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SELF-REGULATED AND SELF-DIRECTED LEARNING: WHY DON'T SOME NEIGHBORS COMMUNICATE?

Laurent Cosnefroy and Philippe Carré

In the Western world today, there is overwhelming agreement among researchers, managers and policy-makers alike about the need for a more autonomous workforce in order to face the daunting challenges of work in an emerging cognitive society (Commission Européenne, 1995; OCDE, 2000; Cedefop, 2003). The growing demands of technological advance in an age of exploding information and globalized business challenges highlight the increasingly rampant need for continuous, day-to-day maintenance and upgrading of one's knowledge, skills, and attitudes. As a consequence, salaried employees are and will be more and more systematically encouraged (and often requested) to manage a significant share of their lifelong professional learning and development *by themselves*, whether in situations that are formally organized for training and educational purposes or not (Carré, 2005).

Parallel to the promising visions of lifelong learning and the autonomous knowledge worker that have emerged in most Western countries over the last 50 years, the literature in the relevant fields of adult education, vocational training and educational psychology has evidenced a striking intensification of interest in self-learning concepts. More than 20 years ago, Carré (1992) conducted an initial search which produced no less than 15 notions used in the adult education literature in relation to autonomous learning: *autonomous learning, independent learning, self-directed learning, self-managed learning, self-organized learning, self-regulated learning, self-determined learning, self-planned learning, self-initiated learning,*

self-learning, self-education, self-instruction, self-teaching, autodidaxy, and autodidactic learning. Among these, a preliminary count in the major educational databases (Carré & Cosnefroy, 2011) identifies two leaders: *self-directed learning* (hereafter SDL) and *self-regulated learning* (hereafter SRL). We will begin by defining each of them while attempting to point out their conceptual similarities and differences. Then, we will document the links (or absence thereof) between these two constructs in the relevant bodies of literature. Finally, we will offer three possible explanations in order to try to account for this mutual ignorance among close scientific kin.

SDL and SRL as Close Neighbors

Definitions and Scope Analysis

For the layperson, there is little doubt that, semantically speaking, SDL and SRL are close neighbors and could be considered as synonymous. Even scholars in educational psychology have suggested that the terms *self-directed learning* and *self-regulated learning* have often been used interchangeably in the literature (Loyens, Magda, & Rikers, 2008). Indeed, “[a]t first sight, SDL and SRL seem highly similar” (Jossberger, Brand-Gruwel, Boshuizen, & van de Wiel, 2010, p. 417), and several recent articles use both notions indifferently, as if they were accepted synonyms (Abar & Loken, 2010; Francom, 2010). As we shall see, seminal definitions of both terms point to a large amount of notional overlap.

A widely accepted conceptual foundation of SDL is Knowles’ (1975) definition:

In its broadest meaning, self-directed learning describes a process in which individuals take the initiative, with or without the assistance of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (p. 18)

Twenty years later, Long (1991) concurred: “I define self-directed learning as a personally directed purposive mental process usually accompanied and supported by behavioral activities involved in the identification and searching out of information” (p. 15).

At about the same time, Zimmerman (1989) proposed:

In general, students can be described as self-regulated to the degree that they are metacognitively, motivationally, and behaviorally active participants in their own learning process. Such students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or other agents of instruction. To qualify specifically as *self-regulated* in my account, students’ learning must involve the use of specified strategies to achieve academic goals on the basis of self-efficacy perceptions. This definition assumes the importance of three elements: students’ self-regulated learning strategies, self-efficacy

perceptions of performance skill, and commitment to academic goals. (p. 329)

Zimmerman's model of SRL is probably among the most popular. Other models, such as those elaborated by Corno (2001), Boekaerts (1997), Winne (Winne & Hadwin, 1998), and Pintrich (2004), focus on a variety of different aspects of SRL (cf. Cosnefroy, 2011). Boekaerts' model emphasizes emotional aspects, Corno's the volitional aspect, and Winne's model underscores the cognitive aspects of SRL. Whichever the model, all assume that SRL implies directing one's learning by setting goals, monitoring the learning process, and using various cognitive and volitional strategies (Boekaerts & Corno, 2005; Pintrich, 2004).

These first definitions point to the similarity of the two concepts, both aimed at describing the various dimensions of independent, agentic management of one's learning efforts. Loyens et al. (2008, p. 417) note, "Overall, both SDL and SRL involve active engagement and goal-directed behavior." According to Pilling-Cormick and Garrison (2007), SDL and SRL both address issues of responsibility and control in learning.

