NEED SATISFACTION AND THE SELF-REGULATION OF LEARNING

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ABSTRACT: Self-regulation is analyzed in terms of self-determination theory using the concepts of intrinsic motivation and the internalization of extrinsic motivation. Laboratory experiments and field studies are reviewed indicating that: (1) intrinsic motivation and fully internalized extrinsic motivation are positively associated with high quality learning and personal adjustment; and (2) maintaining intrinsic motivation and internalizing extrinsic motivation are facilitated by social contexts that allow satisfaction of the basic psychological needs for autonomy, competence, and relatedness. Such contexts are ones that are characterized by the provision of choice, optimal challenge, informational feedback, interpersonal involvement, and acknowledgment of feelings.

Our analysis of self-regulation places individuals' experiences at its core. For an action to be considered fully self-regulated, people must experience a sense of volition—a sense of unpressured willingness to engage in the action. When behaviors are truly self-regulated, people do them with full and unconflicted endorsement.

Think of a tenth-grade girl who is genuinely eager to become a veterinarian. She spends the weekend before her biology exam quite willingly studying because it is personally important for her to learn the material and do well in the course. Her experience is one of wanting to study biology—of valuing the activity—so she is wholly engaged with the task.

In contrast, imagine her classmate who, on that same weekend, sits in front of her open biology text primarily because she feels pressure from her parents to do so. Unlike the first student, she is not volitional in her studying. She does not want to study so she is resentful and half-hearted in doing it. Her eyes skim the pages, but she takes in little of what is on them.

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Clearly, the former scenario exemplifies a high degree of self-regulation, with the student attending quite effectively to the task. And just as clearly, the latter scenario exemplifies a low degree of self-regulation, with the girl bringing no meaningful attention to the task in spite of the external pressure.

A more complex and interesting example involves yet another hypothetical classmate, a girl who studied very hard for her biology exam. An observer might well be delighted by the diligence and intensity of her behavior. Yet, when queried about why she studied for the exam, she said, "I felt like I had to, like there really was no choice." In fact, she went on to say, "I felt that I should to do it to prove myself, to be a model student, and to live up to my family's standards."

To what extent ought one say that this third student was truly self-regulated in her studying? She certainly worked hard, and no one had to coerce her to do it, at least not in any direct way. But she did her studying dutifully rather than volitionally. She did it without the feeling of ownership—without the sense of doing it for herself.

Within self-determination theory (Deci & Ryan 1985, 1991) self-regulation is conceptualized as a continuum. Individuals can thus be more or less self-regulated with respect to a particular behavior. The highest level of self-regulation involves actions that are freely undertaken because the person finds them interesting or important, and the lowest level involves doing an activity only because the person feels forced by some external agent. The aspiring veterinarian represents a relatively high level of self-regulation, while the biology student who spent her time daydreaming represents a relatively low level. The third biology student, who studied because she should live up to her family's standards, illustrates an intermediary level, between those represented by the first two biology students. Because she never fully endorsed the studying, she was not truly self-regulated, but she clearly displayed a greater degree of self-regulation than the student who did not really engage her biology text.

Differentiating types of regulation as we have done within self-determination theory is more than just a theoretical exercise. It is the starting point for addressing important empirical questions concerning the consequences and antecedents of the various types of regulation. As we will illustrate in the research review, numerous empirical investigations have shown convincingly that (1) different types of regulation are associated with different qualities of performance and different degrees of well-being; and (2) different interpersonal and developmental contexts lead people to use different types of regulation.

SELF-REGULATION: A MOTIVATIONAL ANALYSIS

Our motivational analysis of self-regulation has intention as a central concept (e.g., Heider 1958; Lewin 1951). To be motivated means to behave with the intention of achieving some outcome. However, the types of outcomes one pursues can

be very different, as can the reasons one pursues them. Numerous investigations have now indicated that a differentiated approach to motivation which considers different types of valued outcomes and different reasons for pursuing them provides better prediction of the quality of people's behavior and experience. Within self-determination theory, the differentiation of motivation begins with the distinction between intrinsic and extrinsic motivation.

Intrinsically motivated behaviors are performed out of interest and require no "separable" consequence, no external or intrapsychic prod, promise, or threat (Deci 1975). When intrinsically motivated, people are motivated simply to perform the activity—or perhaps, to perform it well—and to have the spontaneous experiences of interest, enjoyment, excitement, and satisfaction that accompany the behavior. Csikszentmihalyi (1975) used the term "autotelic" to describe such behaviors for which the purpose of the activity is, in a sense, the activity itself. Intrinsic motivation encompasses exploration, spontaneity, and interest in one's surroundings, and it is readily evident in curiosity, mastery strivings, and assimilation (Piaget 1971; White 1959). Intrinsically motivated behavior represents the prototype of self-determination. When intrinsically motivated, people feel wholly autonomous and volitional in behaving—they experience the behavior as an expression of themselves.

