Motivation from a Self-Regulated Learning Perspective: Application to School Psychology

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Abstract:

Self-regulation of learning involves developing metacognitive awareness (planning, monitoring, and evaluating) of (a) cognition—motivational beliefs, (b) behaviours—persistence, effort, engagement, and (c) affect—enjoyment, interest, and other emotions. Metacognitive awareness creates opportunities to exert metacognitive control as needed, which may involve sustaining or manipulating motivational cognition, behaviour, and affect. By adopting a self-regulation perspective, this paper discusses the ways motivation develops within and across academic tasks and situations, as well as the ways learners can be supported to take control of their motivation in those contexts. Applying self-regulation principles in the practice of School Psychology means to consider the role of situation, context, and learners' socio-historical experiences while empowering learners to focus attention on things they can control.

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Review of Theory

Self-regulating learners are adaptive and responsive in their approaches to new situations or challenges. They view errors as opportunities to learn, and challenges as opportunities to apply and adapt strategies. Self-regulation of learning (SRL) refers to the cyclical process of taking charge of one's learning by engaging in strategic planning, monitoring, and adapting of one's cognition, behaviour, motivation, and/or emotions (Boekaerts et al., 2000; Butler & Winne, 1995; Winne & Hadwin, 1998, 2008; Zimmerman, 1989, 2000). Self-regulated learners are described as (a) goal-directed in their approaches to academic tasks, (b) metacognitive, as they leverage inner thoughts and self-awareness to direct and adjust strategies during learning, (c) motivated, as they exercise agency to strive toward meaningful goals, and (d) strategic, as they devise, execute, and modify a set of actions to manage their learning (see review in Zimmerman & Schunk, 2008). Among many favourable characteristics, self-regulated learners are more likely to seek out resources and studying strategies (e.g., Zimmerman & Martinez-Pons, 1990) and perform better in academic tests (e.g., Ohtani & Hisasaka, 2018). SRL provides an important framework for understanding the mechanisms through which motivation arises and influences adaptive and maladaptive responses to learning situations and challenges, such as those regularly encountered by school psychologists.

Motivation is a complex psychological process whereby individuals' subjective beliefs and perceptions influence choices, effort, and persistence (Eccles & Wigfield, 2002; Stipek, 1996). Motivation is comprised of multiple attributes influenced by three global questions (a) *Can I do it?* (b) *Do I want to do it?* (c) *Is it worth doing?* (Anderman & Wolters, 2006; Eccles & Wigfield, 2002; Linnenbrink-Garcia & Patall, 2016; Murphy & Alexander, 2000). Constructs researched in the first category include efficacy beliefs and mindsets (Kapasi et al. in this issue). The second category addresses learners' goals and whether they are generated intrinsically or inspired extrinsically (Chavan et al. and Guay et al. in this issue). Finally, learners' judgment on whether a task is worth doing is influenced by their appraisals of the task values, the costs associated with pursuing the task, including their emotional wellbeing, and the expected likelihood of success or failure (Boekaerts & Niemivirta, 2000; Tze et al. in this issue). While these questions refer mainly to inner thoughts and beliefs, sources of motivation extend beyond that; they involve an interaction between the person (beliefs, knowledge, experiences), their behaviour (strategies and approaches taken), and environment ([context, environment, tasks]; Bandura, 1986). Importantly, neither motivational beliefs nor behaviours are fixed. Rather, these are malleable constructs influenced by experiences, situated in context, responsive to intervention, and under the control of learners.

Motivational theories share some common properties. A learner's volitional control (persistence, avoidance, engagement) is predicated on judgements they make about three global questions discussed above (Table 1; see also Bakhtiar, 2019). How students arrive at answers to those questions and outcomes associated with those answers are modelled by motivational theories. Most theories focus on a limited number of these questions (see discussions in Wigfield & Koenka, 2020), but together they lay a foundation for modelling and empirically testing

motivational influences and the ways instructional practices support or thwart motivation (Stipek, 1996).

Table 1

Contemporary Motivational Theories in Education and Beliefs They Mainly Emphasize

	Can I do it?	Do I want to do it?	Is it worth doing?
Achievement Goal Theory (Ames, 1992)		x	
Attribution Theory (Weiner, 1985)	x		x
Control-Value Theory (Pekrun et al., 2002)	x		x
Expectancy-Value Theory (Eccles & Wigfield, 2000)	x		x
Interest Theory (Hidi & Renninger, 2006)			x
Mindset Theory (Dweck, 2006)	x		
Self-concept Theory (Marsh, 2007)	x	x	
Self-Determination Theory (Deci & Ryan, 2000)		x	
Self-Efficacy Theory (Bandura, 1986)	x		

SRL theory is less concerned with modelling motivational attributes or answers to those questions. Instead, SRL theory is concerned with understanding (a) the role of motivation in strategic task engagement—*how motivational beliefs and experiences shape self-regulatory processes,* and (b) the role of strategy use in reshaping motivational beliefs and attributions—*how learners exercise control over those motivational beliefs and experiences to change their academic outcomes*. Fundamentally, to regulate motivation means to influence sources of motivation needed to either initiate, maintain, or boost engagement for achieving a particular task (Miele & Scholer, 2018; Wolters, 2003). By adopting an SRL perspective, this paper discusses the ways motivation develops within and across academic tasks and situations, as well as the ways learners can be supported to take control of their motivation in those contexts.

Modelling Motivation from A Self-Regulated Learning Framework

Motivation is central to all models and theories of SRL (Schunk & Zimmerman, 2008). Individuals' motivational beliefs and experiences leave cognitive traces and interpretations that shape their engagement in self-regulatory processes. We describe these SRL processes using Winne and Hadwin's (1998, 2008) four-phase model because, in addition to situating the role of motivation at a macro-level in influencing SRL phases, it also models motivation at a micro-level as evolving and developing cyclically within and across academic work and experiences.

