

Chapter 9

Toward a Social Psychology of Assimilation: Self-Determination Theory in Cognitive Development and Education

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*But what is the true type of education?
It is like the art of the gardener under whose care
a thousand trees blossom and grow.
He contributes nothing to their actual growth;
the principle of growth lies in the trees themselves.
He plants and waters....*

(Pestalozzi, 1818)

Humans are curious, interested creatures, who naturally seek out novelty and challenge, enjoy learning, and actively internalize new practices and cultural values from others around them. These evolved tendencies to be curious (Silvia, 2008) and to assimilate (Piaget, 1971) would seem to be primary resources in the social promotion of learning and development (Niemi & Ryan, 2009). Yet, it is increasingly frequent in contemporary societies for parents and educators not to rely on these inherent propensities, but rather to try to ensure learning through external incentives and controls, often interfering with or crowding out intrinsic epistemic processes. Externally controlling motivators have been systemically extended to teachers as well. For example, in many nations policies link rewards and sanctions contingently on raising specific test scores (Ryan & Brown, 2005; Ryan & Weinstein, 2009). Under such controlling conditions, predictable changes in teaching practices occur that attempt to supplant active learning by assimilation with learning by externally controlled directives and goals.

It is particularly interesting in this regard that this chapter is occasioned by a common focus of Jean Piaget Society members and a few of us representatives of self-determination theory on autonomy and self-regulation in

cognitive and socioemotional development. Piagetian theory has long been focused on the development of cognitive structures through the inherent processes of organization. *Self-Determination Theory* (SDT; Deci & Ryan, 2000; Ryan & Deci, 2000b) in turn is an organismic theory focused on factors that facilitate or derail organizational or integrative processes across domains of development (Deci & Ryan, this volume; Ryan, 1993).

The dialectic between an active assimilative human nature and social contexts is of course nowhere more apparent and nowhere more important to understand than in the domain of education (Guay, Ratelle, & Chantal, 2008). This is a domain in which students' inherent propensities to learn represent perhaps the greatest resource an educator can tap, and yet it is also a domain where external controls, evaluations, and pressures are regularly imposed, often with the intent of "making" students learn, and in the process unwittingly undermining that very outcome (Ryan & Brown, 2005).

In what follows we describe some important elements of SDT as they apply to both learning as a natural developmental process and learning within the contexts of modern educational settings. We begin by examining the concept of *intrinsic motivation* – arguing that much of early cognitive and motor development is dependent on intrinsic motivation. Further intrinsic motivation can, and optimally does, play an important role in structured classroom environments, and we discuss factors that support or undermine it in classrooms.

Beyond intrinsic motivation we discuss *extrinsic motivation* and the process of its *internalization* as a critical element for learning and achievement. We argue that the process of internalization and integration of ambient social norms, values, and practices is itself natural, but like intrinsically motivated assimilation, it is highly dependent on supports for learners' psychological needs for autonomy, competence, and relatedness. When supports for these needs are afforded, greater intrinsic motivation and internalization follow; when these needs are thwarted, greater controlled motivation and more impoverished learning results. In this regard, we discuss the systemic conditions affecting teachers and learners that support or thwart their needs, and the consequences for motivational and assimilative processes. We conclude with a discussion of the interplay between motivation and cognitive development in theory and practice.

INTRINSIC MOTIVATION AND LEARNING

All work on the part of intelligence rests on interest. Interest is nothing other, in effect, than the dynamic aspect of assimilation. (Piaget, 1970, p. 158)

Intrinsic motivation refers to behaviors that are done because they are inherently interesting and enjoyable and that do not depend on external controls for their occurrence (Ryan & Deci, 2000a). When children play, explore, examine objects, and engage in new activities they are frequently intrinsically motivated – these actions emanate from the child and are sustained by the satisfactions of acting. In such behaviors the child is displaying what Piaget (1971) would have described as the inherent tendency of structures, once existing, to function, and thereby to extend themselves. But as Piaget (1981) also recognized, a phenomenological perspective supplements and enriches this structural account. He noted that the affective and experiential aspect of assimilation is *interest*. The child volitionally engages in such actions, finding them immersive, interesting, and fun.

Intrinsically motivated activities are in turn critical to the unfolding and refinement of cognitive structures and to the integration of knowledge (Deci & Ryan, 1985). As Flavell, Miller, and Miller (2002) stated, "a great deal of mentation, at all developmental levels, is intrinsically rather than extrinsically motivated" (p. 66). Indeed, much new learning in early childhood is intrinsically motivated, whereas to repeat previously assimilated skills one needs extrinsic motivation – some external incentive.