In contrast to intrinsic motivation, being *extrinsically motivated* involves performing an activity with the intention of attaining some separable consequence such as receiving a reward, avoiding guilt, or gaining approval. Behaviors that are extrinsically motivated would generally not occur spontaneously, so their occurrence must typically be prompted by some type of instrumentality.

Extrinsically motivated behaviors become self-determined through the closely related developmental processes of internalization and integration. *Internalization* involves people's transforming external regulatory processes into internal regulatory processes (Kelman 1961; Schafer 1968), and *integration* is the process through which these now internalized regulations are reciprocally assimilated with one's self (Ryan 1993). As an external regulation becomes internalized and integrated, the person becomes more fully self-regulating of that behavior. The behavior is still said to be extrinsically motivated because it is still instrumental to some separable consequence, but when the regulation has been integrated, the person will perform the instrumental behavior wholly volitionally.

INTERNALIZATION AND INTEGRATION

Self-determination theory, like other organismic models (e.g., Piaget 1971; Werner 1948), assumes that people are active agents whose engagement with their world leads to an ever more elaborated and refined set of internal processes and structures. We refer to this inherent tendency as *organismic integration* and we assume it to be a fundamental aspect of human life. It is the process through which healthy psychological development occurs.

One important manifestation of organismic integration is people's natural tendency to internalize values and behavioral regulations that are extant in their social world and to make those values their own. Being innately active, individu-

als accommodate to the world by internalizing and integrating the values and regulations that allow them to operate more effectively (Ryan, 1993). It is through this process that extrinsically motivated behaviors that were initially externally prompted can become increasingly internalized, resulting in greater self-regulation. However, if the process is hindered, the resulting partial internalization will lead to an intermediary level of self-regulation, much like that of the biology student who studied hard because she thought she had to to prove herself and live up to her family's standards.

We view internalization as an instance of organismic integration, so when internalization has functioned fully it is equivalent to integration. However, when internalization is only partial, it is does not represent integration. Self-determination theory specifies four types of extrinsic motivation that result from the process of internalization having functioned more versus less fully with respect to the regulation of a behavior. The more fully a regulation has been internalized, the more it represents integration and thus provides the basis for volitional behaving. In our theory the four types of extrinsic regulation are ordered along a continuum from being relatively controlled to relatively self-determined. They are outlined in Table 1 and discussed below.

External regulation describes behaviors that are controlled by contingencies overtly external to the individual. Examples of such regulation would be engaging in a behavior to obtain a reward or avoid a punishment. Although externally regulated behaviors are intentional, they are dependent on external contingencies and are thus said to be controlled by those contingencies. The biology student who absorbed little as she sat in front of her textbook because her parents made her was externally regulated.

Introjected regulation refers to behaviors that are motivated by internal prods and pressures such as threats of guilt or self-esteem-relevant contingencies. This type of regulation, which results from only partial internalization, is present when one behaves because one thinks one *should* or because one would feel ashamed if one did not. When a regulation has been introjected, it is internal to the person in the sense that it no longer requires overtly external prompts, but it has not become part of the person's sense of self. As such, introjected regulation is a form of internal motivation that is relatively *controlled* and for which the perceived locus of

TABLE 1
Forms of Extrinsically Motivated Behavior

Type of Regulation	*Degree of Self-Regulation*	*Description*
External	Very Low	Behavior controlled by demands or contingencies external to the person.
Introjected	Moderately Low	Behavior controlled by demands or contingencies inside the person such as self-esteem contingencies.
Identified	Moderately High	Behavior chosen because the person identifies with the importance of the activity.
Integrated	Very High	Behavior experienced as "wholly free" because the regulation has been integrated with the person's sense of self.

causality is external (deCharms 1968; Ryan & Connell 1989). The regulation is within the person but external to the self (Deci & Ryan 1991). The girl who studied biology because "she felt like she had to" was regulated by introjects, so her behavior would be classified as controlled.