Winne and Hadwin (1998) describe self-regulation as unfolding over four loosely sequenced and recursively linked feedback loops, engaged whenever an episode of academic work is confronted (Figure 1, top panel). In Phase 1 (Task Understanding), learners construct perceptions of the academic work and situational context. By appraising the value and characteristics of the task, learners also construct perceptions about their motivation and the level of motivation necessary for the task. In Phase 2 (Goal Setting), learners generate plans and goals based on what they understand about task features and demands, as well as themselves in relation to that task. These goals are multi-dimensional, informed by motivational beliefs (i.e., responses to *Can I do it? Do I want to do it? Is it worth doing?*), including thresholds about the level of motivation needed to sustain task engagement. Phase 3 (Strategic Enactment) is where the actual academic work takes flight. During this phase, learners draw on a wealth of strategies and approaches they know to engage in the work at hand. The sophistication of this phase is partly dependent upon the strategies known to the learner, and the flexibility with which those strategies are applied to the academic work. Finally, in Phase 4 (Adaptation), learners draw on metacognitive monitoring and evaluation to strategically adapt various aspects of their learning as needed. That adaptation can be near-reaching, such as updating understandings of the task requirements or refining a goal, but they can also be far-reaching informing current or future learning episodes. SRL phases are modelled as loosely sequenced, meaning that learners do not always engage in the phases in order. Often, learners may dive right into Phase 3 and apply a strategy to tackle an academic task, with limited task understanding of the academic work, purpose, or context. The phases are recursive, implying that learners update or revise products of each phase as prompted by external or internal metacognitive cues. For example, when a strategy fails a student may reassess priorities and goals.

The micro-level mechanism guiding transitions across all phases is the COPES (conditions, operations, products, evaluations, and standards) cognitive architecture that is catalyzed by metacognitive monitoring and evaluating (Winne, 1997). Per the COPES architecture (Figure 1, bottom panel), internal and external *conditions* provide context for engagement in each regulatory phase. Internal conditions comprise factors internal to the learner, such as motivational beliefs, domain knowledge, epistemic beliefs, emotions, and personal histories. Interacting with the internal conditions are factors external to the learner, such as other individuals (peers and teachers), tasks features, and available technological tools. When a learner wishes to exert control over their conditions, they activate cognitive *operations* to process and manipulate information, including information about their motivation (Winne & Marx, 1989). This model recognizes motivational beliefs and attributes as forms of cognitive information upon which learners exercise metacognitive monitoring and control (cf. metamotivation in Miele & Scholer, 2018).

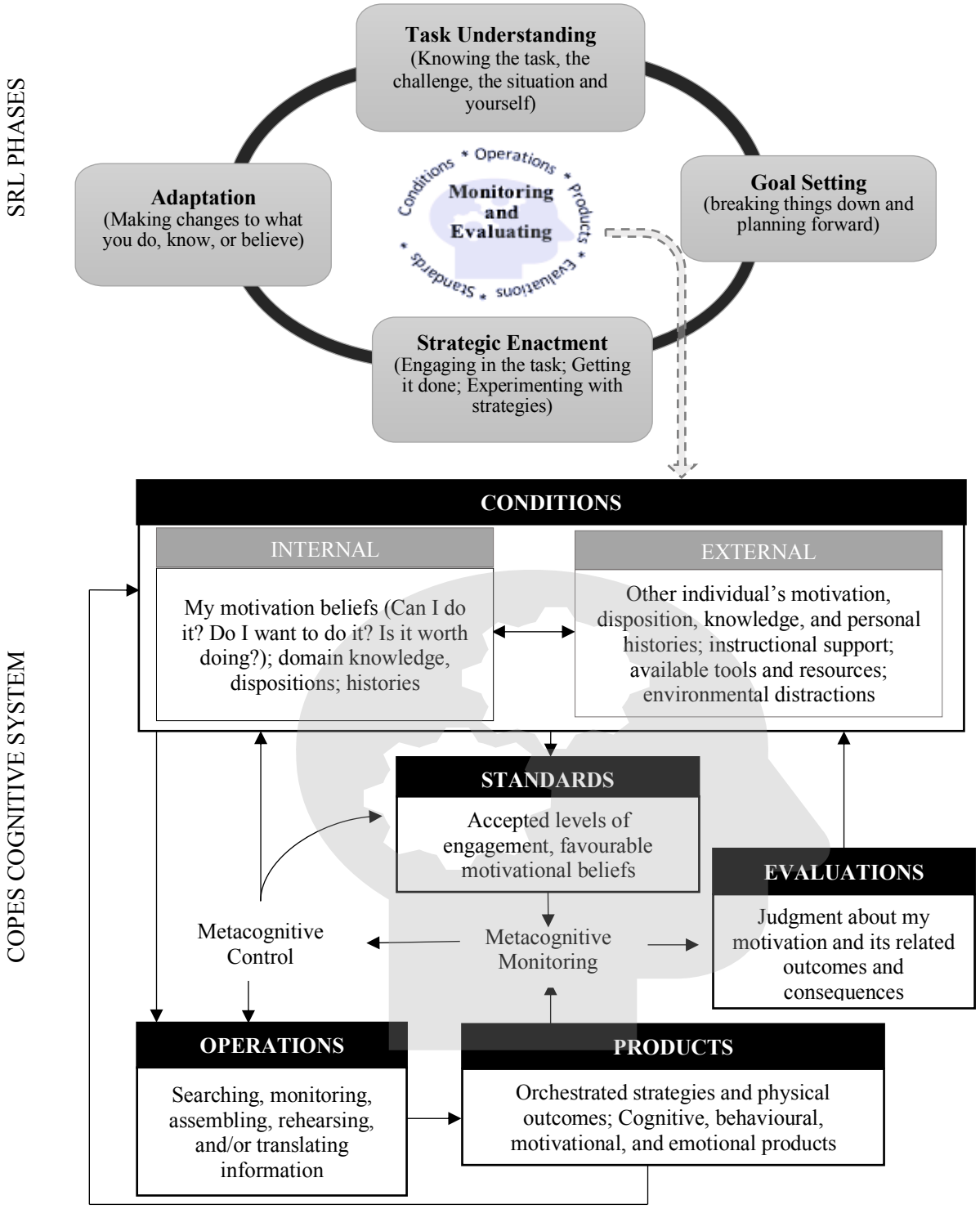
Operations learners perform may include one or more of the following: searching, monitoring, assembling, rehearsing, and translating (Winne, 1985). For instance, a learner

