention, intentional action, and the seeking of rewards or positive feedback (see reviews by Alcaro, Huber, & Panksepp, 2007; Seamans & Robbins, 2010). But rigorous tests have yet to be done.

Despite limitations of this research, there is enough evidence on the role of IM as catalyst of learning and development to ask the next question: What influences its occurrence? If it can mobilize deep, sustained, self-direct attention to learning and development, we need to know what activates it.

III. Factors that Shape the Experience of IM

A. THE URGENCY AND COMPLEXITY OF MOTIVATION

Motivation is an urgent issue for youth if they are to thrive in a complex global society. The quantity of information they must learn keeps increasing. The types of problems and opportunities they encounter as they come of age require that they are motivated to keep learning and problem solving (Larson, 2011). Yet as children move into the teen years, their daily experiences of intrinsic motivated learning typically decline—especially

[1]For example, in contrast to authors who posit general skills for IM (e.g., Csikszentmihalyi & Larson, 1984), Hidi and Renninger (2006) describe *interest* exclusively tied to a specific topic (e.g., birds or astronomy). Ryan and Deci (2000) reserve the concept of intrinsic motivation for experiences that are directly related to basic psychological needs.

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in schoolwork—accompanied by decreased interest in taking on challenging tasks (Eccles & Roeser, 2009; Wigfield et al., 2006). They appear to have fewer episodes in daily life in which they benefit from the efficient, effective learning of IM. It is essential therefore to understand the mainsprings of the type of eager, sustained engagement in learning experienced by Ron and Sheri.

As with other human psychological systems, the determinants of IM are complex. IM is shaped by immediate ongoing factors within the activity, as well as longer-term factors and personal dispositions. Just as the reasons a person feels angry or in love are likely to entail more than what is happening in the moment, IM is influenced by an array of bio-psycho-ecological elements, including basic needs, personal values, goals, and cultural influences. Our goal in this section is to get a handle on how proximate and more global factors converge to activate IM. An underlying theme is that, although there are many obstacles to experiencing IM in real-world circumstances, research and theory suggest ways in which a person's capacities for IM can develop.

B. FACTORS IN THE ONGOING PERSON-ACTIVITY INTERACTION

What is happening in the immediate interaction is certainly crucial to whether a person experiences the motivated attention of IM. Csikszentmihalyi (1975, 1990) and others have identified a number of factors in a person's interaction with an activity that are associated with IM. Some are directly related to what we have already discussed: Is the person challenged? Do they experience a sense of control? Are there distractions that interfere with focused attention? IM also is more likely when activities include novelty (Berlyne, 1966) and are rich in sensory stimuli. Activities that engage the senses may engage the brain more deeply (Kandel, 2007). In addition, youth are more motivated when they are working on projects for an authentic audience and purpose (Lenhart, Arafeh, Smith, & Macgill, 2008; Magnifico, 2010). For example, in one study, students showed higher quality work when writing brochures for a local nature center than writing a similar assignment only to receive a grade (Purcell-Gates, Duke, & Martineau, 2007).

The *structure* of the interaction between person and activity also influences IM. Csikszentmihalyi found that IM is more frequent when the goals in the activity are clear and they possess clear models for action (i.e., techniques, guidelines, rules) to reach those goals. It is also important that people receive prompt and unambiguous feedback—that they have

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clear information on the effects of their actions. These factors help explain why games are enjoyable: they provide this type of clarity for players.

The factor that Csikszentmihalyi found to be particularly significant to IM was that the *difficulty of the challenges in the activity be matched to—or slightly above—a person's skill level*. When people perceive the challenges as much greater than their skills, they experience anxiety and often become demotivated. In after-school leadership programs we studied, youth reported anxiety (and demotivation) when they were trying to plan an activity without prior planning experience. Their motivation was restored, however, when staff members broke the tasks down into manageable pieces and gave them training that increased their skills. An opposite situation occurs when people perceive activities as too *easy* for their skills. This creates boredom and again IM can wane. In a consciousness-raising program, SisterHood, participating youth reported at midyear that their discussions, organized by the advisors, had become stale and boring. But the youth's motivation increased when the advisors turned the planning over to the youth, which demanded that they develop more advanced skills. The importance of this matching challenge to skills for fostering motivation, attention, and sense of control has been confirmed by experience sampling research (Massimini, Csikszentmihalyi, & Delle Fave, 1988; Moneta & Csikszentmihalyi, 1996). People are more likely to experience IM when they are grappling with challenges that fully demand but do not overwhelm their abilities.

A final factor, important to maintaining IM over time, is that the activity provides a *ladder of increasingly difficult challenges* (Csikszentmihalyi & Larson, 1984; Nakamura & Csikszentmihalyi, 2009). The reason for this is clear. If people keep addressing the same challenges over again, they will learn all they need to know and the activity will likely become boring. To continue to experience IM, people need to be able to move gradually toward more difficult challenges. This is another reason why many computer games are so alluring, because players can advance to harder yet manageable levels of challenge (Malone, 1980). At Sisterhood, this was achieved when youth progressed from providing suggestions on discussion topics to planning the discussions themselves. The optimal conditions for learning, then, occur when people can stay in what Csikszentmihalyi calls a "channel" of manageable challenges that increase as their skills develop.[2]

[2]This channel is similar to Vygotsky's notion of the "zone of proximal development"; but IM theory helps us understand that this zone or channel is important not only for learning processes but also for mobilizing and sustaining IM.

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Csikszentmihalyi describes adults who were skilled at restructuring their activities to keep themselves in this channel. They had learned to extract meaningful feedback in situations that would be ambiguous to someone else. They were able to reframe their goals or break tasks down into manageable challenges in order to keep in the zone. If they got anxious or bored, they could read the cues and make adjustments. We discuss later how youth can develop these skills.

C. LONGER-TERM DISPOSITIONS AND FACTORS

IM, however, does not depend entirely on a person's *current* interaction with the activity. There are longer-term factors that also contribute. Researchers have identified different types of more enduring dispositions and factors that influence whether a person is engaged by the activity. These include psychological needs, dispositional interest, and connections between the activity and personal goals.

1. Psychological Needs

Self-determination theorists have identified three empirically supported human needs that contribute to IM. These basic needs—which they posit to be universal in the species—include needs for *connection, competence, and autonomy* (Ryan & Deci, 2000). The first two needs are not controversial. Over the past 50 years, psychologists have increasingly recognized the fundamental social nature of the human species—and a basic need for connection. Across ages, people function better and are more motivated when they have "secure attachments" and when they experience trusting and supportive relationships with people within an activity setting (Lerner, Phelps, Forman, & Bowers, 2009; Wentzel, 2009). A youth is much less likely to experience IM in a classroom or youth program if the social climate is hostile. The psychological need for competence is also strongly supported by research. The need to experience oneself as competent is recognized as a basic source of motivation, not only in SDT but also in achievement goal theory (Dweck & Leggett, 1988) and expectancy value theory (Eccles & Roeser, 2009), among others (White, 1959). People are most likely to be highly motivated in activity settings in which they have opportunities to experience competence.

The most controversial of the three needs is the need for autonomy. The controversy stems partly from the term "autonomy," which easily suggests Western notions of individualism. Ryan and Deci (2000) clarify, however, that, "Within SDT, autonomy refers not to being independent,

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detached, or selfish but rather to *the feelings of volition that can accompany any act, whether dependent or independent, collectivist or individualistic*" (p. 74, italics added). Their point is that humans have a need to experience volition (being an "origin" of one's actions), but it can be experienced as an individual or part of a group. In the example of SisterHood, youth's motivation stemmed from this experience of collective volition in planning their discussions (Larson, Jensen, Kang, Griffith, & Rompala in process). Research from multiple cultures confirms that this experience of volition is related to the features of IM (including greater engagement, better performance, and higher quality learning; Ryan & Deci, 2003).

Research also shows that these features of IM are increased when the adults in the setting provide "autonomy support"—when they promote youth's exercise of volition in the activity (Lavigne, Vallerand, & Miquelon, 2007; Pelletier, Séguin-Lévesque, & Legault, 2002; Soenens et al., 2007). Supporting youth's *perception* of volition, however, appears to be more important than maximizing their actual volition. When youth have responsibility for more than they can handle, this can create anxiety and undermine their IM (Larson & Dawes, in press). As youth become more experienced within a domain, they become capable of more autonomy and, indeed, may need it to maintain their experience of IM.