A Three-Dimensional Contrast

Upon closer examination, however, these close conceptual neighbors appear noticeably different. Three of their properties account for the dissemblance: their dominant scientific field of reference, the category of learner population they are concerned with, and, most importantly, their scope of application in the learning process. A first, exploratory look at the sparse literature that relates to both constructs and to dominant patterns of research in each of the two fields reveals a strikingly contrasted situation which can be summed up in the following chart (Carré & Cosnefroy, 2011) (Table 1).

Table 1. *SDL and SRL: A Hypothetical Proposition of Differentiation*

	Self-Directed Learning	Self-Regulated Learning
Field of Reference	Adult education	Educational psychology
Dominant Population	Adult learners	Children, adolescents, students
Scope of Application	Learning projects	Learning activities

As noted in previous reviews (Loyens et al., 2008, p. 418) "The adult education roots of SDL give this concept a history in learning outside school environments. . . . SRL, on the other hand, has been studied within school learning." This first element accounts for two significant differentiating factors between both research traditions: SRL is mostly concerned with school-based learning, hence mostly studied by educational psychologists, while SDL, since its foundation, has been inspired by adults at grips with continuous formal or informal learning after their school years and hence has been mostly analyzed by adult education specialists. Lastly, and most significantly, SRL and SDL are supposed to

vary widely as to their scope within the larger field of research into learning. Loyens et al. (2008) state,

Clearly, both SDL and SRL carry an element of student control. However, the degree of control the learner has, specifically at the beginning of the learning process when the learning task is defined, differs in SDL and SRL. In SDL, the learning task is always defined by the learner. A self-directed learner should be able to define what needs to be learned. . . . In SRL, the learning task can be generated by the teacher. . . . In this sense, SDL can encompass SRL, but the opposite does not hold. (p. 418)

Conversely, this distinction also implies that SDL requires SRL: one needs self-regulation to become a capable self-directed learner. Zimmerman, for instance, studied the techniques used by skillful writers. He described self-regulation of writing as a kind of SRL that appears outside a formal educational setting and in which the learning task is defined by the learner (Zimmerman & Risemberg, 1997). Nevertheless, research on SRL has mainly focused on the *how* of the self-regulation: how do students get what they want? That is, how do students keep themselves on track toward their desired outcomes (Pintrich, 2003; Reeve, Ryan, Deci, & Jang, 2008)?

Due to its origins in educational psychology's studies of learning efforts of youth within the school system, SRL primarily investigates strategies, skills and attitudes favorable to an effective *learning activity* in constrained academic situations where the wider goals do not belong to the learners themselves. In contrast, investigations of SDL have been carried out by adult education specialists who, following the tradition of Tough's notion of *learning projects*, have been mostly concerned with out-of-school, independent learners as the prime decision-makers of self-determined educational endeavors. The difference lies in the ownership of the learning project, which rests, almost by definition, with the learner in SDL; while it could be controlled externally in SRL. In other words, while agency is at the core of both concepts, it applies to the larger distal goals in SDL but is restricted to proximal learning goals in SRL. The self-directed learner controls the learning trajectory as a whole, whereas the self-regulated learner's control is restricted to the learning activity. We agree with Loyens et al. (2008) in stating that SDL can (and should) imply SRL, but the reverse is not true.

On the theoretical front, we reached a similar conclusion in our attempt to articulate SDL and SRL concepts by referring to Deci & Ryan's (2002) concept of self-determination. We may thus characterize SDL as both self-regulated *and* self-determined, while SRL may concern both self-determined and externally controlled acts of learning.

Table 2 shows subcategory possibilities when crossing setting goals and achieving goals. Self-determination here means that the learners make their own decisions when choosing their options in education and training. In the case of external control, the goals are set by teachers and the learners identify a learning opportunity that may trigger a high level of self-regulated learning (controlled

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SRL) or a low level of self-regulated learning (other-directed learning), depending on the characteristics of the learning situation.