From our perspective, ego-involvement (Nicholls, 1984; Ryan 1982; Sherif & Cantril 1947), which we define as being pressured to perform by contingent feelings of worth, results from the introjection of strict standards and the controlling technique of contingent love. Research by Ryan (1982) showing that ego-involvement undermines intrinsic motivation is one type of evidence that introjected or ego-involved regulation represents a controlling rather than autonomous form of regulation.

Identified regulation results when a behavior or regulation is adopted by the self as personally important or valuable. Here, people do not behave simply because they feel they should, but rather because they have identified with the value of the behavior and see its importance for their self-selected goals. The girl who willingly studied for her biology exam because doing well on the exam was important for her becoming a veterinarian had identified with the regulation of that activity.

Integrated regulation results from the integration or reciprocal assimilation of identified values and regulations into one's coherent sense of self. When an identification has become fully integrated, one will behave with a true sense of volition and willingness. Although the example did not provide enough detail to make this clear, if the aspiring veterinarian who identified with learning biology had fully integrated that identification with other aspects of her self, she would have displayed integrated regulation of her studying. Regulation resulting from integration is the most mature and self-determined form of extrinsic regulation.

Integrated extrinsic regulation bears considerable similarity to intrinsic motivation. They share the quality that defines autonomy, namely, a total involvement of the self. As such, these two types of regulation are the basis for true self-regulation. Nonetheless, the two types of motivation are different in that intrinsically motivated behavior is performed spontaneously because the person is interested in the behavior itself, whereas integrated behavior is performed freely because it is instrumental for an outcome that the person finds meaningful and important. If the biology student in the first scenario had studied because she found the material *interesting,* she would have been intrinsically motivated. Instead, she studied willingly because it was *important* for her becoming a veterinarian, so it was a relatively self-determined form of extrinsic motivation.

SELF-REGULATION: ITS CONSEQUENCES AND CORRELATES

Numerous studies have related the motivational processes outlined in self-determination theory to educationally relevant outcomes—that is, to the quality of learning, performance, and adjustment. This work has been guided by the general

hypothesis that autonomous self-regulation (i.e., intrinsic motivation and identified or integrated regulation) would be associated with more positive outcomes than would controlled (i.e., external and introjected) regulation.

Ryan, Connell, and Plant (1990) asked students to read a passage and rate how interesting and enjoyable they found the material. Subsequently, the students were tested on the material although they had not been informed about the test until after they had read the material and completed their ratings. Results revealed a strong positive correlation between subjects' interest/enjoyment and their subsequent recall of the material. This suggests that intrinsic motivation for learning, as reflected in interest and enjoyment, is an important contributor to the learning process. Research by Schiefele (1991) has similarly found interest to be positively correlated with depth of text processing and quality of learning.

Ryan and Connell (1989) developed an Academic Self-Regulation Questionnaire (ASRQ) to assess the strength of each of three types of extrinsic regulation: external, introjected, and identified. The questionnaire asks students why they do various school-related behaviors, such as their homework assignments. It then provides possible reasons (which had been a priori classified as external, introjected, or identified), and students rate the degree to which each reason is true for them. *External* reasons include behaving because of rewards, punishments, or demands imposed by a teacher or parent. An example would be, "I do my homework because I'll get in trouble if I don't." *Introjected* reasons involve doing a behavior to feel like a worthy person. An example would be, "I try to do well in school because I would feel bad about myself if I did not." *Identified* reasons involve doing school work because one has come to value leaning and education. A sample item would be, "I do my classwork because it's important to me to understand the subject."

The ASRQ does not include the integrated style because the scale was designed for middle childhood and the integrated style is a more developmentally advanced form of self-regulation than would typically be displayed by these children. The ASRQ does, however, assess intrinsic motivation because children do vary in the extent to which they are intrinsically motivated to engage in school activities. An example of an *intrinsic* reason is, "I do my homework because it is interesting and fun."

Data confirmed that the four subscales of the ASRQ formed a simplex-like pattern (higher correlations between scales that theoretically are more closely related), indicating that the forms of regulation can be ordered along an underlying dimension of autonomy. Although intrinsic motivation is innate and thus does not result from internalization, the fact that it correlates more strongly with identified regulation than with introjected regulation suggests that the more fully a student identifies with a regulation, the more closely the quality of regulation approximates that of intrinsic motivation.

Grolnick and Ryan (1987) used the ASRQ in a study of text learning and found that students who reported high intrinsic motivation and identified regulation displayed a higher level of conceptual learning, reflected in the open-ended essays they wrote about the passage they had read. In another study, Grolnick, Ryan, and Deci (1991) reported a positive relation between children's autonomous self-regu-

lation (i.e., intrinsic and identified reasons assessed with the ASRQ) and both objective measures of achievement and teacher reports of the children's competence.