2. Dispositional Interest in the Activity

Another set of longer-term factors that influence IM is a person's development of dispositional interest in an activity or subject matter. We have already cited evidence showing that short-term positive experiences of "situational interest" can develop into enduring dispositional interest. As an example, Renninger (2010) describes how Jane Goodall's initial childhood interest in worms grew into a deep passion and a career as a world-renowned primatologist. Hidi and Renninger (2006) present a fuller research-based theory on how this development occurs, including a sequence of stages concluding with "well-developed" dispositional interest.

This development is driven by and depends on a person acquiring *knowledge, skills, and positive emotional associations* to the activity or subject. Acquisition of knowledge and skills provide a foundation for meaningful participation in the activity. As these grow, students become more able to generate their own curiosity, set challenges for themselves within the activity, and anticipate future steps in their work.

Development of interest also depends on a person experiencing positive emotions along with their acquisition of knowledge and skills (Hidi, 2006; Renninger, 2010). In the early stages, positive affect *during* the experience is important to the development of interest—memories of participation

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become associated with positive affect and meaning. In later stages, positive emotion may be generated by anticipation of the activity, ongoing curiosity about the topic, and enjoyment of gaining competence. These stored positive emotions fuel greater persistence when encountering obstacles and frustration. Memories of prior positive experiences help students sustain long-term constructive work, including persevering through frustrating obstacles in the work (Hidi & Renninger, 2006).

In principle, almost anything can become a topic of interest—worms, action figures, calculus proofs, no matter how obscure—as long as these processes occur. As suggested earlier, this flexibility is the "beauty of the human brain." Within educational settings, development of interest is more likely when students work in groups, work on projects, experience success, and interact with materials that are interesting (Ainley, Hidi, & Berndorff, 2002). Across stages, there appears to be a reciprocal relationship between success and growing dispositional interest: interest in a class predicts exam performance; exam performance predicts subsequent situational interest (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008).

3. Goals, Values, Purpose, and Personal Connection

The development of a positive disposition toward an activity, however, is not just a "bottom-up" process that emerges from immediate, ongoing experiences in the activity. There are also more general "top-down" processes that influence the meaning people attribute to that activity and, in turn, their propensity toward IM. Adolescence is a life stage when youth begin to work on identity issues: who am I, what do I care about, what do I want to do with my life? The values, goals, and life purposes they develop are another set of dispositions they bring to an activity that influence their participation, their investment in the challenges of an activity, and their experience of IM (Eccles, 2009; Nasir & Hand, 2008; Wortham, 2006). Damon (2008) describes how young people's development of purpose ("a stable and generalized intention to accomplish something that is at the same time meaningful to the self and consequential to the world beyond the self"; p. 121) can lead to passionate engagement in an activity (see Mariano & Going, this volume).

In many cases, these bottom-up and top-down processes and factors influence each other. Bottom-up experiences in activities feed development of knowledge, skills, and positive emotions in an activity. At the same time, people develop top-down life goals, values, and identities that feed investment and interest. We observed this reciprocal process among a group of adolescents who described marked increases in their IM in a youth program (Dawes & Larson, 2011; Pearce & Larson, 2007). Quite

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a number had joined for reasons that were not primarily related to the program's activities—they wanted to be with friends, parents had encouraged them to join, or participation fulfilled a high-school service requirement. They attributed their increased motivation to having formed a *personal connection* between the program activities and their values or emerging life goals. For youth in several activism programs, this connection, often shared with others, involved a process of coming to identify with the programs' social justice mission (e.g., to change their schools, to keep neighborhood youth out of gangs). Two youth in a theater program attributed their increased motivation to the program simultaneously helping them feel more certain about career goals (e.g., teaching, ministry) and seeing how skills they were learning would allow them to be competent in those professions.

This process of forming a personal connection closely resembles a process described by self-determination theorists through which an activity becomes integrated into the self (Ryan & Deci, 2000). Over many experiences, people may internalize and identify with the activity. As a result, they experience the motivation as coming from within as being self-determined.

4. Other Factors: Beliefs, Expectancies, and Culture

Eccles's (2005) comprehensive model of motivation identifies a host of additional dispositions that have been found to influence people's choices of activities, including beliefs, expectations of one's likelihood of achieving goals in the activity, perceptions of others' beliefs and expectations, gender roles, and cultural stereotypes. Research also shows that individuals who have a mastery goal orientation are more likely to experience IM and sustained effort (e.g., Cury, Elliot, Da Fonseca, & Moller, 2006; Dweck, 1999). Finally, research demonstrates how the beliefs, goals, social relationships, activities, and other factors that influence motivation are shaped by culture (Markus & Kitayama, 2003).

5. The Convergence of Factors

Psychology's understanding of the determinants of IM has advanced since an earlier era when, influenced by existentialism, a number of early IM theorists focused principally on immediate determinants. Recent research has led to a more multifactorial view of the springs of motivation. Diverse factors contribute from different levels of analysis: immediate and longer-term; individual and collective; setting characteristics and culture; basic psychological needs and a developing self. We suggest that it is the convergence of these multiple factors *as a whole* that shapes IM experiences.

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We have given particular emphasis to the convergence of immediate and longer-term factors. Although immediate sensory-rich experiences may be a dominant source of IM in the first few years of life, as children develop, more distal, constructed, and enduring factors enter into how they experience interactions with the environment. Their prior experiences, knowledge, values, goals, goal orientation, and culture frameworks (among other things) play a larger role in how they experience an activity. These longer-term and more global factors engage attention, shape whether the activity is challenging, and form the basis of personal connections. This can happen in ways that are both conscious and nonconscious.

Of course, even in adulthood, one may still experience delight and IM in something completely new, and of course, people experience enjoyment of challenging leisure activities that are not directly related to their primary life values and goals. But as a working hypothesis, we suggest that the more different determinants are aligned to support IM—the more overdetermined IM is—the deeper and more sustained engagement is likely to be.

D. OBSTACLES TO INTRINSIC MOTIVATION IN YOUTH'S DAILY LIVES

But let us return to the situation of young people in the "real world" of a complex global society. To fully understand why IM in learning activities is not a prevalent part of many youth's lives—and what can be done about it—we need to consider the many obstacles to IM in the bio-psycho-social ecology of daily life.

To begin with, IM has a lot of competition from other psychological systems. Emotions (anger, anxiety), appetites (desire, pleasure), and the desire for extrinsic rewards (recognition, material resources) are all products of psychological systems that can compete with the IM system to influence behavior. These different systems were also shaped by evolution to direct attention to important individual needs, including some that are more urgent. Survival needs easily trump IM. Receiving extrinsic rewards for an activity can also undercut the experience of self-determination that is important to IM, especially when youth view them as part of someone's attempt to control their behavior (Deci, Koestner & Ryan, 1999). In a stimuli-saturated world, daily events can repeatedly trigger these systems, disrupting IM (Csikszentmihalyi et al., 1993; Ryan & Deci, 2000; Urdan, 2003).

Another obstacle is that many of youth's daily activities do not provide the convergence of ongoing conditions or personal connections that are necessary for IM. Many activities simply are not structured in ways that readily

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facilitate IM. They do not provide sufficient novelty, the challenges entail unstructured problems in which goals and feedback are ambiguous, or the challenges are not matched to youth's skills. Even if these ongoing conditions are present, the activity may not be sufficiently aligned with a youth's needs, interests, or goals for the challenges of the activity to be personally challenging. A significant problem is that many youth are disengaged from the goal of becoming adults in today's society (Arnett, 2000; Schneider & Stevenson, 1999), which makes it harder for them to form personal connections to activities related to preparation for adulthood.

As a whole, our complex global society offers youth many more options, particularly via the Internet, but also more opportunities to be overwhelmed and distracted. However, Piaget (1971) and many others scholars have shown how the human mind-brain is a biological organism built to learn and adapt to complexity. In Csikszentmihalyi's theory, challenges and complexity are precisely what drives the IM system.