Here we see the importance of the inbuilt engine of growth for expanding organismic capacities. Through play and curiosity, both brain and intellectual development proceed. In fact, play is particularly prevalent during the most rapid periods of neurological development, promoting neural connections and differentiation. Accordingly, many educational theorists, from Montessori to Dewey to modern constructivists, have recognized the power of curiosity, interest, and playful activities in advancing educational aims. Yet contemporary test-focused approaches to educating seem largely to have forgotten this inner resource. We are indeed far from the original meanings associated with the word *school*, a concept that etymologically derived from the idea of *leisure* – a place for the employment of the playful, assimilating mind.

Intrinsic Motivation and SDT

We begin with a foundational point that is often forgotten by educational policy makers – namely, that humans are endowed by evolution with a strong propensity to learn. It is not a motivation that must necessarily be taught or prodded – indeed, it seems that curiosity and desire to learn are often fountains that, unfortunately, get turned off in school settings (Guay et al., 2008; Ryan & Brown, 2005).

The existence of intrinsic motivation is evident from birth. As Bronson (2000) noted, from early infancy, children show delight in controlling their own activity and producing effects on the environment. This fact was also frequently noted by Piaget (e.g., 1967; 1970) in discussing the unfolding of the child's cognitive capacities and understanding. Yet this robust interest in developing mastery and understanding of one's physical and social environments is significantly impacted by caregiver supports, a fact that has been a major focus of SDT. Specifically, adults' mirroring, interest, and responsiveness to children's initiative support this motivated activity, whereas anxious, controlling behaviors can diminish it (e.g., Grolnick, Kurowski, McMenemy, Rivkin, & Bridges, 1998; Landry et al., 2008). That is to say, right from the beginning, the tendency to explore and assimilate is either facilitated or thwarted by factors in the social context related to caregiver pressure, control, and anxieties.

Much of the early research within SDT focused on identifying those factors that enhance or derail intrinsic motivation. Deci and Ryan (1980), for example, argued that intrinsic motivation, although a natural tendency, is sustained by satisfaction of *psychological needs for autonomy and competence*. The need for autonomy refers to the experience of behavior as self-organized and volitional; it is disrupted when activity is impinged upon, or controlled externally, even through rewards. The need for competence refers to the experience of effectiveness or capability in action. It is undermined when feedback is negative or challenges are nonoptimal. Thus by either enhancing or diminishing satisfaction of these basic needs, social contexts either support or thwart the active developmental processes underpinned by intrinsic motivation, including many that Piaget examined. To date, hundreds of experimental studies have supported the SDT postulate that both autonomy and competence are necessary for the maintenance of intrinsic motivation (e.g., see Deci, Koestner, & Ryan, 1999; Ryan & Deci, 2000a).

Given the sensitivity of intrinsic motivation to social contextual influences it is no wonder that schools variously succeed in tapping into this rich inner resource. The SDT approach to intrinsic motivation has been studied in multiple school contexts, across varied countries and cultures. For example, Deci, Schwartz, Sheinman, and Ryan (1981) assessed U.S. elementary teachers' self-reports of their orientations toward supporting students' autonomy versus controlling their behavior. Subsequently, children assigned to more autonomy-supportive teachers, relative to those assigned to controlling teachers, reported increased intrinsic motivation, perceived competence, and self-esteem over time. Ryan and Grolnick (1986) obtained similar findings using students' self-reported and projective assessments of

teacher autonomy support and control. Students experiencing more autonomy-supportive teachers reported both more intrinsic motivation to learn and greater feelings of competence. In research with over 4,000 Canadian students, Vallerand, Fortier, and Guay (1997) showed that persistence (versus dropout) in schools was associated with greater intrinsic motivation and the overall relative autonomy of motives.

Since such early work, research on classroom climate and motivation has continued and is extensive. Recently, for example, Jang, Reeve, Ryan, and Kim (2009) examined the intrinsic motivation of South Korean high school students and found that perceived classroom autonomy support predicted greater autonomy and competence need satisfactions, which in turn predicted intrinsic motivation and positive engagement. Standage, Duda, and Ntoumanis (2003) showed that in British physical education classes, perceived autonomy support was associated with greater self-determination, including intrinsic motivation, within classrooms, which in turn was associated with greater intentions for leisure time physical activity.

Finally, we turn to multi-level modeling strategies. Tsai, Kunter, Ludtke, Trautwein, and Ryan (2008) examined variations in interest for classroom lessons across three subject areas on multiple days in a sample of German seventh graders. They found that, even controlling for individual differences in subject interest, variations in teacher autonomy support versus control predicted students' proximal interest experienced in the classroom on any given day. Mouratidis, Vansteenkiste, Lens, and Sideridis (2011) reported similar findings in their research within Belgian classrooms. Such within-person variation in interest as a function of ambient autonomy support bespeaks the dynamic nature of interest and active learning in school contexts.