searches for information evidencing their competency related to a task. Operations create *products* that, in the case of motivation, manifest as motivational beliefs or attributions (e.g., beliefs you can do it), motivational actions (e.g., persistence or effort), or positive or negative affective responses (e.g., enjoyment). Learners then construct judgment or *evaluations* of those products by comparing them to specified or perceived *standards*. For example, standards regarding favourable levels of self-efficacy, effort, or utility versus cost for moving forward with any phases of SRL.

Overall, the COPES architecture recognizes motivation as relevant in all regulatory phases and, primarily, as having dual roles: (a) a *condition* that influences regulatory actions (e.g., a high level of motivation influencing choices for deeper study strategies), and (b) a *product* of regulatory actions (e.g., being more motivated after setting a clear goal). Motivational conditions and products emerge from positive and negative past academic experiences and can shape future academic or SRL engagement. Metacognitive awareness of the motivational conditions and products creates an opportunity to exert metacognitive control as needed. That might involve sustaining motivational cognition (beliefs), behaviour (effort, persistence, engagement), affect (interest, enjoyment, etc.), or changing it in some way. Either way, the value of a self-regulating view of motivation is that it acknowledges the role of situation, educational context, and socio-historical experiences while empowering learners by focusing on things they can control and manipulate—befitting to the practice of school psychology.

Figure 1

Visual Depiction of Winne and Hadwin SRL Model: Its SRL Phases (Top) and COPES Architecture Specific to Motivation Regulation (Bottom)



What Does Research on Motivation and SRL Tell Us?

From a socio-cognitive viewpoint, Zimmerman and Schunk (2008) summarized that motivation is an antecedent, a mediator, and a primary or concomitant outcome from engaging in self-regulation. Viewing motivation as an antecedent to self-regulation, research shows that when learners feel highly efficacious and embrace a growth mindset, they are more likely to engage in deep cognitive processing, explore new strategies, and persist in the face of obstacles (Berger & Karabenick, 2011; Blackwell et al., 2007). Achievement goal is another well-researched antecedent: findings indicate that students who are more concerned about gaining competence (mastery orientation), as opposed to seeking the approval of others (performance orientation), demonstrate more metacognitive awareness and use adaptive strategies during learning (Bernacki et al., 2012; Vrugt & Oort, 2008). Research modeling motivation as a mediator demonstrates that self-efficacy, value beliefs, and enjoyment mediate the effect of students' goals on their strategy use (Chatzistamatiou et al., 2015; Ranellucci et al., 2015). That is, when learners focus on gaining competence, they influence their self-efficacy positively and are more likely to value and enjoy the task, which altogether influences SRL engagement. In terms of motivation being an outcome of SRL, research demonstrates a change in motivational beliefs after engaging learners to reflect on their performance feedback and shift attributions of success and failures to factors within their control (Chodkiewicz & Boyle, 2014). Specifically, by recognizing poor strategy choices as responsible for performance deficiency in a specific task, students tend to improve their self-efficacy for and performance in similar future tasks (Koles & Boyle, 2013).

Research examining self-regulation at the classroom level demonstrates how contexts influence students' motivational beliefs and regulatory actions (e.g., Perry, 1998). Such studies often take a sociocultural approach, arguing that the dynamic interactions between tasks, instructional practices, and interpersonal interactions in the classroom co-create motivational experiences. Extending beyond self-phenomena, co-regulation has been used to refer to the process whereby self-regulatory processes and actions (including motivation practices and beliefs) are gradually appropriated in a supportive context where they are observed, modelled, or prompted (a) by teachers and peers, or (b) within instructional tools or scaffolds (Hadwin et al., 2018; McCaslin, 2009). Classrooms that provide opportunities for learners to self-regulate, such as when they are presented with situations that allow them to make choices and opportunities to self-reflect, tend to foster students' intrinsic motivation (Perry & VandeKamp, 2000; Perry et al., 2018).

Motivation has also been examined as the primary target of regulation (e.g., Wolters & Benzon, 2013). That line of research reveals several strategies students use to regulate motivation, including those specific to controlling (a) behaviour (effort and persistence), (b) cognition or beliefs (efficacy, task appraisals, attributions, and expectancies), (c) emotions (interest, enjoyment, and attitude) and (d) environmental or task features (Bakhtiar & Hadwin, 2020). There are some developmental differences in terms of strategy preference, with younger children being less proficient in manipulating cognition (Cooper & Corpus, 2009). Research also attempts to identify the types of motivation challenges students experienced with an interest in examining how learners respond to different motivational challenges in situ (Bakhtiar & Hadwin, 2020; Järvenoja et al., 2015). The combination of situated challenges (i.e., conditions) and

regulatory responses observed in multiple learning sessions provides opportunities to recognize patterns of (mal)adaptive regulation, informing the design of SRL interventions (Hadwin et al., 2019).