Several studies have expanded upon the findings that autonomous self-regulation is related to positive educational outcomes. For example, Vallerand and Bissonnette (1992) used a variant of the ASRQ in a prospective study of junior college students. The researchers assessed students' motivation at the beginning of a school year, and at the end of the first semester they formed two groups of students, those who had stayed in school and those who had dropped out. The researchers then compared the motivation scores from the beginning of the year for the two groups and found that the students who had stayed in school had had higher scores on intrinsic motivation and on identified and integrated regulation than had those who dropped out.

Ryan and Connell (1989) found that both introjected regulation (i.e., more controlling motivation) and identified regulation (i.e., more autonomous motivation) were correlated with children's self-reports of trying hard in school and with parents' reports of their children being motivated; however, introjection was positively correlated with anxiety in school and maladaptive coping with failures, whereas identification was positively correlated with interest and enjoyment of school and proactive coping with failures. In other words, this like other studies (e.g., Grolnick & Ryan 1989) suggests that being more autonomous is associated not only with better performance in school but also with enhanced well-being. The Ryan and Connell finding is particularly poignant because it suggests that students who are relatively controlled may look as motivated as students who are more autonomous, but they may be paying a psychological cost for that contolled motivation.

Research by Williams and Deci (1996) explored the self-regulated learning of medical students in a course on interviewing that conveyed a psychosocial orientation toward patient care. This orientation emphasizes that health is a function not only of biotechnical (i.e., biological and pharmacological) factors but also of psychological and social factors and that physicians should be attuned to these factors to provide high-quality patient care. In their study, Williams and Deci used a variant of the ASRQ and found that students who became more autonomous in their learning about psychosocially oriented medicine over the five-month period of the course felt more competent in their interviewing and became stronger in their endorsement of psychosocial values—a change that was still evident in a two-year follow-up. Further, both autonomous self-regulation and psychosocial values at the end of the course were positively related to ratings of the students' behavior being more "patient-centered" five months later when they interviewed a simulated patient concerning coronary risk-factors. This study indicates that being more autonomous in one's learning is associated with adopting the educationally relevant values that are extant in the learning environment and then behaving in ways that are consistent with those values.

To summarize, a variety of studies have indicated that when students display more autonomous self-regulation, they evidence greater conceptual understand-

ing as well as better adjustment and coping, and they are more likely to internalize the values that are endorsed within the learning context.

HUMAN NEEDS AND SOCIAL CONTEXTS

According to self-determination theory, intrinsic activity and organismic integration function in the service of three innate psychological needs—the needs for *autonomy* or self-determination (deCharms 1968), *competence* or effectance (White 1959), and *relatedness* or affiliation (Harlow 1958). People are theorized to be inherently desirous of feeling connected to others within their social milieu, of functioning effectively in that milieu, and of feeling a sense of volition and personal initiative while doing so. These three needs underlie a variety of selected, directed, and persistent behaviors that result in intrapersonal and interpersonal integrity and coherence.

We define a psychological need in terms of the nutriments that are necessary for effective, healthy functioning (Ryan 1995; Ryan, Sheldon, Kasser, & Deci 1996). Thus, a desire or goal reflects a need only if, when satisfied, it promotes effective functioning and well-being and, when not satisfied, it diminishes effectiveness and health. Given this definition, one can see that many of the things people want are not *needs*. For example, research by Kasser and Ryan (1993, 1996) showed that the vigorous pursuit of and feelings of efficacy with respect to achieving wealth and fame are actually associated with ill-being rather than well-being, thus suggesting that these are not human needs even though they are extrinsic motivators of behavior. On the other hand, a study by Sheldon, Ryan, and Reis (in press) showed that well-being was predicted by the extent to which subjects satisfied their needs for autonomy and competence on a day-to-day basis.

One of the important functions served by delineating human needs is that it allows for the prediction of which variables in the social context will have positive versus negative effects on self-regulation. In other words, it is a basis for predicting which social contextual factors will promote versus forestall students' involvement in learning and effective adjustment to the complex social world. Interpersonal contexts that provide opportunities to satisfy the psychological needs for autonomy, competence, and relatedness will promote self-regulation and those that thwart satisfaction of the needs will impair self-regulation.