Self-Determination Theory and Learning

Sparkling intrinsic motivation and interest through autonomy support also enhances learning outcomes. Grolnick and Ryan (1987) showed that autonomy-supportive versus controlling evaluative conditions fostered more interest and more conceptual learning for text material in elementary schoolchildren. Kage and Namiki (1990) similarly found that in Japanese school contexts, evaluative pressures undermined, and support for autonomy facilitated, not only intrinsic motivation toward classroom materials but also performance. Benware and Deci (1984) exposed college students to a neuroscience lesson, allowing them to expect that they would either teach it to another student (active condition) or be tested on it (passive condition). Results revealed that students who learned in order to use the material

actively were more intrinsically motivated than those who learned in order to take a test, and they showed better conceptual learning. Koestner, Ryan, Bernieri, and Holt (1984) performed an in-school experiment examining the effect of setting limits on behaviors. Limit setting is important to educational contexts, as limits facilitate students' effective functioning within the structures of the classroom environments. Yet teachers can set limits in different ways. Koestner et al. found that students who were given limits in controlling ways showed significantly less intrinsic motivation than those given limits in a more autonomy-supportive manner. Important too was the finding that the work of those children given autonomy-supportive limits was rated as significantly more creative than that of children given limits in a controlling way.

A number of conclusions can be drawn from these findings, and from those in the larger literature from which they are drawn, concerning intrinsic motivation and classroom contexts. First, both teachers' orientations and specific aspects of learning tasks that are perceived as autonomy supportive are conducive to students' intrinsic motivation, whereas controlling educational climates undermine intrinsic motivation. Second, students tend to learn better and are more creative when intrinsically motivated, particularly on tasks requiring conceptual understanding. Tasks that involve active engagement as opposed to passive intake are more likely to be intrinsically motivated, and this promotes deeper processing and more reciprocal assimilation as active engagement entails more coordination and organization than compartmentalized, externally directed learning. Third, how teachers introduce and communicate learning tasks affects students' psychological needs for autonomy and competence, thus either enhancing or thwarting their intrinsic motivation and the high-quality engagement and deep learning that can stem from it.

EXTRINSIC MOTIVATION, INTERNALIZATION, AND LEARNING

Intrinsic motivation provides an important natural basis for learning that can be harnessed by educators to enhance development. Nonetheless, many of the daily tasks and goals that educators ask students to do are not inherently satisfying or fun activities. Elementary school students may not find learning multiplication tables fun; high school teens may not want to memorize the periodic elements table. In such cases, students often need other reasons such as incentives to learn. *Extrinsic motivation* refers to behaviors performed to obtain some outcome separable from the activity itself (Ryan & Deci, 2000a). SDT holds, however, that extrinsic motivation is not a

unitary phenomenon. Instead, according to SDT there are several subtypes of extrinsic motivation that vary along a continuum of relative autonomy, and are therefore more or less volitional. These different types of extrinsic motivation are also associated with different classroom practices.

Four different types of extrinsic motivation have been specified within SDT, and these differ in terms of the degree to which they represent controlled versus autonomous functioning. The most controlled is *external regulation*, which refers to behaviors that are undertaken in order to obtain a reward or avoid a punishment. External regulators can often produce immediate compliance, but such behaviors are poorly maintained once the controlling contingencies (e.g., grades, threats, etc.) are removed. For example, a student might do a science project to avoid sanctions, but that student would likely not seek out additional information on the topic once the project is complete and graded. The second type of extrinsic motivation, which is also relatively controlled, is *introjected regulation*. Behaviors regulated by introjects are enacted to satisfy internal contingencies, such as gaining self-aggrandizement or avoiding self-derogation. For example, a student may study for exams to feel like a worthy son or daughter, or to avoid feeling a loss of self-esteem for poor performance. Indeed, an important and widely studied subtype of introjected motivation is *ego-involvement* (Ryan, 1982; Niemiec, Ryan, & Brown, 2008) in which one's self-esteem is contingent on performance. Introjection can be viewed as a partial internalization, in which the regulation has been "taken in" by the person but not really accepted as his or her own. Both external regulation and introjected regulation are phenomenologically characterized by an *external perceived locus of causality* (de Charms, 1968) – that is, these forms of behavioral regulation are not experienced as emanating from one's true sense of self. Accordingly, SDT views both external and introjected regulations as relatively impoverished methods of inspiring learning motivation, and it predicts that these lead to shallower learning, less reciprocal assimilation, and less transfer, among other indicators of learning quality.