Table 2. *Self-learning Concepts (Carré, 2010)*

	Self-determination	External control
High level of self-regulation	Self-directed learning (self-determined + self-regulated)	Controlled self-regulated learning
Low level of self-regulation	Externally regulated, self-determined learning	Other-directed learning

Self-regulated learning is viewed as a continuum depending on the level of choices allowed to the student in terms of methodology, resources, or study time. As stated by Winne (1995), self-regulated learning is a cognitively inherent aspect of learning. Through the process of metacognitive monitoring the learner always makes decisions and controls his or her learning, albeit with a varying degree of engagement and success. Moreover, whatever the source of goals and the characteristics of the learning situation, goals often require protection and maintenance if they are to be met (Corno, 1993). In this sense, lack of self-regulated learning cannot really occur even though the learning situation is strongly defined by the teacher and curtails the learner's choices. This is the reason why we used low level of self-regulation instead of lack of self-regulation in Table 2.

Finally, the distinction between SDL and SRL nicely fits in the Rubicon model of action phases elaborated by Heckhausen (Heckhausen & Gollwitzer, 1986). This model capitalizes on Lewin's distinction between goal striving and goal setting (Lewin, Dembo, Festinger, & Sears, 1944). Goal striving is behavior directed toward existing goals, whereas goal setting addresses the issue of what goals a person will choose. Heckhausen has included these two problems into a single theoretical model that allows us to study the two steps in relation to each other and to introduce a temporal perspective by distinguishing four phases, from deliberation to evaluation of action. Goal striving is related to volition, goal setting to motivation. Being focused on the *how* of self-regulation, SRL theories enhance the volitional part of the learning process, whereas SDL theories focus on the deliberating phase of learning.

Meta-Documentary Research

Aims

Given this triple difference, one could expect SDL and SRL researchers to collaborate so as to conduct studies together that combine their complementary characteristics: learners (school population vs. adult learners), approaches (educational psychology vs. adult education) and scope (learning activities vs. learning projects). The purpose of this empirical part of our research was to evaluate the amount of collaboration between SDL and SRL researchers, based on the amount of published material that uses both concepts jointly. Our hypothesis

was that cross-references using both SRL and SDL concepts would be minimal in the relevant literature(s). We have put this hypothetical statement to the test of a systematic documentary investigation.

Method

This meta-documentary research was based on a full literature search using SDL and SRL as key words in two authoritative databases in education psychology and educational science: Education Research Complete® (hereafter ERC) and ERIC®. The frequency and nature of hundreds of publications using them have been analyzed over a period of 10 years (2000-2010) and the evolution of each series (self-regulated v. self-directed learning) compared to the other. Cross-uses and interfaces between the concepts (or the lack thereof) have also been studied. Quotation marks around SDL and SRL have been used in each query to find an exact match.

Findings

Evolution Of Each Research Field

We first scrutinized the evolution of studies referring to SDL or SRL from 2000 to 2010 (Table 3).

Table 3. *Evolution of Research on SDL and SRL from 2000 to 2010*

	SRL		SDL	
	ERIC	ERC	ERIC	ERC
2000	136	105	668	136
2010	546	636	1049	604
2010/2000	x 4.01	x 6.06	x 1.57	x 4.44

The last row displays the increase rate between 2000 and 2010. The results showed a large increase in both fields. However, a combined search using both SDL and SRL as keywords only provided nine entries between 2000 and 2010 for ERIC and five entries for ERC. In line with our hypothesis, the results support the view that SDL and SRL are two parallel research fields with little or no connection.

Specificities of Each Concept

We then used extra keywords combined with SDL and SLR in order to specify each concept. More specifically, it was hypothesized that target populations and theoretical framework are largely dissimilar in each field.

Target populations. Table 4 displays the results when adding *adults* (or *adult learning*, which leads to the same results) and *academic achievement*. The percentages refer to the number of studies linking adults or academic achievement

with SDL or SRL compared with the overall number referring to SDL or SRL indicated in Table 1.

Table 4. *Proportion of Studies Linking SDL and SRL to Adults and Academic Achievement*

SRL + Adults		SDL + Adults		SRL + Academic Achievement		SDL + Academic Achievement	
ERIC	ERC	ERIC	ERC	ERIC	ERC	ERIC	ERC
25	17	531	250	154	92	40	15
4.6%	2.7%	50.6%	41.4%	28.2%	14.4%	3.9%	2.5%

First, one should note that SDL is much more closely linked to adults than SRL. Conversely, SRL is more linked to academic achievement than SDL. It is worth pointing out that about half of the studies relying on SDL are matched with *adults*; whereas the relationships between SRL and academic achievement are considerably weaker.