Our hypothesis that contextual supports for autonomy, competence, and relatedness enhance intrinsic motivation and promote integrated regulation is offered both as a social psychological process and a developmental process. In other words, we suggest that contextual supports facilitate self-regulation in the immediate situation where they are provided and also that they catalyze the development of self-regulation which tends to persist over time as an individual difference. Considerable research has supported this hypothesis at both levels of analysis. We turn to a review of that work.

SUPPORTS FOR AUTONOMY

Numerous laboratory and field studies have confirmed that factors which enhance the experience of autonomy facilitate intrinsic motivation and promote internalization, whereas those that leave people feeling controlled diminish both intrinsic motivation and internalization.

The initial studies of social-contextual influences were laboratory experiments examining the effects on intrinsic motivation of specific external events such as rewards, threats, and choice. With subjects ranging from college students (Deci 1971, 1972) to nursery school students (Lepper, Greene, & Nisbett 1973), the studies revealed that offering people extrinsic rewards such as money or good-player certificates for performing an intrinsically interesting activity tended to decrease their intrinsic motivation for the activity. After people had been rewarded for performing an interesting task, they were less likely to return to it in a free-choice period and they expressed less interest in the activity than individuals who had performed the activity for no rewards. Additional studies showed that threats of punishment (Deci & Cascio 1972), performance evaluations (Smith 1974), deadlines (Amabile, DeJong, & Lepper 1976), imposed goals (Mossholder 1980), and competition (Deci, Betley, Kahle, Abrams & Porac 1981) also undermined intrinsic motivation.

In contrast, other studies showed that providing choice (Zuckerman, Porac, Lathin, Smith, & Deci 1978) and acknowledging people's feelings (Koestner, Ryan, Bernieri, & Holt 1984) enhanced intrinsic motivation, presumably because they were experienced as autonomy supportive.

In interpreting such findings, Deci (1975) suggested that extrinsic inducements for performing an intrinsically motivated behavior tend to be experienced as controlling (i.e., as pressure to perform in a specific way), and thus tend to diminish people's experience of autonomy and undermine their intrinsic motivation. Simply stated, the pressure created by the inducements thwarts satisfaction of people's need for autonomy, or, in the words of deCharms (1968), it induces a shift in the perceived locus of causality from internal to external, leaving them feeling like pawns to the extrinsic controls. However, the offer of choice and the acknowledgment of feelings represent encouragements for individual autonomy, and thus facilitate a shift in the perceived locus of causality from external to internal.

These various studies have suggested that some specific contextual events such as the offer of a reward or the imposition of a deadline tend to undermine people's intrinsic motivation by thwarting their need for autonomy, whereas other events such as the provision of choice or the acknowledgment of feelings tend to enhance their intrinsic motivation by supporting their need for autonomy. However, subsequent research has indicated that the style and language with which the events are administered also influence their impact. For example, Ryan, Mims, and Koestner (1983) found that performance-contingent rewards, when administered controllingly (with language like "you should" or "you have to"), undermined intrinsic motivation, but when the rewards were administered with a more autonomy-supportive style (e.g., without pressuring language), they were less likely to be undermining. Similar results were found for setting limits on children's behavior (Koestner et al. 1984). When limits were set controllingly, they diminished

children's intrinsic motivation for the target task, but when they were set without using pressuring language and in a way that provided choice and acknowledged feelings, they were not detrimental to intrinsic motivation. And still further support was provided by a study of competition in which the undermining of intrinsic motivation by competition occurred when the interpersonal context was pressuring, but not when it was supportive (Reeve & Deci 1996).

To summarize, numerous laboratory experiments confirm that intrinsic motivation can be influenced both by specific contextual events and by the interpersonal style with which these events are administered. The theoretical element that reconciles all the findings is the concept of individuals' experiencing *autonomy support* versus *control*. Any input that is experienced as support for autonomy enhances intrinsic motivation, whereas any that is experienced as a controller of behavior thwarts satisfaction of the need for autonomy and decreases intrinsic motivation.

Although intrinsic motivation promotes learning and adjustment, it does so only with respect to activities that children find interesting. There are, however, many things that adults consider important for children to learn and do, but that the children might not find interesting. Thus, adults must initially prompt such activities extrinsically while at the same time promoting the internalization and integration of these extrinsic regulations.

A laboratory experiment by Deci, Eghrari, Patrick, and Leone (1994) indicates that autonomy support versus control also affects internalization and integration. These investigators explored the effects of minimizing control and acknowledging people's feelings on the internalization of a regulation for an uninteresting activity. Participants did the boring task of searching a computer screen for random dots of light and pressing a key whenever they saw one. Results indicate that the autonomy-supporting factors of emphasizing choice while minimizing the use of pressuring language and of acknowledging people's feelings about the boring task led to more internalization, thus suggesting that autonomy support not only enhances intrinsic motivation but also promotes internalization of extrinsic structures.