E. DEVELOPMENT OF THE CAPACITY FOR INTRINSIC MOTIVATION

The beauty of the IM system is that it too can develop to adapt to enormously diverse environments. In contrast to species with fixed action patterns that dictate its members' responses to specific types of situations, IM in humans is designed to allow our big brains the opportunity to sculpt this "seeking system" to highly varied activities, subject matter, and goals. Just as developmental experiences help shape other psychological systems (i.e., to improve our working models of attachment and refine our emotional sensibilities), they can help us develop knowledge and skills that allow us to experience IM in highly varied task situations and within different culture contexts. We must view IM as an "epigenetic system" (Rutter, Moffitt, & Caspi, 2006), which allows humans to develop motivated engagement in diverse domains of expertise.

What develops in the development of IM includes competencies at multiple levels. The research we reviewed suggests that people can build domain specific skills that allow them to engage in an activity at higher degrees of challenge and complexity (Csikszentmihalyi, 1990). They can develop individual dispositional interests—enduring knowledge, skills, and emotional associations that support deeper, more stable engagement in an activity (Hidi & Renninger, 2006). They can also develop values, meanings, and personal or collective connections to an activity, which become integrated into the self and make the activity more congruent with

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one's goals and identity (Ryan & Deci, 2000). Development, then, can be a major determinant of IM.

Further, as young people move into adolescence, they have increased potential to control this development: to deliberately develop skills for regulation of the factors that shape IM (Lerner, 2002). As we said at the chapter outset, teens gain the potential to acquire meta-cognitive understanding and executive skills for controlling their psychological processes (Kuhn, 2009; Steinberg et al., 2006). But there is no guarantee a given youth will gain this control. Ordinary experience may not provide much impetus for developing these advanced levels of thinking. Klaczynski (2004) argues that in daily life, people do most of their thinking using expedient mental shortcuts and heuristics.

What is especially important about IM is that (as reviewed in Section II) it is a state in which adolescents are likely to activate these meta-cognitive and executive skills. They are more likely to process information at deeper levels: asking questions, processing meaning, engaging in more expansive, and integrative reasoning. We suggest then that IM is a state in which this deeper thinking is likely to include analysis and synthesis that helps them understand the determinants of their motivation and develop skills for regulating it.

Research suggests that this happens for many youth. Renninger (2010) observed that high-school students with well-developed interests were able to weigh and choose between competing goals, identify obstacles, and regulate their work to sustain engagement in their domain of interest. We suspect that adolescents are capable of learning to read the emotional cues of boredom and anxiety to adjust a task to keep themselves in a channel of IM. We also propose that adolescents have the potential to learn general skills for self-regulation of motivation that—with effort—can be transferred from one activity to another.

Of course, just because there is "potential" for these differing components of IM to develop in adolescence, it does not mean that they will. They can fail to develop or start to develop and be "snuffed out". This turns us to the urgency of our next topic.

IV. How Youth Professionals Can Support the Development of Intrinsic Motivation

A. PROMISE AND CHALLENGE

Many adults think of motivation as binary (Renninger, 2010): Either a young person is self-motivated or not—and, if not, may never be. The

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important message of the research just reviewed is that IM is not "all or nothing"; it can change and grow. It is influenced by a constellation of determinants, many of which can be cultivated. In our study of effective youth programs, 44 out of 100 youth reported marked increases in their motivation (Dawes & Larson, 2011). They grew to be more deeply engaged, including "loving" program activities in ways described by Ron and Sheri.

For youth professionals, however, dealing with young people who are unmotivated is by no means easy. Just as the determinants of IM is complex, so are the means to cultivating it. In fact, attempts to induce youth's motivation can have the opposite effect (Ryan & Deci, 2003). A dilemma for educators is that for youth to become intrinsically motivated (i.e., self-motivated), the change has to come at least partly from the youth themselves. Research cannot provide formulas for these and the many kinds of dilemmas encountered in youth practice (Larson & Walker, 2010). But what the research just reviewed does suggest are principles about what shapes youth's IM (see Table I) that can be applied across situations. In this section, we discuss how these principles can be adapted to the realities of practice.

Rather than starting with youth's immediate motivation (or lack thereof), we first examine what the research suggests about practitioners' roles in cultivating environments that provide conditions for IM to develop. Second, we discuss approaches to helping youth build interest in and personal connections to learning activities. With this background, we next examine how professionals can support youth's immediate, ongoing experiences of IM. At the end, we explore the question of helping youth develop skills for managing their *own* motivation.

B. CULTIVATING ENVIRONMENTS THAT INVITE AND MODEL ENGAGEMENT

When youth first walk into a program or classroom, the environment they encounter begins to influence their future motivation. The social climate, activity structures, and norms of the setting, among other elements, begin to create a foundation for youth's future engagement.

1. Motivating Environments

The *social environment* is critical. Research has shown that youth's motivation depends in part on whether their psychological need for connection is addressed (Principle 1). When a youth walks in the door, a

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Table I
Principles for Cultivating Intrinsic Motivation Based on the Research

Practitioner goals	Principles from the research (Roman Numerals identify the section in the text in which each principle is discussed)
Cultivating environments that invite and model engagement	*Principle 1*. IM is more likely when youth experience relationships of trust and support. (IIIC) *Principle 2*. IM is more likely in environments that provide youth opportunities for experiencing competency and developing mastery. (IIIC) *Principle 3*. IM is more likely when youth experience volition in meaningful activities. (IIIC) *Principle 4*. IM is most likely to continue in activities in which youth can experience gradations of increasingly difficult challenges. (IIIB) *Principle 5*. IM is more frequent in settings in which youth experience clear goals and models of action (techniques, guidelines, rules) for reaching those goals. (IIIB)
Helping youth develop interest and make personal connections to an activity	*Principle 6*. IM develops as youth gain knowledge, skills, and positive emotional associations to the activity or content area. (IIIC) *Principle 7*. IM is greater when an activity is connected to youth's personal values, life goals, and identities. (IIIC)
Sustaining ongoing conditions for engaged attention	*Principle 8*. IM is greater when youth receive accurate and authentic feedback on product and process of work. (IIIB) *Principle 9*. To experience IM youth need to be engaged by challenges that are matched to their skills. (IIIB)
Facilitating development of skills for managing motivation	*Principle 10*. Educators can facilitate youth's development of skills for managing motivation by helping them gain conscious awareness of motivational processes, how their thoughts and actions influence these processes, and how skills for managing motivation can be transferred to other contexts. (IVE)

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welcoming atmosphere influences whether he or she connects with the group and wants to return.[3] At a deeper level, a culture of interpersonal trust and support (both youth–youth and youth–staff) creates a foundation for youth's future development of collaborative working relationships (Rhodes, 2004) in which IM is experienced not just individually but collectively (Pearce & Larson, 2006).

The *task environment* is also critical. To facilitate IM, the setting needs to provide structures that support youth's work and learning. Research indicates that structures in the setting should provide opportunities for youth's ongoing experiences of competence and volition (Principles 2 and 3); this includes opportunities for experiencing competence in increasingly challenging activities (Principle 4). In addition, research suggests that IM is more frequent in settings in which the models for action include clear goals and models of action techniques (including techniques, guidelines, rules) for reaching those goals (Principle 5). Additional elements of motivating environments are summarized by Kaplan and Maehr (2007).

The difficult question, however, is how youth professionals can create social and task environments with these features. Part of the challenge is that a number of these features involve norms that are only meaningful if they are shared by all youth; and adults cannot just impose a normative order, especially on adolescents. Youth must buy in. Let us provide an example of how this was done successfully.

2. Cultivating a Motivating Environment: An Illustration

Several weeks before the Computer Clubhouse first officially opened, there was a "soft launch" that involved a smaller pilot group of youth. This after-school program was designed for 12–18-year-olds, and its aim is to engage youth's natural interest in art, animation, robotics, and other areas as a means for them to develop technical and broader skills (Rusk, Resnick, & Cooke, 2009). The pilot youth were asked to try out equipment in order to help staff figure out what types of projects might be interesting to create. For example, a couple of youth were asked to try out the image scanner and they experimented with digitizing their photos and drawings. Youth were given a lot of autonomy but were also playing a role in starting to develop the models for future youth in the program, including models of how youth and adults interact.

[3]For some older youth, caring may be less important than trust and respect. Halpern (2005) described how youth in apprenticeship programs were highly motivated in "matter of fact" professional relationships with an adult expert.