Cyclical View of Motivation Difficulties

When students experience motivational challenges, an opportunity to self-regulate or for school psychologists to support self-regulation arises. Consider the fictional case of Liam as he attempts to regulate motivation during a writing assignment (see Figure 2). Liam's motivational conditions and products are italicized in Figure 2. A snapshot of Liam's internal conditions indicates his efficacy for the task is low, partly because his previous writing assignment did not go well. Furthermore, the fact that the current task is unfamiliar to him and his teacher expects better work to be submitted this time are external conditions shaping his regulatory beliefs and actions moving forward. These conditions are continually changing throughout task work, reshaped as Liam plans, monitors, and modifies his task engagement.

Motivation issues are often a symptom of weak task understanding (Butler & Cartier, 2004; Hadwin & Winne, 2012). In Liam's case, he generated a vague interpretation about the task, which was to write a research essay about an ocean creature. Being unclear about the task details and purpose made it challenging for Liam to muster motivation for the task. He began to feel incapable (maladaptive self-efficacy belief) and looked for a reason to blame his teacher for assigning a boring task (maladaptive attributional belief). These motivational products are commonly observed when students' task perceptions are unknowingly ill-defined or misaligned with assigned work.

Liam continued to the next phase where he set a goal to persist and complete the task. Liam found the task overwhelming because his goal focused on a distal outcome. While persisting is one indicator of motivated behaviour, it can be deleterious to performance and motivation when students persist with the wrong things. For example, if Liam persists toward the goal of completing the paper but does not have a clear idea about what he is writing about, persisting is effort inappropriately applied and unlikely to be successful. Moving from a distal to more a proximal goal would help Liam cope with the task complexity and, simultaneously, help him build efficacy (see research on goal properties for building efficacy such as Schunk, 1990). When goals are more specific and achievable, they provide learners with clearer standards on where they should be going and how they could measure progress (Zimmerman & Kitsantas, 1999). For example, what does Liam want to convey to the reader in this paragraph? How does this relate to the overall thesis of the paper? Notably, constructing these kinds of proximal goals is challenging when task understanding is weak or inaccurate.

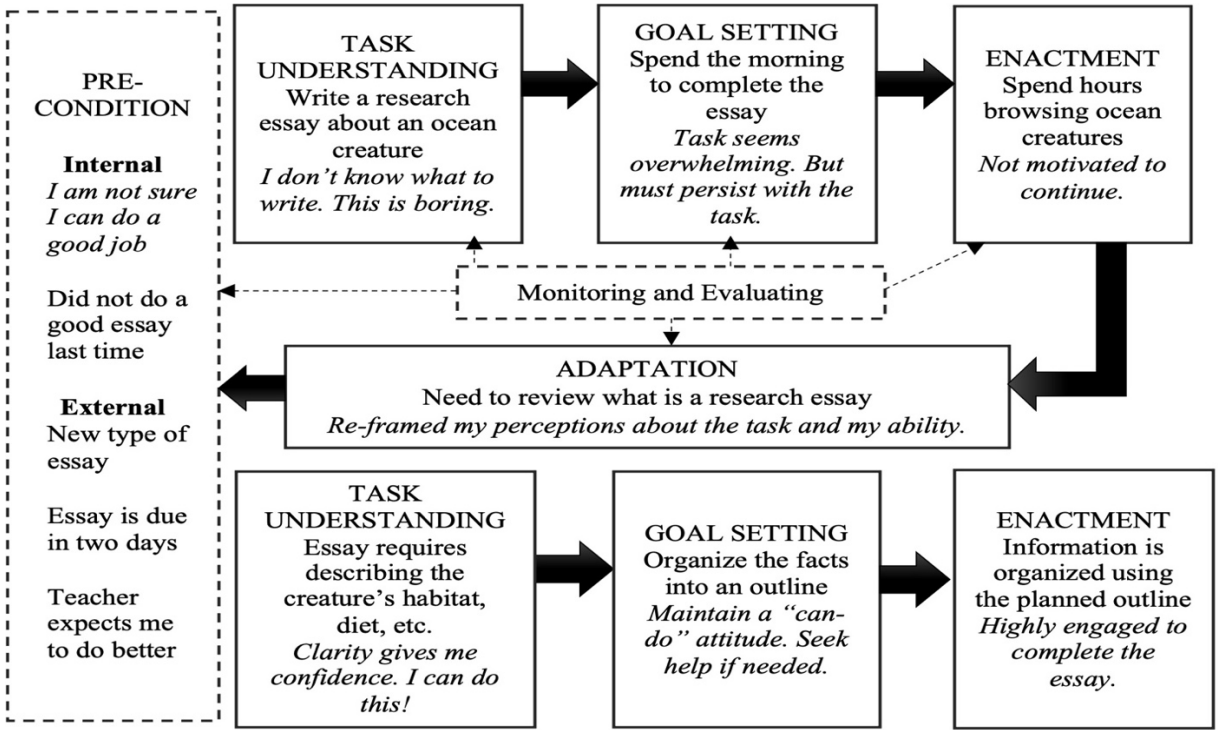
When learners work on tasks and pursue goals, they draw on motivational beliefs and knowledge to make decisions about the amount of effort to apply (see Kruglanski et al., 2002). They weigh beliefs about benefits (value, utility, ability) against beliefs about the costs of engaging in the task (effort, social cost, and possible outcomes). In Liam's case, although the task was judged to be difficult and boring, it was important for him to complete it for his teacher. Lacking a sense of direction, Liam's strategic engagement was shallow. He spent hours browsing the internet and opening multiple browser tabs with information about different ocean creatures,

without any tangible product or plan. Sometimes, students make strategic decisions to avoid a task or procrastinate because they don't believe they can be successful. By disengaging, students feel they can attribute failure to something other than themselves (Koles & Boyle, 2013). Liam, self-regulated by monitoring and evaluating his lack of progress and choosing to make some changes (adaptation). He realized that he needed to review the task instructions and develop a better understanding of the elements needed for a research essay. This led to generating a goal to specifically look for research about how climate changes affect food sources for one type of ocean creature. This action illustrates how having a high metacognitive awareness of multiple aspects of one's learning stimulates adaptation not only in the task itself but also motivational beliefs about success. Now, Liam has a proximal goal that is challenging but achievable today.