Proceeding toward greater autonomy, behaviors that are enacted because they are considered personally valuable or important are said to exemplify *identified regulation*. For example, a teenaged girl might study some difficult topics because mastery of such information is important for her future career goals or can help her accomplish some valued task. Finally, even more autonomous is *integrated regulation*, whereby identified regulations have been synthesized with other aspects of the self, and thus are experienced as harmonious. For example, a young woman might study law because doing so enables her to enter a profession in which she can help

those in need, which is consistent with her abiding values and interests. Both identified regulation and integrated regulation are characterized by an *internal perceived locus of causality* (de Charms, 1968) – that is, these forms of behavioral regulation are experienced as reflecting one's true self and thus as volitional and autonomous.

A large number of empirical studies have examined the psychological and academic outcomes associated with more internalized or autonomous regulation for learning, of which we shall review only a few examples. Grolnick, Ryan, and Deci (1991) found that elementary students reporting more autonomous regulation for learning (i.e., identified and intrinsic motivation, rather than introjected and externally regulated) were rated by teachers as better adjusted in the classroom and as more academically achieving. Miserandino (1996) found that more autonomous learners had better classroom attitudes and affects and more enhanced learning outcomes across subject matters compared to less autonomous learners, even when prior achievement levels were controlled. Ratelle, Guay, Larose, and Senecal (2004) studied developmental trajectories of students' motivation in the transition to college. They found for many an increase in intrinsic motivation, but for others a loss of identification. They also reported that more positive motivational trajectories during change were associated with students who experienced parents as more autonomy supportive and involved. Black and Deci (2000) found that college students who reported higher autonomous self-regulation for learning organic chemistry reported higher perceived competence and interest/enjoyment for the course material, as well as lower anxiety. Moreover, this autonomous motivation predicted better performance even after controlling for prior grades and achievement test scores. Williams and Deci (1996) found that medical students who reported higher autonomous self-regulation for a course on medical interviewing were subsequently rated as more autonomy-supportive when interviewing standardized patients. Such evidence suggests that internalization of extrinsic motivation is critical to effective academic functioning at all levels of education. Through internalization, students can autonomously self-regulate those behaviors that are not inherently satisfying, which is important for continued engagement in important academic activities.

FACILITATING ENVIRONMENTS

Given that intrinsic motivation and more autonomous forms of extrinsic motivation are associated with enhanced learning and adjustment in

schools, SDT has focused considerable attention on how schools can enhance autonomous motivations. As with intrinsic motivation, SDT maintains that supporting students' basic needs for autonomy and competence is likely to lead them to internalize motivations to learn and to stay in school (Hardre & Reeve, 2003).

Autonomy-supportive teachers first and foremost consider their students' frame of reference in designing and motivating learning tasks. They minimize the sense of coercion, evaluative pressure, and control, and they maximize a sense of choice and volitional engagement. One important part of promoting autonomy is providing a meaningful rationale for why a task is important or useful. For example, Reeve, Jang, Hardre, and Omura (2002) found that autonomy-supportive rationales led students to more fully internalize regulations and to put more effort into the learning. More generally, Chirkov and Ryan (2001) showed that in both Russian and U.S. classrooms, students' perceptions of teacher and parental autonomy support were associated with greater internalization of academic motivation.

To support feelings of competence, educators introduce tasks that students can succeed at but that are not too easy, and they provide students with tools and feedback to help their feelings of efficacy emerge. Within SDT this concerns both positive feedback for effective efforts and *structure* that allows an active learner to know how to progress (Farkas & Grolnick, 2010; Grolnick & Ryan, 1989; Jang, Reeve, & Deci, 2010). Structure concerns the scaffolding that clarifies tasks, strategies, goals, and feedback and enhances the learners' feelings of efficacy as they engage in new tasks.

Finally, SDT posits that internalization depends on a sense of relatedness (Baumeister & Leary, 1995; Ryan & Powelson, 1991). People only adopt and internalize values and practices coming from others either to whom they feel attached or to whom they would like to be connected. That is, individuals internalize ambient practices and beliefs not only because they are in their environment but also as a way of connecting and feeling belongingness within that environment. Students' feelings of relatedness in classrooms is associated with the perception that the teachers like, value, and respect them. A student who reports such perceptions is more likely to exhibit identification and integration with respect to achievement-related tasks (e.g., Bao & Lam, 2008; Jang et al., 2009).

Numerous studies support the critical role of all three of these need-related supports for student motivation (Reeve, 2006; Reeve & Halusic, 2009). Classroom contexts where students experience autonomy, competence, and relatedness tend not only to foster more intrinsic motivation but also more willing engagement in less interesting academic activities.

Along with this increased learner autonomy come better quality learning outcomes, enhanced wellness, and a greater value for sustained learning.