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As a result, when the full set of youth joined on opening day, the space was already active. The pilot youth were eagerly collaborating at computer stations around the room: editing images, recording music, and designing computer games. These teens invited new youth to join projects, or helped them start new ones. New youth saw the pilot youth's art and technology projects on the walls—examples that suggested a range of activities youth could try. A shared culture came into life, one that supported positive relationships, competency, youth volition, and other ways of acting and thinking that facilitated IM.

3. The Role of Youth

Peer-to-peer influence is powerful (Brown, Bakken, Ameringer, & Mahon, 2008). This kind of "soft opening" is one way to involve youth in jumpstarting a shared culture that supports IM. The pilot youth passed on a welcoming, trusting social environment, as well as a task environment with models of action. In other programs, a similar process occurs when veteran youth, returning from prior years, pass on norms and share what happened and how things were done in the past (Polman & Miller, 2010).

It is important to recognize that this transfer between youth is not a process of rote imitation or conformity. In a controlled study, Kitsantas, Zimmerman, and Cleary (2000) found that girls (ages 14–16 years) who watched a person throw darts perfectly 15 times in a row were not as motivated as those who watched the person improve their skills over successive trials. The girls who had watched the person improve were more likely to attribute their successful shots to strategy (rather than ability), and this attribution led them to their experiencing greater self-efficacy and intrinsic interest. What is transferred that stimulates IM is not simply behaviors, it is the mental process of engaging with the challenges of an activity.

4. The Role of Staff

Although peers are important, youth professionals play vital roles as well. In interviews, youth describe how program staff positively influence their motivation by cultivating welcoming and trusting relationships within programs, including both youth–adult and youth–youth relationships (Larson & Dawes, in press). At the Computer Clubhouse, the staff spent months in advance thinking through the social and task environment they wanted to cultivate among youth and staff (Rusk et al., 2009). Effective youth professionals are intentional in cultivating core working

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principles (Walker, Marczak, Blyth, & Bordon, 2005). Staff can also play an important role through modeling. Adults' demonstration of how they approach work, their expectations, values, and beliefs can be transmitted to youth and facilitate their IM (Bakker, 2005; Basom & Frase, 2004; Halpern, 2009). As a general pattern, effective youth professionals cultivate favorable conditions for IM that are then passed on from youth to youth.

C. HELPING YOUTH DEVELOP INTEREST AND MAKE PERSONAL CONNECTIONS

But the environment, of course, is not enough to spark motivation in all youth. They need to have interest in the activities or subject matter. Some adolescents are chronically bored across activities in their lives (Larson & Richards, 1991). In after-school programs, some youth arrive unable to identify or articulate anything that motivates them. When asked what interests them, they shrug their shoulders and say they don't know.

Interest theory helps us think about how immediate experiences, over time, can lead to youth's development of dispositional interest. It suggests that IM is likely to grow as function of youth's acquisition of knowledge, skills, and positive emotional associations to the activity or subject (Principle 6).

Stina Cooke, one of the founders of the Computer Clubhouse, provides a valuable illustration of how to apply this and related principles to cultivating youth's interest. Chay, a shy and withdrawn youth, was reluctant to talk with either youth or staff in the program. Stina observed Chay collecting images from a Web site and began to notice a theme: many of these images contained airplanes. She unobtrusively helped him with the printer when needed, and eventually he was comfortable enough to speak with her.

Surprisingly, one of the first things Chay said to her was, "You don't hate me?" Stina replied by drawing him out, and he explained his fears about being scorned for his ethnic background and immigrant status. This is a useful example of how emotions—including those hidden from view—can interfere with youth's engagement in a setting. By getting Chay to talk about his anxieties and reassuring him, Stina was able to begin to build the kind of interpersonal trust we just discussed that provides a safe space for engagement and exploration.

As trust grew, Stina asked Chay about his experience with airplanes. He explained that the first (and only) time he was in an airplane was when his family flew to the United States after his family's release from a refugee

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camp. Seeing that this was a personal theme, Stina suggested projects he might want to work on involving airplanes, such as an animation, video, or 3D model. Chay dove into creating on a 3D model of an airplane. This attracted the interest of another boy. The two decided to work together on a project and began developing a collaborative friendship. As Chay's work continued, his knowledge grew and emotional connections to the topic of airplanes strengthened. He was developing dispositional interest, and this helped him persist in the face of obstacles he encountered with the 3D design software.

This example illustrates how different types of support may be needed at different phases. Hidi and Renninger (2006) describe how, at initial stages, learners' interest may require more external support, including support for exploring their own ideas. In this case, Chay initially browsed Web sites to find images, and Stina encouraged him to experiment in areas that attracted his attention. When his interest in airplanes became more apparent, Stina provided options for pursuing this interest. As Chay started working on creating a project based on his interest, his need for feedback and support shifted as well. He moved from depending on supports in the environment for attracting his attention to a more established ongoing interest, persisting in pursuing a project over time. At later stages, learners' development of interest can benefit from constructive feedback and input on how to most effectively reach their goals (Renninger, 2010).

In this example, Stina helped Chay develop his interest through his immediate experiences in the activity. Educators can also help youth increase their motivation by supporting connections between the activity and youth's values, identities, or life goals (Principle 7). In our findings on youth programs, this occurred when staff helped youth see links between what they enjoyed in an activity and possible career goals (Rickman, 2009) or connections between the activity and societal values and injustices (Pearce & Larson, 2007).

D. SUSTAINING ONGOING CONDITIONS FOR ENGAGED ATTENTION

The young artists at Art-First experienced the favorable conditions we discussed thus far. The program provided an inviting environment that was rich in models of action. Youth also had no lack of interest: they had a well-developed base of knowledge and positive emotions; and they were excited that each would be painting a mural to be mounted on the metro platform. But the murals were bigger than any paintings they had

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done, creating anxiety. They soon discovered, too, that the metro authority had numerous rules that restricted use of their individual artistic styles in the murals. Other problems emerged: time was short, some youth got bored, and later their murals were vandalized (Larson & Walker, 2006).

This is where the real world comes in. Although real-world activities can be highly motivating, they also generate threats and obstacles to youth's motivation. Practitioners face the challenge of trying to sustain conditions for IM (such as that in Table I) in the face of this real-world complexity: How do they enable youth to find a "zone"—to be in a channel or "sweet spot"—in which the conditions for IM are maintained?

Welcome to the world of practice. Youth professionals carry out their work on a "rough ground" in which the real world is a continuous part of the terrain (Larson, Rickman, Gibbons & Walker, 2009). Across professions, practice involves navigating complex unfolding events and situations. Stuff happens. Often practitioners must try to *balance* multiple competing goals (Schwandt, 2003; Sternberg et al., 2000). For youth professionals, supporting youth's motivation is only *one* of many competing goals they must balance, including curricular, organizational, community, ethical, and developmental goals (Larson & Walker, 2010). Even when they have the luxury of focusing solely on youth's motivation, we have identified numerous determinants of IM at different levels of analysis that need to be taken into account. Sternberg (1998) articulates how the "balancing" of practitioners can take many forms, including weighing, integrating, and reconciling divergent concerns.[4] The expertise of youth practitioners lies partly in their skills for this balancing and navigation of multiple considerations in complex contexts (Larson & Walker, 2010). Let us highlight a few of the balancing acts that leaders of youth programs navigate in helping sustain youth's IM;

1. Balancing Youth's Volition with Providing Them Needed Assistance

Youth's experience of volition is fundamental to their experience of IM (Principle 3). Yet insufficient adult supervision can compromise youth's learning of skills (Kirshner, 2008), leave youth floundering, or result in their work heading in directions that are inconsistent with youth professionals' obligations to keep youth safe, satisfy stakeholders, and maintain positive community relationships (Camino, 2005; Ozer et al., 2008). Leaders negotiate a balancing act of supporting youth's volition while

[4]Smetana, Crean, and Campione-Barr (2005) suggest that effective parenting requires delicate balancing, referred to as "precision parenting" (p. 43), in which just the right parental input is provided to fit a particular child and situation.

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helping keep their work on track (Larson & Angus, 2011a,b). Even the simple process of providing input on youth's work can be experienced by youth as patronizing. Clear unadulterated feedback is important to IM (Principle 8)—as well as being vital to learning (Hattie & Timperley, 2007). Yet how do adults provide input (especially corrective feedback and process feedback) in ways that support rather than undercut youth's agency?