The Deci et al. (1994) experiment further showed that internalization which occurred in the autonomy-supporting conditions tended to be integrated, as reflected by positive correlations between behavioral self-regulation and self-reports of perceived choice, personal importance of the activity, and enjoyment, whereas internalization that occurred in the more controlling conditions tended to be introjected, as reflected by negative correlations between behavioral self-regulation and the same three affective self-report variables. It thus seems that providing contexts that allow satisfaction of the need for autonomy not only increases the likelihood of internalization, but also helps to ensure that the internalization will be integrated.

Finally, a set of laboratory experiments has investigated the direct effects of autonomy support versus control on educational outcomes. For example, Grolnick and Ryan (1987) performed an experiment in which fifth-grade students read age-appropriate text material in one of three conditions: (1) a directed, controlling learning conditions in which the children were told they would be tested and graded; (2) a directed, noncontrolling condition in which they were told they would be asked questions about the text but that it would not be a test and they

would not be graded; and (3) a nondirected, spontaneous-learning condition in which they were told they would be asked questions about how interesting and difficult the passage was. The first was viewed as a condition that allowed little autonomy; the second, although directed, allowed greater autonomy; and the third was considered an autonomy-supportive, intrinsic-motivation condition. Subsequently, all children were tested and results indicated that the two autonomy-supportive conditions (i.e., the noncontrolling-directed and the nondirected) led to more interest in the material and better conceptual understanding than the controlling condition. This implies that there was greater depth of processing, resulting in better comprehension and mastery of the material when the context was autonomy supportive. Results also indicated that the two directed learning conditions yielded greater rote memorization than the nondirected condition, but the controlled group also evidenced greater deterioration of memorized material over the subsequent week, leaving them no better off than the nondirected group even in terms of rote learning.

An experiment by Benware and Deci (1984) involved college students' reading a detailed article on neuropsychology under one of two learning sets. One condition pressured students to learn by telling them they would have a graded exam, whereas the other encouraged students' active involvement by offering them the opportunity to teach the material to others. A subsequent exam administered to all participants revealed that when students were pressured by the anticipation of a test, they memorized facts as well as the students in the noncontrolling condition, but they did not gain as full an understanding of the concepts that tie together those facts as did the other students. These results thus complement those of Grolnick and Ryan in suggesting that minimizing controls enhances conceptual learning.

Field Research. Other investigations of social contexts have been performed in educational settings and have contrasted the effects of autonomy supportive versus controlling classroom climates on intrinsic motivation and internalization. Deci, Schwartz, Sheinman, and Ryan (1981) used a measure to assess the degree to which teachers tend to motivate learning in an autonomy-supportive versus a controlling manner, and they found that children in classrooms with more autonomy-supportive teachers, where the teachers tended to consider the students' frame of reference and offer choice, displayed greater curiosity, more independent mastery attempts, and higher self-esteem than students in classrooms with more controlling teachers. Ryan and Grolnick (1986) found that when students perceived their classroom as more autonomy-supportive, assessed with deCharms' (1976) origin-climate measure, the students were more intrinsically motivated to learn and they perceived themselves as more academically competent.

Research by Kage (1991) in Japanese junior high schools provided further support for the positive relations between autonomy support and intrinsic motivation. The researcher arranged to teach history in different classrooms using different methods. Some classes got a controlling approach with emphasis on tests and grades, while others got a more autonomy-supportive approach with emphasis on informative feedback and self-direction. Those who were taught with the more controlling approach expressed less interest in the material, rated them-

selves as less competent, and reported greater anxiety than those who were taught with the more autonomy-supportive approach. Furthermore, the students in the controlling classrooms actually performed significantly worse on a summary exam at the end of the course segment than did the students in the more autonomy-supportive classrooms.

Studies by Williams and colleagues conducted in medical schools have also confirmed the importance of autonomy-supportive learning climates. One study (Williams & Deci 1996) revealed that when the learning climate was autonomy supportive, students became more self-regulating in their learning over the period of the course, which as we mentioned earlier was related to their feeling more competent and internalizing the values espoused in that setting. In two other studies (Williams, Saizow, Ross, & Williams 1995; Williams, Wiener, Markakis, Reeve, & Deci 1994), it was found that medical students were more likely to select careers in internal medicine if they experienced the learning climate of their internal-medicine clerkship as more autonomy supportive. The same phenomenon was observed with respect to selection of a career in surgery. Together the various studies suggest that autonomy-supportive learning contexts, in which teachers take the students' perspective, encourage self-initiation, provide choice, and minimize the use of controlling language and controlling events, lead to enhanced conceptual learning, more interest, greater internalization of extant values, and greater well-being.