Adaptation is an instantiation of a growth mindset. Despite, initially, not feeling motivated, Liam believed he could recover from his previous experience. As in Figure 2, Liam's next iterations of SRL phases showed his renewed sense of task understanding improved his self-efficacy, and allowed him to set more specific and achievable goals. His new goal provided better guidance for choosing and applying an appropriate research strategy. This experience generated new motivational information for Liam about himself, the task, and the task situation that will now form the conditions for future writing tasks.

Figure 2

Liam's Self-regulatory Cycles



Note. Italicized refers to motivational products from each SRL phase which also served as conditions in the following phases.

SRL-Focused Intervention

SRL interventions may draw from different SRL models but invoke common processes, namely planning, monitoring, reflecting, experimenting with strategies, and adapting. SRL interventions have been applied at all levels, from early years (Blair & Razza, 2007), elementary (Dignath et al., 2008; Perry, 2013), secondary (Kitsantas & Cleary, 2016), to tertiary level (Braodbent & Poon, 2015; Wolters & Hoops, 2015), including with gifted students (Stoeger et al., 2015) and students with learning difficulties (Butler & Schnellert, 2015). Despite the diversity, school psychologists rarely engage in SRL assessments or interventions due to (a) limited knowledge of the fundamental tenets of SRL and reliable measures of SRL, (b) logistical challenges at the system level, and (c) instructional time constraints (Cleary 2009, 2021).

Meta-analyses reveal that SRL interventions were most effective when (a) situated within specific learning contents and (b) promoted a high degree of metacognitive reflection and strategic response (Dignath et al., 2008; Dignath & Buttner, 2008; Hattie et al., 1996). Analyses also show that SRL interventions may require an extended amount of time because students need scaffolds and opportunities to practice and develop self-regulatory competencies iteratively based on outcome feedback generated with each attempt. However, the return on investment of SRL interventions in schools is large, with reported effect sizes ranging between .60 and .70 (see Dignath & Buttner, 2008).

SRL interventions are commonly approached in three ways, with some degree of overlap between approaches. First, the intervention may focus on addressing students' maladaptive motivation beliefs to modify students' maladaptive thoughts into more adaptive ones. Second, the intervention may focus on structuring classroom practices that promote positive motivational experiences and strategic engagement. Third, the intervention is introduced at a finer grain by delivering metacognitive prompts and scripts during specific SRL phases or learning episodes.

Intervening with Maladaptive Motivation Beliefs

Maladaptive beliefs include the conviction that one is lacking a capacity to exercise control over one's abilities and outcomes. Learners who exhibit such belief tend to procrastinate (Klassen et al., 2008) and present helplessness, believing there is no benefit in exerting extra effort (Koles & Boyle, 2013). SRL interventions address maladaptive beliefs by targeting control. Control is one of the hallmarks of self-regulation and intervening to modify perception of control tends to be prioritized. This form of intervention involves (a) situational manipulations, which shift students' focus to efficacy-promoting information, or (b) attribution retraining programs, where students address their ways of responding to situations and feedback, and practice changing maladaptive responses to ones that encourage the students to take ownership over their learning.

Schunk and Ertmer (2000) documented several self-efficacy interventions that involve manipulation of efficacy beliefs before and/or while performing a task. The training was founded on the principle that self-efficacy is primarily influenced through experiencing mastery and receiving feedback that reflects individual progress and achievements (Usher & Pajares, 2006).

In one intervention study, Schunk and Swartz (1993) asked a group of fourth- to fifth-graders to pursue a goal focusing on learning to use a writing strategy. Some students were also provided with periodic feedback about their progress during the learning session. The combination of learning goal and progress feedback resulted in the highest self-efficacy and successful strategy use.

An example of an attribution retraining (AR) program is demonstrated in Berkeley et al. (2011) who conducted reading comprehension strategy instruction with, or without, AR to examine the combined effect of both strategy and AR training on students' reading outcomes. Participants were middle-to-high schoolers with learning disabilities who received training for over 4 weeks. The strategy instruction guided students through a sequence of systematic reading processes, from goal setting, previewing, activating prior knowledge, self-questioning, summarizing, to monitoring. In contrast, attribution retraining (AR) involved a series of actions where students (a) learned to identify maladaptive thoughts, (b) practiced using positive self-talk that reinforced strategy use, and (c) reviewed attribution feedback that explicitly drew connections between students' strategy use and their reading performance. Compared to students who received regular instruction, intervention students developed better strategy awareness, performed better on a reading comprehension measure, and demonstrated long-term learning gains. Those who also received the AR showed a larger long-term intervention effect and a higher tendency to attribute success to internal factors (effort, ability, strategy use). This positive effect is particularly important for students with learning disabilities as they are at risk of exhibiting maladaptive beliefs due to experiencing difficulties repeatedly (Koles & Boyle, 2013). Furthermore, the addition of strategy training to the AR is argued to be necessary to avoid asking students to merely work harder, without guiding them to tackle their specific academic challenges (Muenks et al., 2018).