Effective youth professionals are skilled at this balancing act. We found that effective program leaders used "youth ownership" as a mantra—and youth reported that the freedom they experienced was an important factor in their motivation (Larson & Dawes, in press). Yet these leaders provided limited and judicious structure and input for youth's work in ways that sustained youth's experience of volition. They "led from behind." For example, rather than telling youth what to do, they would ask guiding questions—which kept responsibility for answering the questions with youth. At Art-First, they helped youth find ways to express themselves within the metro authority's constraints. We also found that youth valued leaders' input when they were stuck, needed help, or were headed in a wrong direction (Larson & Angus, 2011a,b). Rather than undercutting their volition, this help appeared to restore youth's sense of control. It helped restore conditions for IM and get them back in the zone of IM.

2. Helping Keep Challenges Matched to Youth's Skills

Another important balancing act of youth professionals is helping youth experience challenges matched to their skills (Principle 9). It is important to recognize that challenges come in heterogeneous forms. They involve not just subject matter content (as is typical in a school classes). In youth programs, they may involve unstructured problems, unfamiliar procedural steps, or managing complex interpersonal processes (e.g., group dynamics and emotions). Zeldin and Camino (1999) observed that inexperienced program leaders sometimes expect youth to handle tasks containing difficulties that even the leaders themselves could not handle.

We have already described several examples of advisors achieving this balance (e.g., by helping them break difficult tasks down into manageable pieces; or at SisterHood, responding to youth's boredom by helping youth take charge of group discussions). At Art-First, when youth felt panicked about the size and short timeline for their murals, the advisors helped them find shortcuts. When the match between challenges and skills was off, leaders helped youth get back into a zone (or "flow channel") that helped restore conditions for IM.

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3. Additional Balancing Acts

Research suggests other motivational puzzles that skilled leaders navigate. One involves limited but *adroit use of extrinsic rewards*. Research shows that rewards can undermine IM, but in specific situations they can be helpful. These include to initiate the engagement of someone whose initial motivation is low and to get people through boring tasks (Covington, 2002). Another balancing act concerns *appropriate use of praise*. If excessive and indiscriminate, praise can be harmful to motivation; but it can be useful in situations where it provides recognition for effort (Mueller & Dweck, 1998) and when the rewards provide information and do not compromise a person's self-control of their actions (Deci et al., 1999). Youth also report that encouragement from leaders is helpful when they experience self-doubt and when the leaders help them envision where their work is headed. Another balancing act that youth said supported their motivation was the leaders' *balancing of serious work with fun* (Larson & Dawes, in press). Of course, for all of these, timing is critical: judging when youth need a particular type of input to bring them back into their zone of IM.

Because of their experience, youth professionals are in a position to see and balance diverse considerations that may influence youth's motivation. It is worth noting that balancing multiple competing considerations is something that adults generally do better than adolescents (Byrnes, Miller, & Reynolds, 1999).

E. FACILITATING YOUTH'S DEVELOPMENT OF SKILLS FOR MANAGING INTRINSIC MOTIVATION

Let us introduce one more practitioner balancing act that is important at more advanced stages of motivational development. The youth at Art-First were experienced painters with well-developed interest, but the goals of the program advisor, Rebecca, entailed more than just sustaining this passion; it including getting youth "out of their comfort zone." The aim was to move youth from the fun of painting for its own sake to learn about real-world experiences associated with careers in the arts. This included youth learning to manage challenges, such as the boredom, frustration, and anxiety that come with the territory. Rebecca did not want to entirely ignore youth's aversive experiences, and risk having them quit. But her goals were to *balance concern with sustaining their short-term motivation with creating conditions for them to learn to manage ups and downs in their motivation*.

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Indeed the restrictions on the Art-First murals undercut youth's enthusiasm. So Rebecca kept reminding them that this is art in the real world. Given the youth's well-developed interest, they were perseverant and adapted to the restrictions: One reported, "Everyone realized we're here to do a job; it's not like summer camp or anything." Enthusiasm returned. A similar cycle of adaptation followed youth's devastating experience of having their completed murals vandalized. Rebecca responded by creating a class on art restoration in which youth not only repaired the murals but also reported learning a powerful lesson in resiliency (Larson & Walker, 2006). Youth were learning to regulate their motivational states. They were deploying their adolescent meta-cognitive potentials to develop executive skills for managing challenging real-world threats.

A valuable role of leaders in facilitating this learning is helping youth develop conscious awareness of strategies for managing their own motivation (Principle 10; Wolters, 2003). This can involve talking with youth as they plan their work, for example, interjecting questions about possible turns of events they might want to consider (Heath, 1999). It can also involve helping them stand back and reflect on their recent and past experiences (Priest & Gass, 1997).

Research suggests several topics of conversation that may be particularly useful in helping youth learn to manage their IM. First, the most important message for youth (as for practitioners) is that *motivation can change and develop over time*. Something you are not currently interested in may become more interesting later. And, one interest can lead to another.

A second important topic of talk with youth about motivation is *the process of goal setting*. A large body of research indicates that youth benefit when they learn to focus on improvement goals rather than comparison to others. Cultivating a mindset focused on the rewards of learning leads to more persistence after setbacks or failure (Blackwell, Trzesniewski, & Dweck, 2007). Research shows that people benefit from learning to set concrete attainable goals (rather than just "do your best") (Latham & Seijts, 1999). Research shows that even in long-term projects, youth should learn to focus on shorter-range goals, because they are more easy to control and, thus, more motivating (Bandura, 1997; Bandura & Schunk, 1981).

A third important topic of conversation involves *strategies for reaching goals in complex real-world contexts*. This includes helping youth anticipate potential obstacles (including motivational obstacles) and strategies for avoiding or problem solving when one encounters them. The effectiveness of this was demonstrated in an intervention in which high-school students planned for what they would do when they encountered obstacles

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to achieving their academic goals (Oyserman, Bybee, & Terry, 2006). Students were asked to draw future timelines for themselves that included possible forks in the road and obstacles. As described by the researchers, "The metamessage was 'everyone has difficulties, and failures and setbacks are a normal part of timelines'" (pp. 191). Youth should not interpret setbacks as a sign that they are not competent and should give up. Youth in this intervention showed declines in school absences and behavioral problems and improvements in academic initiatives, test scores, and grades—with effects sustained in a 2-year follow-up. In a separate study, Gollwitzer and Brandstätter (1997) found that students were three times more likely to reach difficult goals when they had thought about *how* and *when* they would implement their goals.

A fourth topic is helping youth reflect on how the strategies they learn about managing motivation can be *transferred to other contexts*. Research in learning science repeatedly shows that learners often fail to transfer new knowledge and skills across settings, but that educators can help by assisting them in thinking through how new knowledge and skills can be translated across diverse situations (Pugh & Bergin, 2006).

In concluding this section, we want to repeat our underlying themes that motivation is complex and that practice is more nuanced than researchers (including ourselves) and policy makers can do justice to. In fact, academics' theories can have negative effects if they are applied to practice without consideration to the real world of practice. Effective practice is an art. It entails balancing the consideration of numerous factors in a given context. Supporting youth's development of their capacity for IM—for deep engaged attention—requires both restraint and tenacity to adapt and persevere through the ups and downs of youth's experiences, as illustrated by Stina Cooke and the many other expert educators we have learned from. At a higher level, policy makers and administrators of youth serving organizations need to create institutional environments that support front-line staffs' development of skills and exercise of flexibility to adapt these principles to individual youth and ongoing motivational situations.

V. Conclusions: Combining Intrinsic Motivation and Positive Development

This chapter has focused on IM as a system that can catalyze learning and development but has said little about learning and development of what? The research indicates that IM mobilizes effective, efficient, and

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self-sustaining attention—also that given the plasticity of the human brain, the content toward which this attention is directed can vary widely across people as a function of their experiences. Much prior research has focused on IM and school learning, but at the end of Section II, we provided qualitative evidence on how IM can catalyze youth's engagement with psycho-social challenges that led to their development of emotional skills, responsibility, and insights on how to regulate their cognitive biases. Certainly, episodes of IM could also fuel development in the many other areas of positive development discussed in the volume. At the same time, theorists also caution that IM is not inherently oriented to learning only prosocial behavior: it is argued that, under certain conditions, malevolent activities can be intrinsically rewarding and IM can catalyze development of Machiavellian and criminal skill sets (e.g., Csikszentmihalyi, 1990).