AUTONOMY AND LEARNING ACROSS CULTURES

The strong experimental and field evidence concerning the relations of autonomy-support and control to basic processes of learning, interest-taking, and valuing has strong implications for educational practice. Yet even though the evidence is clear, and derived from studies of learners from around the globe, there remains resistance to the view that autonomy-support is universally beneficial. For example, authors such as Markus and Kitayama (1991) and Heinrich, Heine, and Zorenzayan (2010) suggest that autonomy has little significance outside the West.

→ This kind of cultural relativism, however, provides an excellent contrast with organismic thinking. Without denying that cultures impact the style and content of behavioral regulations, an organismic view understands that our active, assimilative human nature involves autonomy and self-organization, and that this is a natural rather than acquired human tendency. Suppression of autonomy will therefore detract from volitional motivation and vitality everywhere. Accordingly, much new research supports the SDT view of the functional importance of autonomy within schools across cultural contexts, only a small portion of which we have cited (see also Guay et al., 2008; Helwig & McNiel, 2012; Reeve & Assor, 2012). Whereas some deny that autonomy is meaningful to Asian individuals, research shows, to the contrary, that choice was associated with increased intrinsic motivation and performance in Chinese children (Bao & Lam, 2008); that autonomy mattered to school engagement in Korean high school pupils (e.g., Jang et al., 2009); and that functional magnetic resonance imaging data from Japanese students demonstrated the expected undermining effect of rewards on intrinsic motivation (Murayama, Matsumoto, Izuma, & Matsumoto, 2010). These and dozens of additional studies, using diverse methods and examining multiple outcomes, suggest strongly that there are no national or cultural boundaries on the most fundamental aspects of human growth and development.

TEACHERS' AUTONOMY AND CLASSROOM PRACTICE

Teaching practices do not occur in a vacuum. According to SDT, one major reason teachers use controlling rather than autonomy-supportive strategies in classrooms is because of the external pressures placed on them (Niemic

& Ryan, 2009; Ryan & Brown, 2005). This basic idea has been supported in a growing number of studies. For example, Roth, Assor, Kanat-Maymon, and Kaplan (2007) found that among Israeli teachers, those who felt more controlled in their own professional activities were less autonomy supportive toward students. Pelletier, Séguin-Lévesque, and Legault (2002) found that to the extent that Canadian teachers (grades 1 through 12) perceived pressure from above (e.g., toward test performances or curriculum coverage), the less autonomous they felt in teaching. Moreover, they were less autonomy supportive and more controlling in teaching and interacting with students, showing the negative cascading effect of controlling policies. This suggests that as teachers' own needs for autonomy are undermined, they will bring less enthusiasm and vitality to their teaching. Furthermore, the pressure placed on teachers to achieve specified outcomes leads them to use teaching strategies that tend to be more controlling and that crowd out effective and inspiring teaching practices that might otherwise be in place.

Policy makers are increasingly relying on controlling methods in an attempt to motivate teachers, with the hope that these in turn will pressure students to learn. Yet employing controlling contingencies to produce "accountability" ironically leads all partners in the learning process to suffer in regard to motivation, performance, and wellness (Ryan & Weinstein, 2009).

SDT research has shown that linking performance outcomes to rewards or sanctions is likely to be experienced as controlling. Predictably, it leads to narrow, goal-directed behaviors as well as reduced personal interest and investment in teachers and students alike (Deci & Ryan, 2002). In fact, empirical evidence suggests that such a linkage probably undermines complex learning as well as students' interest. This is because, typically, facts that have been predetermined as important are transmitted passively, supplanting significant learning through discovery. This kind of teaching lacks "ownership" or an internal perceived locus of causality among students and teachers alike, which is what sparks integrative interest and reciprocal assimilations. This lack of empowerment and latitude is also reflected in lower teacher morale and educational innovation (Ryan & Brown, 2005). In addition, because high-stakes assessments are uniform, or "one size fits all," usually they will not be optimally challenging for most individuals or school populations; they are not likely to support mastery and competence experiences, and can readily have an amotivating impact, undermining all motivation.

Policy makers who champion high-stakes testing techniques claim that these sanction-and-reward contingencies that are being attached to test

scores simply represent the use of reinforcements, in accord with behaviorist theories (see, e.g., Finn, 1991). Yet, classical behaviorist methods of reinforcement do not target outcomes; they target the behaviors themselves. For example, Skinner (1953) advocated applying reinforcement contingencies to *specific targeted behaviors*. Policies involving rewards and sanctions for test scores, in contrast, apply contingent consequences to *cognitive outcomes* rather than behaviors. Ryan and Brown (2005) suggested that a danger with this outcome focus is that all kinds of behaviors, both desirable (e.g., clearer lesson plans) and undesirable (e.g., teaching to the test, narrowing of curriculum) can be equally “reinforced” insofar as they are expected to produce desired outcomes. Even worse, practices such as outright cheating can be “reinforced” and supplant the improved instructional practices that policy makers may have intended to foster.