Parenting. The finding that autonomy support plays an important role in increasing students' intrinsic motivation and internalization, and in turn their learning and adjustment, is not limited to the influence of teachers. Grolnick and Ryan (1989) used in-home, structured interviews with parents to examine the impact of parental autonomy support versus control on children's capacity to be autonomously self-regulating of their school work. An autonomy-supportive parenting style was evidenced by a willingness to offer choice and to consider the child's perspective when making decisions. In contrast, a controlling parental style was characterized by the use of extrinsic contingencies such as rewards, punishments, and pressures to motivate the child. Children of these parents completed the self-regulation questionnaire (ASRQ) and various other self-report measures in their classrooms. Regression analyses revealed that parental autonomy support was positively related to children's intrinsic motivation and internalization of regulations for school-related activities. Further, parental autonomy support was also positively related to children's being rated by their teachers as being more capable and better adjusted, and to the children's school achievement.

SUPPORTS FOR COMPETENCE

Other studies have focused on contextual elements that tend to enhance versus undermine intrinsic motivation by promoting versus thwarting people's experience of competence. To be intrinsically motivating a target activity must provide an optimal challenge by being optimally discrepant from one's skill level (Deci 1975; Csikszentmihalyi 1975). If it is too easy it tends to be boring, and if it is too

difficult it tends to be overly anxiety provoking. A study by Danner and Lonky (1981) confirmed that in an experimental classroom, children tended to select activities that were just slightly beyond their current competencies, as determined by a pre-test. These optimally challenging activities attracted the children and seemed to provide them the opportunity to experience a sense of competence by conquering the challenges (Deci, 1975).

Other studies have shown that positive feedback tends to strengthen perceived competence and enhance intrinsic motivation. For example, a laboratory experiment by Deci (1971) indicated that when college students were told they were doing well at a puzzle-solving activity, they evidenced greater subsequent engagement with the activity than did students who had not received feedback. Subsequent research has shown, however, that these effects depend on the feedback's being administered in an autonomy supportive way. For example, experimental results indicate that only if the positive feedback results from self-determined action (Fisher 1978) or is presented with a noncontrolling style (Ryan 1982; Usui 1991) does it enhance intrinsic motivation. Positive feedback that used controlling locution (e.g., "Good, you did just as you should.") tended to undermine intrinsic motivation (Ryan 1982). We refer to positive feedback that is administered in an autonomy-supportive manner as being *informational* (Deci 1975; Ryan 1982).

Several theorists have proposed that the ability to control outcomes and the feeling that one is competent in interacting with the environment are important motivating factors, and some consider these the critical factors for promoting intrinsic interest, self-regulation, behavior change, and learning (e.g., Bandura 1977). The research by Ryan (1982) and others has shown however that although personal control over outcomes is important, it is not sufficient for autonomous regulation; the associated feelings of competence must be accompanied by the feelings of autonomy in order for individuals to be self-regulated.

In contrast to positive feedback, negative feedback, particularly if it is critical and evaluative or administered in a controlling manner, tends to diminish perceived competence and decrease intrinsic motivation. Several experiments have shown, for example, that negative feedback leads to less intrinsic motivation than no feedback (Deci & Cascio 1972) or than positive feedback (Vallerand & Reid 1984). Presumably, if negative feedback is administered in a noncritical, autonomy-supportive way, it could represent a challenge and promote motivation, but that has not been well studied. Thus, although negative feedback may not always undermine intrinsic motivation, studies suggest that it does tend to have a detrimental motivational effect.

In sum, research has indicated that opportunities to satisfy one's need for competence do contribute to individuals' self-regulation, although thus far our research has focused more on the effects of competence supports on intrinsic motivation than on their effects on internalization and integration.

RELATIONAL SUPPORTS

Harlow (1958) has argued that individuals need to experience love and interpersonal contact to develop optimally, thus implying that there is an innate

psychological need for *relatedness*. In fact, considerable research on attachment (Ainsworth, Blehar, Waters, & Wall 1978) has demonstrated that infants and young children must experience a sense of interpersonal security or psychological closeness in their primary relationships in order to display exploratory activity (i.e., intrinsic motivation) and well-being. It is in this sense that intrinsic motivation flourishes only when there is a backdrop of relatedness to others. This, of course, is not true just in infancy; the exploratory spirit in all humans is most robust when persons are operating from a "secure base" (Bowlby 1979) or a sense of relatedness (Ryan, Deci, & Grolnick 1995).