Motivation and SRL Promoting Classroom Practices

Based on extensive classroom observations and interventions, Perry (2013) summarised ways in which self-regulation promoting practices can be integrated into regular classroom instructions (also Perry et al., 2018). Three classroom processes should be considered: (a) task design, (b) instructional practices, and (c) interpersonal interactions. The tasks should offer appropriate levels of challenge and complexity, offer meaningful choices, provide clear and flexible expectations, and extend over a period of time to provide students ample opportunities to exercise metacognition and strategic action. A motivation-promoting classroom has teachers that support autonomy, where directives are rarely used, evaluation practices are non-threatening, and students are invited to self-evaluate their learning and decision-making. Teachers and peers play an important role in co-regulating individual students' self-regulation by posing questions, providing actionable feedback, encouraging self-initiative and experimentation, and modeling strategic actions (Perry & Rahim, 2011). As argued in Perry et al. (2006), these classroom processes correspond well to motivation-promoting practices discussed by motivation researchers, such as in Stipek (1996). The difference is that an SRL perspective, which relied on a social view of learning, emphasized how the practices may be interpreted and experienced

differently by different learners as they dynamically interact with the task and social features in the classroom. Teachers may find integrating SRL-promoting practices in their instruction and responding to the nuances of students' SRL uptake challenging (Dignath & Buttner, 2008; Perry et al., 2006). Supporting teachers to practice and hone their self- and co-regulation skills is necessary and can be provided through professional development and partnerships with SRL researchers (Butler et al., 2004).

A more specialized program for developing students' SRL competencies in schools can be seen in programs such as the Self-Regulated Strategy Development (SRSD, Graham & Harris, 1993) and Self-Regulation Empowerment Program (SREP; Cleary, 2021). The former focused more on direct teaching of study skills in the context of writing and mathematical problem solving, whereas the latter focused more on building self-regulation skills for overcoming day-to-day academic challenges. Regardless, both programs are mostly delivered to a subsection of students who are at-risk academically. In the context of writing instruction, SRSD engages learners to plan, monitor, evaluate, and revise their writing, with the support of an instructor who helps model metacognitive thought processes and provides feedback towards goal attainment. A meta-analysis demonstrates that the inclusion of SRSD into elementary students' writing instruction has proven to improve writing skills significantly (Graham et al., 2012). Similarly, SREP comprises a series of modules that build upon each other: foundational, strategy learning and practice, and self-reflection. With the help of SREP coaches, students are guided through iterative cycles of planning, monitoring, and evaluating. Students work in small groups multiple times per week for three to four months. Evaluations of SREP demonstrate that at-risk students showed significant gains in their achievement and self-regulation practice and competency (Cleary et al., 2017). These programs demonstrate that students' motivation can be influenced indirectly by teaching and guiding them through self-regulatory processes contextualized within authentic academic work.

Prompting and Scripting Adaptive Regulation

Metacognitive prompts and scripts are introduced to support regulation at the task- and situation-specific level. Prompts cue learners to self-monitor and evaluate several aspects of their learning, hinting for needed regulatory actions (Kollar et al., 2006). In contrast, scripts model specific strategy use through specifying and sequencing regulatory actions (Kollar et al. 2006), such as by outlining the steps for constructing a study goal (Hadwin et al., 2019). Prompts and scripts may be delivered in metacognitive planners and journals (Schmidt et al. 2012) or short reflection sessions during an ongoing task (Bakhtiar et al., 2018).

Several interventions focused on students' situational challenges that emerge during authentic learning as opportunities to prompt and script adaptive self-regulation (Hadwin et al., 2019; Järvenoja et al., 2020). Students may not readily become aware of their challenges while performing a task; hence, may need to be prompted to reflect on their situations. For instance, Järvenoja et al. (2019) prompted primary school students to monitor their affective states multiple times during a learning project. Upon identification of a salient emotion, using a scripted tool, students were asked to reason about why that situation might be a challenge and then orchestrate a plan for tackling that challenge. Alternatively, students could also be prompted

to *anticipate* challenges during the Task Understanding phase and to proactively plan for how to tackle those challenges when they occurred (Hadwin et al., 2019; Järvelä & Järvenoja, 2011). Research indicates motivation challenges, for example, are highly anticipated by undergraduate learners, and prompting them to plan has been found to reduce the prevalence of those challenges (Hadwin et al., 2019).

Motivation prompts and scripts may focus on guiding students to use more adaptive tactics or strategies, removing students from adopting passive strategies such as avoiding the task and futile persisting (Bakhtiar et al., 2018; Daumiller & Dressel, 2018). For instance, in Schmidt et al. (2012), secondary school students were prompted to reflect on the personal relevance and utility of their biology tasks using a weekly learning journal. Compared to students who were not given such prompts, those who received the prompts reported a high degree of motivation for biology and showed better comprehension of the learning content. Support for motivation regulation strategies may be differentiated throughout a task, such as in Kim and Bennekin (2016) who introduced different types of motivation regulation strategies during task initiation, performance, and completion phase. The degree of scripting should also be differentiated based on student's age or ability level because younger students may need more direct guidance on strategy enactment (see Järvelä et al., 2012).

Other similarly useful prompts and scripts include those that support deeper cognitive processing of the learning content, such as in Science (Dori et al., 2018; Peters & Kitsantas, 2010). The prompts typically come in the form of metacognitive questioning that encourages students to (a) monitor engagement in key activities in the discipline *(*e.g., *Have you thought about an alternative explanation for that scientific phenomenon?)* or (b) evaluate their task progress and products (e.g., *How well have you understood the passage?)*. Research indicates that the effect of metacognitive prompts may interact with learners' ability levels. Less competent learners often benefit from prompts, whereas highly competent learners do not, likely because the prompts interfered with ongoing thought and motivational processes (Pieger & Bannert, 2018). Overall, research suggests that prompts and scripts must (a) align with the intended instructional purpose, and (b) be provided when needed to avoid cognitive overload or redundancy (Thillmann et al., 2009).