Moreover, policy makers focused on rewards for performance outcomes seem to implicitly assume an absence of inner motivation among teachers, a deficit they believe they are rectifying with rewards and punishments. That is, they are assuming the problem has been lack of incentives for teachers, rather than, for example, concentrations of poverty or inadequate numbers of adults in the classroom. We would dispute that assumption and, moreover, point out that these policies fail to consider the incompatibility of their motivational approaches and the motivation known to underlie quality learning.

Learning is a cultural resource that itself requires cultivation. It is more than facts – it is also about a way of engaging information that involves interest and value, and the coordinating, synthesizing, and integrating processes associated with these. There are identifiable methods by which these inner tendencies to be interested in or to value a domain of inquiry are best nurtured and fostered. But what is being applied instead is a factory model, not of nurturance, but of force-feeding. What is taken in is, in turn, predictably poorly digested.

CONCLUDING COMMENTS

Self-determination theory is a contemporary, empirically based approach to motivation and development. Its focus is on social contexts as facilitators of and barriers to the intrinsic motivational processes associated with intellectual and socioemotional growth and integration. There is an easily congruent interface between SDT and Piagetian theories, especially as applied to classroom practices. Classroom practices that support autonomy, competence, and relatedness are associated with both greater intrinsic motivation

and autonomous forms of extrinsic motivation. Facilitative practices for enhancing autonomy include providing choice and meaningful rationales for learning tasks, acknowledging students' feelings about the learning topics, and minimizing pressure and control. Strategies for enhancing competence include providing adequate and clear structure, effectance relevant feedback, and optimally engaging tasks. Facilitating relatedness entails the conveyance of warmth, respect, and a caring involvement.

Learning is assimilation, and attending not just to the structural transformations that occur but also to the contextual grounds in which active assimilation most readily occurs is critical to effective education. Piagetian theory demonstrates how innate functional tendencies toward growth, coherence, and integration of knowledge supply the mechanisms through which active engagement and true assimilation occur. This interest is in turn complemented by SDT and its focus on what facilitates or diminishes these developmentally critical human propensities.

Yet despite the common focus of these theories, contemporary educational policies around the world too often fail to recognize the importance of organismic principles for educational practice. Unlike many activities, learning is one that requires the active and willing participation of the learner (and teacher), which in turn means creating an atmosphere that supports that willing engagement. Not only does a psychological-need-supportive environment enhance learning outcomes, but it also facilitates holistic health development, and the overall well-being of the growing person. Nurturing such developmental flourishing should, after all, be the central goal of education.

REFERENCES

- Bao, X., & Lam, S. (2008). Who makes the choice? Rethinking the role of autonomy and relatedness in Chinese children's motivation. *Child Development, 79*, 269–283. doi: 10.1111/j.1467-8624.2007.01125.x
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497–529. doi: 10.1037/0033-2909.117.3.497
- Benware, C. A., & Deci, E. L. (1984). Quality of learning with an active versus passive motivational set. *American Educational Research Journal, 21*, 755–765. doi: 10.2307/1162999
- Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education, 84*, 740–756. doi: 10.1002/1098-237X(200011)84:6<740::AID-SCE4>3.0.CO;2-3
- Bronson, M. B. (2000). *Self-regulation in early childhood: Nature and nurture*. New York, NY: Guilford Press.