Even though ERIC and ERC display different numbers of occurrences (especially for *SDL + Adults*), the ratios are quite close: ERIC displays 11 times more studies linking SDL and adults than studies linking SRL and adults. For ERC, this ratio increases to 15 times more. In addition, one should note that ERIC databases display 6.13 times more studies linking SRL and academic achievement than those linking SRL and adults. It also provides 12.97 times more studies linking SDL and adults than those linking SDL and academic achievement. The ERC database provides 5.33 times more studies linking SRL and academic achievement than those linking SRL and adults. It also displays 16.56 times more studies linking SDL and adults than those linking SDL and academic achievement.

Regardless of what databases are being used, it is clear from the results presented above that SDL is a concept used more frequently in the adult education domain. Its links with school and high school appear to be very scarce.

Theoretical framework. Research on SRL is rooted in cognitive psychology. As stated by Winne (1996), research on metacognition and cognitive strategy “has built a broad platform for newer and increasingly more active work in SRL” (p. 327). Capitalizing on metacognitive theory, the SRL paradigm calls for expanding the study of learner activity by combining the investigation of cognitive, metacognitive and motivational processes in order to achieve a better understanding of autonomous learning (Cosnefroy, 2011).

As a consequence, we can hypothesize that relationships between SRL and metacognition will be more important than those between SDL and metacognition. Likewise, we hypothesize that a similar picture will be found regarding the relationships that SRL and SDL share with *self-efficacy*, a key concept in motivational research. Table 5 displays the occurrences to be found when

combining SDL, SRL and *metacognition*. The percentages were computed by dividing these occurrences by the whole number of studies devoted to SDL and SRL in 2010 as indicated in Table 3 (second row). SDL is hardly ever linked with metacognition, as compared with SRL, for which the percent rises to 29.7% (ERIC database).

Table 5. *Studies Linking SRL and SDL to Metacognition in 2010*

SRL + Metacognition		SDL + Metacognition	
ERIC	ERC	ERIC	ERC
162	104	32	4
29.7%	16.4%	3%	0.7%

Again, significant differences can be observed when considering SDL and SRL's respective relationships with self-efficacy (Table 6).

Table 6. *Studies Linking SRL and SDL to Self-Efficacy in 2010*

SRL + Self-efficacy		SDL + Self-efficacy	
ERIC	ERC	ERIC	ERC
128	102	17	20
23.4%	16.0%	1.6%	3.3%

Although the range of the differences appears to be less marked in ERC than in ERIC, the results lead to the conclusion that self-efficacy has clearly been more often associated with SRL than with SDL.

SRL, SDL and Self-Determination

SRL and SDL theories both attempt to understand what it means to be an autonomous learner. Autonomy is also at the core of a leading motivational theory. Self-determination theory (hereafter SDT) makes a distinction between autonomous and controlled self-regulation. The former is a self-endorsed regulation, the sense that one's actions stem from oneself and are one's own, whereas the latter means that the person's behavior is regulated by coercive forces outside the self (Deci & Ryan, 2002). The scope of the SDT goes beyond learning to include all domains in which self-regulation plays an important role (e.g., work, health, leisure). However, SDT has also been used in the area of learning, more specifically to address the interpersonal conditions that support students' experience of autonomy (Reeve, 2009; Reeve et al., 2008). Since SRL, SDL and SDT share a common focus on autonomy, one could hypothesize that studies on SRL and SDL use concepts present in SDT. Therefore, we crossed SDL and SRL with the keyword *self-determination*. Surprisingly, this crossing of SRL and SDL with self-determination leads to as few occurrences for SRL as for SDL. In 2010, we only found seven studies linking SRL and SDT and fourteen studies linking SDL and SDT in the Eric databases (respectively 14 and 23 in the ERC databases).

Two Parallel Worlds?

As shown above, there has been a significant increase in research on SDL and SRL from 2000 to 2010. The studies refer to one or the other but hardly ever to both concepts together, as if the research belonged to two parallel worlds without any connection. Likewise, there is a patent lack of connections with SDT, another theory that also focuses on autonomous self-regulation. Secondly, a cross-index query using such keywords as *adults, academic achievement, metacognition, and self-efficacy* has shown that each concept uses a specific set of related concepts. SDL is more often associated with adult learning, while maintaining a lesser relationship with academic achievement, metacognition, and self-efficacy. SRL, on the other hand, is more often linked with academic achievement, metacognition, and self-efficacy, while its links with adult learning are marginal. These results support the assumption of two different theoretical frameworks being used in research on SRL and SDL. As SRL is situated midway between cognition and motivation, it is congruent that research on SRL should refer to both metacognition and self-efficacy. On the contrary, constructs issued from cognitive and motivational psychology seem to be seldom used in SDL research.