Much of the research on relatedness has focused on parents rather than teachers, although the work that has been done with teachers also confirms the importance of their relational supports—that is, their interest in and responsiveness to the children with respect to activities such as school work for which self-regulation is important.

Studies by Grolnick and Ryan (1989) and Grolnick and Slowiaczek (1994) found that both mother and father involvement (i.e., attending to and being concerned about the children's school work) did predict children's internalization of behaviors relevant to doing well in school. Grolnick, Ryan, and Deci (1991) also found that children's perceptions of their parents' being available and spending time with them around school-related activities facilitated autonomous self-regulation and learning.

In another study, Avery and Ryan (1988) related children's reports of parental involvement (as well as of autonomy support) to their projectively assessed representations of their parents. Results indicated that both involvement and autonomy support were significantly related to more nurturant object representations, which in turn were associated with better classroom adjustment among a group of largely urban, minority, children.

Finally, Ryan, Stiller, and Lynch (1994) did a study in which approximately 600 middle-school children completed the Inventory of Adolescent Attachment (Greenberg 1982) which assessed felt security and emotional utilization with respect to parents and teachers. Results indicated that students who felt secure with their parents and teachers and who felt able to turn to them when they were having problems tended to cope more positively with academic failures, to be more autonomous in regulating their school behaviors and more engaged with learning, and to feel better about themselves. The quality of relatedness to parents and teachers of junior high-school students thus seems to facilitate internalization of regulations for school-related activities, and to be related to various indices of school adjustment and well-being.

GOAL THEORIES

Several recent accounts of motivation in education have used goals as a central concept (e.g., Ames & Ames 1981; Dweck 1986). Goals are essentially a cognitive

representation of something a person wants to achieve, and the theories describe a dichotomy between different types of goals. For example, Dweck distinguished between learning goals, in which the aim is to increase one's competence, and performance goals, in which the aim is gain a favorable (or avoid an unfavorable) judgment about one's competence. Certainly there is something that is shared between the intrinsic-extrinsic motivation dichotomy and the learning-performance goal dichotomy, and there is evidence that performance goals can have negative consequences relative to learning goals, just as extrinsic controls have negative consequences relative to intrinsic interest.

In our view, goals are the target of one's actions whereas motives are the reasons that one has those targets, and we believe that it is useful to move beyond the goals to the motivation that underlies them in order to make more refined predictions about achievement and adjustment, to better understand people's experience, and to prescribe the nutriments necessary to enhance performance and well-being.

Without knowing why one holds a performance goal, it is difficult to make differentiated predictions or to interpret complex findings. For example, Elliot and Harackiewicz (1996) found that performance goals sometimes undermine intrinsic motivation and sometimes do not. This suggests to us that performance goals are sometimes pursued relatively autonomously, but at other times are experienced as quite controlling. And according to our theory, this could occur either because some individuals have more fully internalized and integrated the performance goals whereas other individuals have remained controlled by them; or alternatively that the interpersonal contexts within which some individuals worked toward their performance goals were relatively autonomy supportive whereas the contexts within which others worked toward the goals were relatively controlling.

CONCLUSIONS

Self-determination theory proposes that individuals have an intrinsic tendency to explore, understand, and assimilate aspects of their environment. This tendency is the basis of curiosity, mastery attempts, and a variety of other intrinsically motivated behaviors that result in growth and development. It also underlies the natural willingness to internalize and integrate values and extrinsic regulatory processes that are present in the social world. Self-regulation is evident when individuals are either intrinsically motivated or have fully internalized and integrated extrinsic motivation. Internalization that is only partial, taking the form of introjection, does not represent true self-regulation. Considerable research was reviewed indicating that self-regulation is associated with the acquisition of cognitive skills and the development of self—that is, with high quality learning and psychological well-being.

Social contexts that support an individual's strivings to satisfy the three innate psychological needs—that is, contexts in which significant others support satisfac-

tion of the needs for autonomy, competence, and relatedness—allow individuals to maintain intrinsic motivation and facilitate integration of extrinsic motivation. Such social contexts, in turn, promote greater engagement, deeper and fuller learning, and enhanced personal adjustment in classrooms and beyond.

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