- Chirkov, V. I., & Ryan, R. M. (2001). Parent and teacher autonomy-support in Russian and U.S. adolescents: Common effects on well-being and academic motivation. *Journal of Cross Cultural Psychology, 32*, 618–635. doi: 10.1177/0022022101032005006
- de Charms, R. (1968). *Personal causation*. New York, NY: Academic Press.
- 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. doi: 10.1037/0033-2909.125.6.627
- Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 39–80). New York, NY: Academic Press.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum Press.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268. doi: 10.1207/S15327965PLI1104_01
- Deci, E. L., & Ryan, R. M. (2002). The paradox of achievement: The harder you push, the worse it gets. In J. Aronson (Ed.), *Improving academic achievement: Contributions of social psychology* (pp. 59–85). New York, NY: Academic Press. doi: 10.1016/B978-012064455-1/50007-5
- Deci, E. L., Schwartz, A. J., Sheinman, L., & Ryan, R. M. (1981). An instrument to assess adults' orientations toward control versus autonomy with children: Reflections on intrinsic motivation and perceived competence. *Journal of Educational Psychology, 73*, 642–650. doi: 10.1037/0022-0663.73.5.642
- Farkas, M. S., & Grolnick, W. S. (2010). Examining the components and concomitants of parental structure in the academic domain. *Motivation and Emotion, 34*, 266–279. doi: 10.1007/s11031-010-9176-7
- Finn, C. (1991). *We must take charge: Our schools and our future*. New York, NY: Free Press.
- Flavell, J. H., Miller, P. H., & Miller, S. A. (2002). *Cognitive development* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Grolnick, W. S., Kurowski, C. O., McMenemy, J. M., Rivkin, I., & Bridges, L. J. (1998). Mothers' strategies for regulating their toddlers' distress. *Infant Behavior and Development, 21*, 437–450. doi: 10.1016/S0163-6383(98)90018-2
- 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. doi: 10.1037/0022-3514.52.5.890
- Grolnick, W. S., & Ryan, R. M. (1989). Parent styles associated with children's self-regulation and competence in school. *Journal of Educational Psychology, 81*, 143–154. doi: 10.1037/0022-0663.81.2.143
- Grolnick, W. S., Ryan, R. M., & Deci, E. L. (1991). Inner resources for school achievement: Motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology, 83*, 508–517. doi: 10.1037/0022-0663.83.4.508
- Guay, F., Ratelle, C. F., & Chanal, J. (2008). Optimal learning in optimal contexts: The role of self-determination in education. *Canadian Psychology, 49*, 233–240. doi: 10.1037/a0012758

- Hardre, P. L., & Reeve, J. (2003). A motivational model of rural students' intentions to persist in, versus drop out of, high school. *Journal of Educational Psychology, 95*, 347–356. doi: 10.1037/0022-0663.95.2.347
- Heinrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*, 61–83. doi: 10.1017/S0140525X0999152X
- Helwig, C. C., & McNiel, J. (2012). The development of conceptions of personal autonomy, rights, and democracy and their relation to psychological well-being. In V. I. Chirkov, R. M. Ryan, & K. M. Sheldon (Eds.), *Human autonomy in cross-cultural context* (pp. 241–256). New York, NY: Springer.
- Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It's not autonomy support or structure, but autonomy support and structure. *Journal of Educational Psychology, 102*, 588–600. doi: 10.1037/a0019682
- Jang, H., Reeve, J., Ryan, R. M., & Kim, A. (2009). Can self-determination theory explain what underlies the productive, satisfying learning experiences of collectivistically oriented Korean students? *Journal of Educational Psychology, 101*, 644–661. doi: 10.1037/a0014241
- Kage, M., & Namiki, H. (1990). The effects of evaluation structure on children's intrinsic motivation and learning. *Japanese Journal of Educational Psychology, 38*, 36–45.
- 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. doi: 10.1111/j.1467-6494.1984.tb00879.x
- Landry, R., Whipple, N., Mageau, G. A., Joussemet, M., Gingras, I., Didio, L., & Koestner, R. (2008). Trust in organismic development, autonomy support, and adaptation among mothers and their children: A self-determination theory approach to parenting. *Motivation & Emotion, 32*, 173–188. doi: 10.1007/s11031-008-9092-2
- Markus, H., & Kitayama, S. (1991). Culture and self: Implications for cognition emotion and motivation. *Psychological Review, 98*, 224–253. doi: 10.1037/0033-295X.98.2.224
- Miserandino, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above average children. *Journal of Educational Psychology, 88*, 203–214. doi: 10.1037/0022-0663.88.2.203
- Mouratidis, A. A., Vansteenkiste, M., Lens, W., Sideridis, G. (2011). Vitality and interest-enjoyment as a function of class-to-class variation in need-supportive teaching and pupils' autonomous motivation. *Journal of Educational Psychology, 103*, 353–366. doi: 10.1037/a0022773
- Murayama, K., Matsumoto, M., Izuma, K., & Matsumoto, K. (2010). Neural basis of the undermining effect of monetary reward on intrinsic motivation. *Proceedings of the National Academy of Science, 107*, 20911–20916. doi: 10.1073/pnas.1013305107
- Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education, 7*, 133–144. doi: 10.1177/1477878509104318
- Niemiec, C. P., Ryan, R. M., & Brown, K. W. (2008). The role of awareness and autonomy in quieting the ego: A self-determination theory perspective.