Conclusion: Three Combined Reasons Why Some Neighbors Don't Communicate

It is hypothesized that three reasons account for the fact that such close conceptual neighbors don't communicate – namely institutional differences, epistemological barriers, and scientific power issues. First, as shown in the present article, SRL and SDL, although true contemporaries in terms of their emergence in the educational literature, originated in different fields of practice, research groups, and professional milieus. SRL appeared in connection with research on academic achievement (hence in schools and, to a lesser extent, higher education), whereas the roots of SDL are to be found in studies of adult learning. This first distinction accounts for the fact that researchers, practitioners, readers and potential users of the corresponding theories have seldom found common ground or circumstances to exchange ideas, concepts and experience relative to their (unbeknownst to them) common interest in various forms of learner autonomy.

From a complementary epistemological point of view, we have also noted that SRL has mainly been studied within educational psychology, whereas SDL developed as a research topic within adult education. This second institutional divide, this time between university departments, reinforced mutual ignorance among faculty and students of both families. Respect for (or fear of) disciplinary frontiers may also have been reinforced by the classical phenomenon of paradigmatic closure, which Kuhn brought to light (Kuhn, 1962). For coherent members of a given scientific community, such as educational psychologists studying SRL or adult education scholars invested in SDL research, a certain proportion of mutual ignorance may be accounted for by the fact that new, unfamiliar paradigms of research bearing on objects similar to one's own produce

an unsettling amount of theoretical dissonance. Putting one's slowly accumulated knowledge about a given concept to the test of a foreign discipline's unfamiliar expertise may be a harder and harder move to make as one progresses in scholarly expertise and mentorship.

Almost as a consequence of the preceding remarks, one could consider the lack of interaction between SRL and SDL as a key instance of scientific competition between rival academic groups. Following such a radical sociology of science hypothesis, ignorance or oblivion of potential scientific partners protects agents against the risk of losing a share of power in the quest for symbolic capital that defines intellectual and scientific professions even more than in many other trades (Bourdieu, 1991).

SRL and SDL are close, specific, and complementary concepts situated within a rich network of common theoretical issues and practical challenges. Whether for institutional, epistemological or sociological reasons, scholars interested in either concept hardly interact at all at the conceptual, methodological or practical interfaces that link them. Our hope is that the present article will contribute to a significant increase in communication, mutual knowledge, and collaboration between such (so far) unrelated neighbors.

References

- Abar, B., & Loken, E. (2010). Self-regulated learning and self-directed study in a pre-college sample. *Learning and Individual Differences, 20*, 25-29.
- Boekaerts, M. (1997). Self-regulated learning: A new concept embraced by researchers, policy makers, educators, teachers and students. *Learning and Instruction, 7*, 161-186.
- Boekaerts, M., & Corno, L. (2005). Self-regulation in the classroom: A perspective on assessment and intervention. *Applied Psychology: An International Review, 54*, 199-231.
- Bourdieu, P. (1991). The peculiar history of scientific reason. *Sociological Forum, 6*, 3-26.
- Carré, P. (1992). *L'autoformation dans la formation professionnelle*. Paris, France: Documentation Française.
- Carré, P. (2005). *L'apprenance, vers un nouveau rapport au savoir*. Paris, France: Dunod.
- Carré, P. (2010). L'autodirection des apprentissages. In P. Carré., A. Moisan., & D. Poisson (Eds.), *L'autoformation. Perspectives de recherche* (pp. 117-169). Paris, France: Presses Universitaires France.
- Carré, P., & Cosnefroy, L. (2011, June). *Self-determined, self-regulated and self-directed learning: Unrelated kin?* Paper presented at the 6th Self Biennial International Conference. Laval, Quebec, Canada.
- Cedefop. (2003). *Lifelong learning: Citizens' views*. Luxembourg: Office des Publications Officielles des Communautés Européennes.