Practitioners, researchers, and other adults, therefore, have common cause in cultivating IM around prosocial goals and life purposes. This leads to another set of balancing acts, for example, that of facilitating youth's experience of IM in computer activities, while discouraging pirating and malicious hacking, or supporting youth's personal connection to a just cause, yet helping them learn to manage the cognitive biases and insensitivity to other viewpoints that strong beliefs and passions can create (Kirshner et al., under review; Youniss, 2009). Although the goal of supporting IM is to help youth develop increased control over their motivation, this does not mean it should be encouraged in a vacuum. Positive development is most likely when it occurs in a context of positive relationships, institutions, communities, and value traditions (Benson, Scales, Hamilton, & Sesma, 2006; Youniss, 2009).

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REFERENCES

Ainley, M., Hidi, S., & Berndorff, D. (2002). Interest, learning and the psychological processes that mediate their relationship. *Journal of Educational Psychology*, *94*, 545–561.

Alcaro, A., Huber, R., & Panksepp, J. (2007). Behavioral functions of the mesolimbic dopaminergic system: An affective neuroethological perspective. *Brain Research Reviews*, *56*, 283–321.

Amabile, T. M. (1983). Social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, *45*, 357–376.

Author's personal copy

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *The American Psychologist*, *55*, 469–480.

Bakker, A. B. (2005). Flow among music teachers and their students: The crossover of peak experiences. *Journal of Vocational Behavior*, *66*, 26–44.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Bandura, A., & Schunk, D. (1981). Cultivating competence, self-efficacy and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology*, *41*, 586–598.

Basom, M. R., & Frase, L. (2004). Creating optimal work environments: Exploring teacher flow experiences. *Mentoring and Tutoring*, *12*, 241–258.

Benson, P. L., Scales, P., Hamilton, S., & Sesma, A. (2006). Positive youth development: Theory, research and applications. In W. Damon & R. M. Lerner (Eds.), *Theoretical models of human development Vol. 1. Handbook of Child Psychology*. (6th ed., pp. 894–941). NJ: Wiley.

Berlyne, D. E. (1966). Curiosity and exploration. *Science*, *153*, 25–33.

Bjorklund, D. F., & Ellis, B. J. (2005). Evolutionary psychology and child development: An emerging synthesis. In B. J. Ellis & D. F. Bjorklund (Eds.), *Origins of the social mind: Evolutionary psychology and child development*. (pp. 3–18). New York: Guilford.

Blackwell, L., Trzesniewski, K., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*, 246–263.

Brown, B. B., Bakken, J. P., Ameringer, S. W., & Mahon, S. D. (2008). A comprehensive conceptualization of the peer influence process in adolescence. In M. J. Prinstein & K. Dodge (Eds.), *Peer influence processes among youth*. (pp. 17–44). New York: Guildford.

Bruner, J. S. (1966). *Toward a theory of instruction.* Cambridge, MA: Harvard University Press.

Byrnes, J. P., Miller, D. C., & Reynolds, M. (1999). Learning to make good decisions: A self-regulation perspective. *Child Development*, *70*, 1121–1140.

Camino, L. (2005). Pitfalls and promising practices of youth-adult partnerships: An evaluator's reflections. *Journal of Community Psychology*, *33*, 75–85.

Covington, M. V. (2002). Rewards and intrinsic motivation: A needs-based, developmental perspective. In F. Pajares & T. Urdan (Eds.), *Academic motivation of adolescents*. (pp. 169–192). Greenwich, CT: IAP.

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety.* San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience.* New York: HarperPerennial.

Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention.* New York: HarperCollins.

Csikszentmihalyi, M., & Larson, R. (1984). *Being adolescent.* New York: Basic Books.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure.* New York: Cambridge University Press.

Cury, F., Elliot, A. J., Da Fonseca, D., & Moller, A. (2006). The social–cognitive model of achievement motivation and the 2 X 2 achievement goal framework. *Journal of Personality and Social Psychology*, *90*, 666–679.

Damon, W. (2008). *Path to purpose: Helping our children find their calling in life.* NY: Free Press.

Daniels, L. M., Stupnisky, R. H., Pekrun, R., Haynes, T. L., Perry, R. P., & Newall, N. E. (2009). A longitudinal analysis of achievement goals: From affective antecedents to emotional effects and achievement outcomes. *Journal of Educational Psychology*, *101*, 948–963.

Author's personal copy

Dawes, N. P. & Larson, R. W. (2011). How youth get engaged: Grounded-theory research on motivational development in organized youth programs. *Developmental Psychology*, *47*, 259–269.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, *125*, 627–668.

Dewey, J. (1913). *Interest and effort in education.* Carbondale, IL: Southern Illinois University Press.

Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development.* Philadelphia: Psychology Press.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, *95*, 256–273.

Eccles, J. S. (2005). Studying gender and ethnic differences in participation in math, physical science, and information technology. *New Directions for Child and Adolescent Development*, *110*, 7–14.

Eccles, J. S. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist*, *44*, 78–89.

Eccles, J. S., & Roeser, R. W. (2009). Schools, academic motivation, and stage-environment fit. In R. M. Lerner & L. Steinberg (Eds.). *Handbook of adolescent psychology* (3rd ed., Vol. 1, pp. 404–434). Hoboken, NJ: Wiley.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *The American Psychologist*, *56*, 218–226.

Gollwitzer, P. M., & Brandstätter, V. (1997). Implementation intentions and effective goal pursuit. *Journal of Personality and Social Psychology*, *73*, 186–199.

Grolnick, W. S., Farkas, M. S., Sohmer, R., Michaels, S., & Valsiner, J. (2007). Facilitating motivation in young adolescents: Effects of an after-school program. *Journal of Applied Developmental Psychology*, *28*, 332–334.

Grolnick, W. S., & Ryan, R. M. (1987). Autonomy in children's learning: An experimental and individual difference investigation. *Journal of Personality and Social Psychology*, *52*, 890–898.

Halpern, R. (2005). Instrumental relationships: A potential relational model for inner-city youth programs. *Journal of Community Psychology*, *33*, 11–20.

Halpern, R. (2009). *The means to grow up: Reinventing apprenticeship as a developmental support in adolescence.* Chicago: Routledge.

Hansen, D. M., & Larson, R. W. (2007). Amplifiers of developmental and negative experiences in organized activities: Dosage, motivation, lead roles, and adult-youth ratios. *Journal of Applied Developmental Psychology*, *28*, 360–374.

Harackiewicz, J. M., Barron, K. E., Tauer, J. M., Carter, S. M., & Elliot, A. J. (2000). Short-term and long-term consequences of achievement: Predicting continued interest and performance over time. *Journal of Educational Psychology*, *92*, 316–330.

Harackiewicz, J. M., Durik, A. M., Barron, K. E., Linnenbrink-Garcia, 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.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*, 81–112.

Heath, S. B. (1999). Dimensions of language development: Lessons from older children. In A. S. Masten (Ed.), *Cultural processes in child development: The Minnesota symposium on child psychology* (Vol. 29, pp. 59–75). Mahwah, NY: Erlbaum.

Author's personal copy

Hennessey, B. A. (2000). Rewards and creativity. In C. Sansone & J. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 55–78). New York: Academic Press.

Hidi, S. (2000). An interest researcher's perspective: The effects of extrinsic and intrinsic factors on motivation. In C. Sansone & J. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance*. (pp. 311–342). NY: Academic.

Hidi, S. (2001). Interest, reading and learning: Theoretical and practical considerations. *Educational Psychology Review*, *13*, 191–210.

Hidi, S. (2006). Interest: A motivational variable with a difference. *Educational Research Review*, *1*, 69–82.

Hidi, S., & Harackiewicz, J. (2000). Motivating the academically unmotivated: A critical issue for the 21st century. *Review of Educational Research*, *70*, 151–179.

Hidi, S., & Renninger, A. (2006). The four-phase model of interest development. *Educational Psychologist*, *41*, 111–127.

Hoffmann, L. (2002). Promoting girls' learning and achievement in physics classes for beginners. *Learning and Instruction*, *12*, 447–465.

Isen, A. M. (2000). Positive affect and decision making. In M. Lewis & J. Haviland-Jones (Eds.), *Handbook of emotions*. (2nd ed., pp. 417–435). New York: Guilford.