Relevance to the Practice of School Psychology

Motivation and self-regulation issues are commonly referred to school psychologists (Cleary, 2009). However, school psychology programs rarely include extensive training in self-regulation assessments and interventions, making graduates unprepared to implement such interventions in their practice (Cleary, 2011). The overwhelming benefit of developing SRL competency on students' achievement, school readiness, and well-being (e.g., Blair & Razza, 2007), attests to the value of specialized SRL training for school psychologists and active applications of SRL in the practice.

SRL and Motivation Assessment

Conducting assessments is a customary preparatory step for intervention programming in the practice. Self-regulation and motivation can be assessed using aptitude- and event-based measures (Winne & Perry, 2000). Aptitude-based assessments are administered using an inventory or a questionnaire, such as the Motivation and Self-Regulated Learning Questionnaire (Cleary et al., 2010; Koivuneimi et al., 2020). The motivation theories listed in Table 1often include a corresponding questionnaire that practitioners can use (e.g., Children Self-efficacy Scale; Bandura, 2006). The questionnaires can be used for assessing students' persisting motivational beliefs and characteristics, which afford or constraint SRL engagement.

Event-based measures recognize that motivation is dynamic and utilized while learners engage in tasks. Perry's (1998) classroom observation protocol may reveal the dynamic interplay between students' self-regulation practices and their social and task context. Prompts and scripts are also types of assessment tools that can leave traces of students' metacognitive processes and actions and reveal the quality and patterns of their regulation (Perry & Winne, 2013). Some other methods of using trace data include examining (a) work logs students left in an online learning environment (*How often they read task instructions? And how long?*), and (b) learning artifacts such as study notes and assignments (*What types of strategies have they attempted to make sense of a concept?*). Another useful event-based assessment is the think-aloud protocol which captures students' free-flowing ideas while thinking through a task (Green & Azevedo, 2009).

Using multiple types of assessments can enrich understanding of students' self-regulation and motivation. When doing so, students' perceptions of themselves and situations can be contextualized using other forms of data, such as observation of students' behaviour in the situation (Winne et al., 2002). Winne and Hadwin's (1998) SRL cycle and the fictional case illustrated in Figure 2 provide a useful framework and tool for school psychologists to make sense of the data gathered from assessments. Students' data can be mapped unto the four SRL phases to identify potential issues regarding students' SRL processes and products. For example, the Self-regulated Learning Profile and Self-diagnostic Tool (SRL-PSD; Hadwin et al., 2021) was developed to give students a profile of their learning challenges in the context of their self-regulated learning practices. If Liam, our fictional student, were to complete this diagnostic, he would likely see that in addition to heightened motivational challenges, he also tends to neglect practices associated with developing task understanding (e.g., considered what knowledge or big ideas I should demonstrate) and setting reasonable goals (e.g., set goals that will be useful for checking my progress). Having this information makes it easier to trace motivational challenges to the original source, directing students and psychologists to strategies that address the source of the motivation challenges themselves. From a self-regulatory perspective, it is important to help students to make connections between SRL processes and a range of motivational beliefs and outcomes, and understand: (a) how motivational beliefs and challenges impact self-regulatory processes and task engagement, as well as (b) how self-regulatory practices impact motivational beliefs and mindsets.

Another type of assessment that might be useful for our fictional student can be created by completing a daily diary over consecutive days that documents daily challenge encountered during studying, strategies or solutions that were implemented, and the effectiveness of those solutions in terms of those strategies for attaining goals. Mapping these challenge-strategy-outcome patterns has the potential to increase awareness of maladaptive motivation cycles. For example, recording and visualizing these daily experiences (e.g., Hadwin et al., 2019) might increase Liam's awareness that *avoiding the task* (a strategy) in response to waning motivation, continually results in him failing to attain his goals. Recognizing that maladaptive motivation cycles primes Liam to consider trying an alternative strategy such as breaking the task down into proximal goals because it contextualizes the strategy in a personalized self-regulatory experience. In both examples above, motivation assessments were intentionally designed for dual purposes (a) increasing students' metacognitive awareness of their motivation in relation to their self-regulated learning practices, and (b) identifying areas for targeted intervention support.

Classroom Collaboration

School psychologists can promote SRL supportive practices in the classrooms through consultation and collaboration with teachers. This approach shifts the focus away from "fixing" students' motivation towards providing a learning space that promotes students to take control of their situations and self-regulate. Perry (2013) and colleagues' (Perry et al., 2018) recommendations for considering the three classroom processes (task design, instructional practice, and social interactions) provide a holistic way of infusing motivation and SRL practices in the classrooms. While this way of working has proven to be successful in promoting more autonomous motivation amongst students (Butler et al., 2004), practitioners must consider that implementing the guidelines does not guarantee all students will be motivated or that positive motivation is always going to be experienced. This is because not all tasks are inherently motivating to all learners and sustaining motivation requires active self-regulation.