- Commission Européenne. (1995). *Enseigner et apprendre. Vers la société cognitive*. Luxembourg: Office des Publications Officielles des Communautés Européennes.
- Corno, L. (1993). The best-laid plans. Modern conceptions of volition and educational research. *Educational Researcher*, 22(2), 14-22.
- Corno, L. (2001). Volitional aspects of self-regulated learning. In B. Zimmerman & D. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives* (pp. 191-225). Mahwah, NJ: Lawrence Erlbaum.
- Cosnefroy, L. (2011). *L'apprentissage autorégulé, entre cognition et motivation*. Grenoble, France: Presses Universitaires de Grenoble.
- Deci, E., & Ryan, R. (2002). An overview of self-determination theory: An organismic-dialectical perspective. In E. Deci, & R. Ryan (Eds.), *Handbook of self-determination research* (pp. 3-33). Rochester, NY: The University of Rochester Press.
- Francom, G. (2010). Teach me how to learn: Principles for fostering students' self-directed learning skills. *International Journal of Self-Directed Learning*, 7, 29-44. Retrieved from <http://sdlglobal.com/journals.php>
- Heckhausen, H., & Gollwitzer, P. (1986). Information processing before and after the formation of an intent. In F. Klix & H. Hagendorf (Eds.), *Human memory and cognitive capabilities* (pp. 1071-1082). Amsterdam, Netherlands: Elsevier.
- Jossberger, H., Brand-Gruwel, S., Boshuizen, H., & van de Wiel, M. (2010). The challenge of self-directed and self-regulated learning in vocational education: A theoretical analysis and synthesis of requirements. *Journal of Vocational Education and Training*, 62, 415-440.
- Knowles, M. (1975). *Self-directed learning. A guide for learners and teachers*. Chicago, IL: Association Press /Follett.
- Kuhn, T. (1962). *The structure of scientific revolutions*. Chicago, IL: The University of Chicago Press.
- Lewin, K., Dembo, T., Festinger, L., & Sears, P. S. (1944). Level of aspiration. In J. M. Hunt (Ed.), *Personality and the behavior disorders* (pp. 313-178). New York, NY: Ronald Press.
- Long, H. B. (1991). Challenges in the study of self-directed learning. In H. B. Long & Associates, *Self-directed learning: Consensus and conflict* (pp. 11-28) Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.
- Lounsbury, J., Levy, J., Park, S. H., Gibson, L., & Smith, R. (2009). An investigation of the construct validity of the personality trait of self-directed learning. *Learning and Individual Differences*, 19, 411-418.
- Loyens, S. M., Magda, J., & Rikers, R. M. (2008). Self-directed learning in problem-based learning and its relationships with self-regulated learning. *Educational Psychology Review*, 20, 411-427. doi:10.1007/s10648-008-9082-7
- OCDE. (2000). *Société du savoir et gestion des connaissances*. Paris, France: OCDE.

- Pilling-Cormick, J., & Garrison, D. R. (2007). Self-directed and self-regulated learning: Conceptual links. *Canadian Journal of University Continuing Education, 33*(2), 13-33.
- Pintrich, P. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95*(4), 667-686.
- Pintrich, P. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review, 16* (4), 385-407.
- Reeve, J. M. (2009). Why teachers adopt a controlling motivating style towards students and how they can become more autonomy supportive. *Educational Psychologist, 44*(3), 159-175.
- Reeve, J. M., Ryan, R., Deci, E., & Jang, H. (2008). Understanding and promoting autonomous self-regulation: A self-determination theory perspective. In D. Schunk & B. Zimmerman (Eds.), *Motivation and self-regulated learning* (pp. 223-244). New York, NY: Lawrence Erlbaum.
- Winne, P. (1995). Inherent details in self-regulated learning. *Educational Psychologist, 30*(4), 173-187.
- Winne, P. (1996). A metacognitive view of individual differences in self-regulated learning. *Learning and Individual Differences, 8*, 327-353.
- Winne, P., & Hadwin, A. (1998). Studying as self-regulated learning. In D. Hacker, J. Dunlosky, & A. Graesser (Eds.), *Metacognition in educational theory and practice* (279-306). Mahwah, NJ: Lawrence Erlbaum.
- Zimmerman, B. (1989). A social-cognitive view of academic self-regulation. *Journal of Educational Psychology, 81* (3), 329-339.
- Zimmerman, B., & Lebeau, R. B. (2000). A commentary on self-directed learning. In D. H. Evensen & C. E. Hmelo (Eds.), *Problem-based learning: A research perspective on learning interactions* (pp. 299-313). Mahwah, NJ: Lawrence Erlbaum Associates.
- Zimmerman, B., & Risemberg, R. (1997). Becoming a self-regulated writer: A social cognitive perspective. *Contemporary Educational Psychology, 22*, 73-101.