Izard, C. E., & Ackerman, B. P. (2000). Motivational, organizational, and regulatory functions of discrete emotions. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions*. (2nd ed., pp. 253–264). New York: Guilford.

Kandel, E. (2007). *In search of memory: The emergence of a new science of mind.* New York: Norton.

Kaplan, A., & Maehr, M. (2007). The contributions and prospects of goal orientation theory. *Educational Psychology Review*, *19*, 141–184.

Kirshner, B. (2008). Guided participation in three youth activism organizations: Facilitation, apprenticeship, and joint work. *The Journal of the Learning Sciences*, *17*, 60–101.

Kirshner, B., Pozzoboni, K., & Jones, H. (in press). Learning how to manage bias: A case study of youth participatory action research. *Applied Developmental Science*.

Kitsantas, A., Zimmerman, B., & Cleary, T. (2000). The role of observation and emulation in the development of athletic self-regulation. *Journal of Educational Psychology*, *91*, 241–250.

Klaczynski, P. A. (2004). A dual-process model of adolescent development: Implications for decision making, reasoning, and identity. In R. V. Kail (Ed.), *Advances in child development and behavior* (Vol. 31, pp. 73–123). San Diego, CA: Academic Press.

Koestner, R., Ryan, R. M., Bernieri, F., & Holt, K. (1984). Setting limits on children's behavior: The differential effects of controlling versus informational styles on intrinsic motivation and creativity. *Journal of Personality*, *52*, 233–248.

Köller, O., Baumert, J., & Schnabel, K. (2001). Does interest matter? The relationship between academic interest and achievement in mathematics. *Journal for Research in Mathematics Education*, *32*, 448–470.

Krapp, A. (1999). Interest, motivation, and learning: An educational-psychological perspective. *Learning and Instruction*, *14*, 23–40.

Kuhn, D. (2009). Adolescent thinking. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (3rd ed., Vol. 1, pp. 152–186). Hoboken, NJ: Wiley.

Larson, R. W. (2000). Toward a psychology of positive youth development. *The American Psychologist*, *55*, 170–183.

Larson, R. W. (2011). Positive development in a disorderly world. *Journal of Research on Adolescence*, *21*, 317–334.

Author's personal copy

Larson, R. W., & Angus, R. M. (2011a). Adolescents' development of skills for agency in youth programs: Learning to think strategically. *Child Development*, *82*, 277–294.

Larson, R. W., & Angus, R. (2011b). Pursuing paradox: The role of adults in creating empowering settings for youth. In M. Aber, K. Maton & E. Seidman (Eds.), *Empowering settings and voices for social change* (pp. 65–93). New York: Oxford.

Larson, R. W., & Brown, J. R. (2007). Emotional development in adolescence: What can be learned from a high school theater program. *Child Development*, *78*, 1083–1099.

Larson, R. W. & Dawes, N. P. (in press). Cultivating intrinsic motivation in American youth programs: Challenges and paradoxes navigated by youth professionals. In M. Csikszentmihalyi (Ed.), *Education and youth development in cross-cultural perspective: Contributions from positive psychology*. New York: Springer.

Larson, R. W., Jensen, L., Kang, H., Griffith, A., & Rompala, V. (in process). Peer groups as a crucible of positive value development in a global world. In G. Trommsdorff & X. Chen (Eds.), *Values, religion, and culture in adolescent development*. Cambridge: Cambridge Press.

Larson, R. W., & Richards, M. (1991). Boredom in the middle school years: Blaming schools versus blaming students. *American Journal of Education*, *91*, 418–443.

Larson, R. W., Rickman, A. N., Gibbons, C. M., & Walker, K. C. (2009). Practitioner expertise: Creating quality within the daily tumble of events in youth settings. *New Directions for Youth Development*, *121*, 71–88.

Larson, R. W., & Walker, K. (2006). Learning about the "real world" in an urban arts program. *Journal of Adolescent Research*, *21*, 244–268.

Larson, R. W., & Walker, K. C. (2010). Dilemmas of practice: Challenges to program quality encountered by youth program leaders. *American Journal of Community Psychology*, *45*, 338–349.

Latham, G. P., & Seijts, G. H. (1999). The effects of proximal and distal goals on performance on a moderately complex task. *Journal of Organizational Behavior*, *20*, 421–429.

Lavigne, G. L., & Vallerand, R. J. (2010). The dynamic processes of influence between contextual and situational motivation: A test of the hierarchical model in a science education setting. *Journal of Applied School Psychology*, *40*, 2343–2359.

Lavigne, G. L., Vallerand, R. J., & Miquelon, P. (2007). A motivational model of persistence in science education: A self-determination theory approach. *European Journal of Psychology of Education*, *22*, 351–369.

Lenhart, A., Arafeh, S., Smith, A., & Macgill, A. (2008). Writing, technology, and teens. *PEW Internet and the American Life Project*—Retrieved from http://www.pewinternet.org/Reports/2008/Writing-Technology-and-Teens.aspx.

Lepper, M. R., Corpus, J. H., & Iyengar, S. S. (2005). Intrinsic and extrinsic motivational orientations in the classroom: Age differences and academic correlates. *Journal of Educational Psychology*, *97*, 184–196.

Lepper, M., & Henderlong, J. (2000). Turning "play" into "work" and "work" into "play": 25 years of research into intrinsic vs. extrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 257–307). New York: Academic.

Lepper, M. R., Sethi, S., Dialdin, D., & Drake, M. (1997). Intrinsic and extrinsic motivation: A developmental perspective. In S. S. Luthar, J. A. Burack, D. Cicchetti & J. R. Weisz (Eds.), *Developmental psychopathology: Perspectives on adjustment, risk, and disorder* (pp. 23–50). New York: Cambridge University Press.

Lerner, R. (2002). *Concepts and theories of human development* Mahwah, NJ: Erlbaum.

Author's personal copy

Lerner, J. V., Phelps, E., Forman, Y., & Bowers, E. (2009). Positive youth development. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (3rd ed., Vol. 1, pp. 524–558). Hoboken, NJ: Wiley.

Magnifico, A. M. (2010). Writing for whom? Cognition, motivation, and a writer. *Educational Psychologist*, *45*, 167–184.

Mahoney, J. L., Parente, M. E., & Lord, H. (2007). Program-level differences in afterschool program engagement: Links to child competence, program quality and content. *The Elementary School Journal*, *107*, 385–404.

Malone, T. W. (1980). What makes things fun to learn? Heuristics for designing instructional computer games. In *Proceedings of the 3rd ACM SIGSMALL Symposium and the First SIGPC Symposium on Small Systems* (pp. 162–169). Palo Alto, CA: ACM Press.

Mariano, J. M., & Going, J. (2011). Youth purpose and positive youth development. *Advances in Child Development and Behavior*, *41,* 37–66.

Markus, H. R., & Kitayama, S. (2003). Models of agency: Sociocultural diversity in the construction of action. In *Nebraska Symposium on Motivation*, Lincoln, NB: Nebraska University Press.

Massimini, F., Csikszentmihalyi, M., & Delle Fave, A. (1988). Flow and biocultural evolution. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness*. (pp. 60–81). Cambridge: Cambridge Press.

Mayr, E. (2001). *What evolution is.* New York: Basic Books.

Moneta, G. B., & Csikszentmihalyi, M. (1996). The effect of perceived challenges and skills on the quality of subjective experience. *Journal of Personality*, *64*, 275–331.

Mueller, C. M., & Dweck, C. S. (1998). Intelligence praise can undermine motivation and performance. *Journal of Personality and Social Psychology*, *75*, 33–52.

Nakamura, J., & Csikszentmihalyi, M. (2009). Flow theory and research. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology*. (2nd ed., pp. 195–206). New York: Oxford.

Nasir, N. S., & Hand, V. (2008). From the court to the classroom: Opportunities for engagement, learning and identity in basketball and classroom mathematics. *The Journal of the Learning Sciences*, *17*, 143–180.

Newell, A., & Simon, H. (1972). *Human problem solving.* Englewood Cliffs, NJ: Prentice Hall.

Oyserman, D., Bybee, D., & Terry, K. (2006). Possible selves and academic outcomes: How and when possible selves impel action. *Journal of Personality and Social Psychology*, *91*, 188–204.