Two points of regulation are relevant in the classrooms. First, teachers must be encouraged to self-regulate their teaching by (a) continually reflecting on students' outcomes, (b) reflecting on teaching practices that create opportunities for motivation regulation, and (c) drawing from students' feedback on the classroom processes through interactive discussions with individual or a group of students. This approach allows teachers to tailor instructional strategies and accommodate dynamically changing needs, contexts, and situations (see Butler et al., 2004). Second, while classroom practices can thwart and support motivation, students need to learn that motivation is under their control and can be regulated with strategies. When a motivation hurdle is experienced, students must learn to recognize that they could control and manipulate their situation, and they are not merely victims of pedagogical circumstances. Flexibly, reflectively, adaptively, and with some support from external others, students should learn to gain an understanding of their motivation as well as factors and valuing processes that contribute to it. Further, students should identify the type of goals, performance standards, and strategies that are conducive to their motivation. Through active self-regulation, it is hoped that learners recognize regulating motivation is not instantaneous; it requires practice at the cost of a greater benefit for learning.

Assisting Parents and Guardians to Support SRL at Home

Parents and guardians can play an important role in fostering self-regulated learning and motivation. Pino-Pasternak and Whitebread (2010) reviewed the literature on parenting and self-regulated learning and identified three types of parenting practices that support self-regulated learning: challenge, autonomy, and contingency. These factors are aligned with SRL-promoting instructional practices researched by Perry and colleagues (Perry et al., 2020). First, parents can be encouraged to expose children to tasks and situations that are cognitively and metacognitively challenging. *Challenging but achievable tasks* are motivating particularly when children perceive they have some sense of control over those situations and the strategies they use to confront those challenges. These types of situations also create multiple opportunities for modelling, sharing, and developing metacognitive talk about motivation, strategies, and self-regulatory practices. Psychologists can also send home to parents and guardians a metacognitive scripts binder that provides examples of metacognitive talks they can engage with their children in various motivationally challenging situations. Second, *autonomy supporting practices* encourage children's independent decision-making and perceptions of control. Rather than solving problems for children, parents can gradually shift responsibility to children supporting them to think about and experiment with potential solutions themselves. Finally, *instrumental support (contingency)* involves (a) tailoring cognitive and metacognitive support to a child's individual needs enabling them to tackle tasks with parents that would be too difficult to tackle alone, as well as (b) being emotionally aware and responsive to children's feelings of self-competence, motivation and mastery as they strive toward increasingly more challenging tasks and goals. To support parents in building a foundational knowledge of these practices, psychologists may have to arrange with the school for a parents' learning night, in which an SRL expert is involved.

Approaching the Practice of School Psychology from An SRL Position

Motivation issues school psychologists confront tend to be deficit-focused. An SRL perspective is useful in these situations because it views motivational deficits as opportunities to learn and practice self-regulation. School psychologists are well positioned to intervene by supporting students to self-reflect and develop metacognitive awareness about their motivation, its sources, and its solutions. Students should develop awareness about the motivational responses they exhibit in a task, factors that might influence those responses, and ways in which they have responded to motivational challenges that were not productive. Assessments and feedback by external others are also helpful for learners to recognize when and how to adapt. The evidence indicates, being aware that motivation is a challenge is an important first step for appropriate self-regulatory control to take shape (Bakhtiar & Hadwin, 2020). Expecting motivation to always be positive across all academic tasks is a naïve belief that fosters task avoidance when motivation becomes a problem. SRL approaches promote confronting challenges directly and considering alternatives to "exit" strategies.

When teaching students self-regulation strategies for motivation, rather than teaching strategies for changing beliefs and mindsets exclusively, other practical learning strategies

proved to be effective should be explored. Strategies that focus on the task content, such as building task understanding and activating prior knowledge before working on a task (e.g., Berkeley et al., 2011) can significantly influence students' task engagement and motivation. Broadening students' strategy repertoire sets them up with skills and competencies for flexibly controlling motivation challenges (Bakhtiar & Hadwin, 2020). School psychologists' unique position allows them to also evaluate the efficacy of specific strategies in school-based settings by considering the contextual conditions under which some strategies would be effective for the population they are supporting.

Finally, infusing SRL-promoting practices in schools effectively requires strong foundational knowledge of SRL theory. Research-practice partnership is a way to achieve this and has shown to be successful in achieving long-term effects, not only on students' motivation but also on teachers' practices (e.g., Butler et al., 2004). Some of these partnerships are operationalized in communities of practice or teacher learning teams (Butler & Schnellert, 2012; Perry et al., 2015). These teams typically meet regularly over a school year, where both researchers and practitioners engage in an iterative process of planning, monitoring, enacting, and adapting—essentially practicing the same self-regulatory processes they wish to promote in students. Similarly, school psychologists are self-regulating agents, who self-regulate their own practices when strategizing ways in which they can best serve their clients. Explicitly engaging in SRL phases as a practitioner may involve (a) developing an understanding of the client's situations or problems by carefully identifying the internal and external conditions impinging upon that problem, (b) constructing intervention goals and standards for monitoring progress and outcomes, (c) experimenting with intervention strategies with clients and in partnership with teachers and parents, and (d) adapting approaches by reflecting on successful and unsuccessful implementations of the intervention. These processes could be fostered more explicitly in graduate training programs, placing psychologists in a better position for supporting others' self-regulatory practices.

Conclusion

Drawing from a self-regulated learning framework, this paper presented a process-based perspective of motivation that contextualizes motivational beliefs and actions as a product of self-regulatory experiences, and a condition for future self-regulatory practices. Framing motivation from a self-regulatory perspective emphasizes the importance of metacognitive beliefs and awareness in supporting learners to take control of motivation by considering both the sources of metacognitive challenges and the strategies most likely to remediate those challenges. Rather than a deficit-view of motivation, this chapter presents a process-view of motivation as an ongoing set of malleable beliefs and practices that can be regulated by learners when sufficient metacognitive and strategy support is provided. Partnerships between learners, teachers, and school psychologists have great potential for supporting learners to strategically regulate motivation by developing metacognitive awareness of their motivational believes and their regulatory sources and by experimenting with strategies to successfully leverage those motivational beliefs for academic success.

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