- In H. A. Wayment & J. J. Bauer (Eds.), *Transcending self-interest: Psychological explorations of the quiet ego* (pp. 107–115). Washington, DC: APA Books. doi: 10.1037/11771-010
- Pelletier, L. G., Séguin-Lévesque, C., & Legault L. (2002). Pressure from above and pressure from below as determinants of teachers' motivation and teaching behavior. *Journal of Educational Psychology, 94*, 186–196. doi: 10.1037/0022-0663.94.1.186
- Pestalozzi, J. H. (1818). Address to my house, 1818. In J. A. Green & F. A. Collie (Eds.), *Pestalozzi's educational writings*. London: Edward Arnold, 1912.
- Piaget, J. (1967). *The child's conception of the world* (J. & A. Tomlinson, Trans.). London, UK: Routledge & Kegan Paul.
- Piaget, J. (1970). *Science of education and the psychology of the child* (D. Coltman, Trans.). New York, NY: Orion Press.
- Piaget, J. (1971). *Biology and knowledge* (B. Walsh, Trans.). Chicago, IL: University of Chicago Press.
- Piaget, J. (1981). *Intelligence and affectivity: Their relationship during child development* (T. A. Brown & C. E. Kaeg, Trans.). Palo Alto, CA: Annual Reviews.
- Ratelle, C. F., Guay, F., Larose, S., & Senecal, C. (2004). Family correlates of trajectories of academic motivation during a school transition: A semiparametric group-based approach. *Journal of Educational Psychology, 96*, 743–754.
- Reeve, J. (2006). Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *Elementary School Journal, 106*, 225–236. doi: 10.1086/501484
- Reeve, J., & Assor, A. (2012). Do social institutions necessarily suppress individuals' need for autonomy: The possibility of schools as autonomy-promoting contexts across the globe. In V. I. Chirkov, R. M. Ryan, & K. M. Sheldon (Eds.), *Human autonomy in cross-cultural context* (pp. 111–132). New York, NY: Springer.
- Reeve, J., & Halusic, M. (2009). How k–12 teachers can put self-determination theory principles into practice. *Theory and Research in Education, 7*, 145–154. doi: 10.1177/1477878509104319
- Reeve, J., Jang, H., Hardre, P., & Omura, M. (2002). Providing a rationale in an autonomy-supportive way as a strategy to motivate others during an uninteresting activity. *Motivation and Emotion, 26*, 183–207. doi: 10.1023/A:1021711629417
- Roth, G., Assor, A., Kanat-Maymon, Y., & Kaplan, H. (2007). Autonomous motivation for teaching: How self-determined teaching may lead to self-determined learning. *Journal of Educational Psychology, 99*, 761–774. doi: 10.1037/0022-0663.99.4.761
- Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology, 43*, 450–461. doi: 10.1037/0022-3514.43.3.450
- Ryan, R. M. (1993). Agency and organization: Intrinsic motivation, autonomy, and the self in psychological development. In J. Jacobs (Ed.), *Nebraska symposium on motivation: Developmental perspectives on motivation* (Vol. 40, pp. 1–56). Lincoln: University of Nebraska Press.
- Ryan, R. M., & Brown, K. W. (2005). Legislating competence: The motivational impact of high stakes testing as an educational reform. In A. E. Elliot & C. Dweck (Eds.), *Handbook of competence* (pp. 354–374). New York, NY: Guilford Press.

- Ryan, R. M. & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54–67. doi: 10.1006/ceps.1999.1020
- Ryan, R. M. & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78. doi: 10.1037/0003-066X.55.1.68
- Ryan, R. M. & Grolnick, W. S. (1986). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *Journal of Personality and Social Psychology, 50*, 550–558. doi: 10.1037/0022-3514.50.3.550
- Ryan, R. M. & Powelson, C. L. (1991). Autonomy and relatedness as fundamental to motivation in education. *Journal of Experimental Education, 60*, 49–66.
- Ryan, R. M. & Weinstein, N. (2009). Undermining quality teaching and learning: A self-determination theory perspective on high-stakes testing. *Theory and Research in Education, 7*, 224–233. doi: 10.1177/1477878509104327
- Silvia, P. J. (2008). Interest – the curious emotion. *Current Directions in Psychological Science, 17*, 57–60. doi: 10.1111/j.1467-8721.2008.00548.x
- Skinner, B. F. (1953). *Science and human behavior*. New York, NY: Macmillan.
- Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs and tenets from self-determination and goal perspective theories to predict leisure-time exercise intentions. *Journal of Educational Psychology, 95*, 97–110. doi: 10.1037/0022-0663.95.1.97
- Tsai, Y., Kunter, M., Lüdtke, O., Trautwein, U., & Ryan, R. M. (2008). What makes lessons interesting? The role of situational and individual factors in three school subjects. *Journal of Educational Psychology, 100*, 460–472. doi: 10.1037/0022-0663.100.2.460
- Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high-school drop out. *Journal of Personality and Social Psychology, 72*, 1161–1176. doi: 10.1037/0022-3514.72.5.1161
- Williams, G. C., & Deci, E. L. (1996). Internalization of biopsychosocial values by medical students: A test of self-determination theory. *Journal of Personality and Social Psychology, 70*, 767–779. doi: 10.1037/0022-3514.70.4.767