Ozer, E. J., Cantor, J. P., Cruz, G. W., Fox, B., Hubbard, E., & Moret, L. (2008). The diffusion of youth-led participatory research in urban schools: The role of the prevention support system in implementation and sustainability. *American Journal of Community Psychology*, *41*, 278–289.

Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotion.* New York: Oxford University Press.

Pearce, N., & Larson, R. (2006). The process of motivational change in a civic activism organization. *Applied Developmental Science*, *10*, 121–131.

Pearce, N. J., & Larson, R. (2007). How youth become engaged in youth programs: The process of motivational change. *Applied Developmental Science*, *10*, 121–131.

Pelletier, L. G., Séguin-Lévesque, C., & Legault, L. (2002). Pressure from above and pressure from below as determinants of teachers' motivation and teaching behaviors. *Journal of Educational Psychology*, *94*, 186–196.

Piaget, J. (1971). *Biology and knowledge.* Chicago: University of Chicago Press.

Author's personal copy

Pintrich, P. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, *82*, 33–40.

Polman, J. L., & Miller, D. (2010). Changing stories: Trajectories of identification among African American youth in a science outreach apprenticeship. *American Educational Research Journal*, *47*, 879–918.

Priest, S., & Gass, M. A. (1997). *Effective leadership in adventure programming.* Champaign, IL: Human Kinetics.

Pugh, K. J., & Bergin, D. A. (2006). Motivational influences on transfer. *Educational Researcher*, *41*, 147–160.

Purcell-Gates, V., Duke, N. K., & Martineau, J. A. (2007). Learning to read and write genre-specific text: Roles of authentic experience and explicit teaching. *Reading Research Quarterly*, *42*, 8–45.

Renninger, K. A. (2010). Working with and cultivating the development of interest, self-efficacy, and self-regulation. In D. D. Preiss & R. J. Sternberg (Eds.), *Innovations in educational psychology: Perspectives on learning, teaching, and human development* (pp. 107–138). New York: Springer.

Rhodes, J. E. (2004). The critical ingredient: Caring youth–staff relationships in after-school settings. *New directions in youth development: After-school worlds*, *101*, 145–161.

Rickman, A. N. (2009). *A challenge to the notion of youth passivity: Adolescents' development of career direction through youth programs.* Unpublished Masters Equivalency, University of Illinois.

Rusk, N., Resnick, M., & Cooke, S. (2009). Origins and guiding principles of the Computer Clubhouse. In Y. Kafai, K. Peppler & R. Chapman (Eds.), *The Computer Clubhouse: Constructionism and creativity in youth communities* (pp. 17–25). New York: Teachers College Press.

Rutter, M., Moffitt, T., & Caspi, A. (2006). Gene-environment interplay and psychopathology: Multiple variables but real effects. *Journal of Child Psychology and Psychiatry*, *47*, 226–261.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American Psychologist*, *55*, 68–78.

Ryan, R. M., & Deci, E. L. (2003). On assimilating identities to the self: A self-determination theory perspective on internalization and integrity within cultures. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 255–273). New York: Guilford.

Ryan, R. M., & Deci, E. L. (2008). Self-determination theory and the role of basic psychological needs in personality and the organization of behavior. In O. P. John, R. W. Robbins & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 654–678). New York: Guilford.

Ryan, R. M., & Deci, E. L. (2009). Promoting self-determined school engagement: Motivation, learning, and well-being. In K. R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation in school* (pp. 171–196). New York: Taylor Francis.

Sansone, C., & Harackiewicz, J. (Eds.), (2000). *Intrinsic and extrinsic motivation: The search for optimal motivation and performance*. New York: Academic Press.

Sansone, C., & Smith, J. L. (2000). Interest and self-regulation: The relation between having to and wanting to. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 341–372). New York: Academic.

Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist*, *26*, 299–323.

Schiefele, U. (1996). Topic interest, text representation, and quality of experience. *Contemporary Educational Psychology*, *21*, 3–18.

Author's personal copy

Schiefele, U. (1999). Interest and learning from text. *Scientific Studies of Reading*, *3*, 257–280.

Schiefele, U., Krapp, A., & Winteler, A. (1992). Interest as a predictor of academic achievement: A meta-analysis of research. In K. A. Renninger, S. Hidi & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 183–212). Hillsdale, NJ: Erlbaum.

Schneider, B., & Stevenson, H. (1999). *The ambitious generation: America's teenagers, motivated but directionless.* New Haven, CT: Yale University Press.

Schwandt, T. A. (2003). Back to the rough ground: Beyond theory to practice in evaluation. *Evaluation*, *9*, 353–364.

Seamans, J. K., & Robbins, T. W. (2010). Dopamine modulation of the prefrontal cortex and cognitive function. In K. A. Neve (Ed.), *The dopamine receptors*. (2nd ed., pp. 373–398). New York: Humana Press.

Shernoff, D. (2010). Engagement in after-school programs as a predictor of social competence and academic performance. *American Journal of Community Psychology*, *45*, 325–337.

Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly*, *18*, 158–176.

Shirey, L. L., & Reynolds, R. E. (1988). Effect of interest on attention and learning. *Journal of Educational Psychology*, *80*, 159–166.

Simpkins, S. D., Davis-Kean, P. E., & Eccles, J. S. (2006). Math and science motivation: A longitudinal examination of the links between choices and beliefs. *Developmental Psychology*, *42*, 70–83.

Smetana, J. G., Crean, H. F., & Campione-Barr, N. (2005). Adolescents' and parents changing conceptions of parental authority. *New Directions for Child and Adolescent Development*, *108*, 31–46.

Soenens, B., Vansteenkiste, M., Lens, W., Luyckx, K., Goossens, L., Beyers, W., et al. (2007). Conceptualizing adolescent perceptions of parental autonomy support: Adolescent perceptions of promoting independence versus promoting volitional functioning. *Developmental Psychology*, *43*, 633–646.

Steinberg, L., Dahl, R., Keating, D., Kupfer, D. J., Masten, A. S., & Pine, D. S. (2006). The study of developmental psychopathology in adolescence: Integrating affective neuroscience with the study of context. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology* (2nd ed., Vol. 2, pp. 710–741). New York: Wiley.

Sternberg, R. J. (1998). A balance theory of wisdom. *Review of General Psychology*, *2*, 347–365.

Sternberg, R. J., Forsythe, G. B., Hedlund, J., Horvath, J. A., Wagner, R. K., Williams, W. M., et al. (2000). *Practical intelligence in everyday life.* Cambridge: Cambridge, UK.

Urdan, T. (2003). Intrinsic motivation, extrinsic rewards, and divergent views of reality. *Educational Psychology Review*, *15*, 311–325.

Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: The synergistic role of intrinsic goals and autonomy-support. *Journal of Personality and Social Psychology*, *87*, 246–260.

Walker, J., Marczak, M., Blyth, D., & Bordon, L. (2005). Designing youth development programs: Toward a theory of developmental internationality. In J. Mahoney, R. Larson & J. Eccles (Eds.), *Organized activities as contexts of development: Extracurricular activities, after-school and community programs*. (pp. 399–418). Mahwah, NJ: Lawrence Erlbaum.

Watkins, N., Larson, R., & Sullivan, P. (2007). Learning to bridge difference: Community youth programs as contexts for developing multicultural competencies. *The American Behavioral Scientist*, *51*, 380–402.

Author's personal copy

Wentzel, K. R. (2009). Students' relationships with teacher as a motivational context. In K. R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school*. (pp. 301–322). New York: Guilford.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, *66*, 297–333.

Wigfield, A., Eccles, J., Schiefele, U., Roeser, R., & Davis-Kean, P. (2006). Development of achievement motivation. In W. Damon, & R. M. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Social, emotional, and personality development* (Vol. 3, pp. 933–1002). New York: Wiley.

Wolters, C. A. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist*, *38*, 189–205.

Wood, D., Larson, R. W., & Brown, J. (2009). How adolescents come to see themselves as more responsible through participation in youth programs. *Child Development*, *80*, 295–309.

Wortham, S. (2006). *Learning identity: The joint emergence of social identification and academic learning.* New York: Cambridge University Press.

Youniss, J. (2009). When morality meets politics in development. *Journal of Moral Education*, *38*, 129–144.

Zeldin, S., & Camino, L. (1999). Youth leadership: Linking research and program theory to exemplary practice. *New Designs for Youth Development*, *15*, 10–15.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, *41*, 64–70.