Self-Regulated Learning: Key strategies and their sources in a sample of adolescent males[1]

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ABSTRACT

This study identified the key self-regulated learning (SRL) strategies and their sources for nine school-aged adolescent males aged 15 to 17 years. The Self-Regulated Learning Interview Schedule (SRLIS) was used along with semi-structured interviews with the participants and their parents to elicit information on SRL strategies and contexts for the formation of self-regulatory habits. Early habit-forming experiences of the family home in relation to homework and study routines were found to form an important base for effective SRL. Teachers were identified as the most common source of SRL strategies with important formative experiences occurring during the first two years of high school.

INTRODUCTION

The self-regulation of cognition and behaviour are important aspects of learning and the extent to which school students become self-regulators of their own learning influences their academic success (Beishuizen & Steffens, 2011; Lyn, Cuskelly, O'Callaghan & Grey, 2011; Zimmerman, 2008; Zimmerman & Schunk, 2011). The skills necessary for self-regulation in academic settings such as schools have been investigated under the rubric of self-regulated learning (SRL) (e.g., Pintrich, 2000, 2004; Svinicki, 2010; Winne, 1995; Zimmerman, 2001; 2008; Zimmerman & Schunk, 2011). Effective self-regulated learners actively set goals, decide on appropriate strategies, plan their time, organize and prioritize materials and information, shift approaches flexibly, monitor their learning by seeking feedback on their performance and make appropriate adjustments for future learning activities (Butler & Winne, 1995; Meltzer, 2007; Puustinen & Pulkkinen, 2001; Winne, 1995; Zimmerman, 1989, 2001).

While SRL as a theoretical framework has been explored from a variety of perspectives (e.g., Zimmerman, 2001), models of SRL development are typically grounded in a social cognitive perspective (e.g., Biemiller, Shany, Inglis, & Meichenbaum, 1998; Zimmerman & Bonner, 1996; Zimmerman & Kitsantas, 2005) in which intellectual development and social functioning are closely related and cannot be separated from the contexts in which they occur (Bandura, 1999). These models suggest that self-regulatory abilities develop gradually over the course of childhood and into adolescence (Bakracevic Vukman, & Licardo, 2010) with self-regulatory competence initially developing from social sources and subsequently shifting to self-sources in a manner that is

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reminiscent of a traditional apprenticeship (Beishuizen & Steffens, 2011; Collins, Brown, & Newman, 1989). For example, Biemiller et al. (1998) suggest a three stage developmental sequence in which learners move from being regulated by others (e.g., instruction and guidance from a teacher) to being able to perform the task with limited guidance (e.g., hints) before reaching a level of internalization or mastery.

   More recently, Zimmerman and Kitsantas (2005) have suggested a four stage process. In the first stage, learners acquire self-regulatory skills and strategies most rapidly from social sources such as observing the processes being modelled, verbal descriptions and social guidance, and feedback. An imitative level of self-regulatory competence is reached when the learner's performance emulates that of the observed model. The internalization of the strategy is the next stage and is apparent through the ability of the learner to use the strategy independently. Zimmerman et al.'s (2005) model features a fourth level of self-regulatory skill development which arises when complex situations demand higher levels of self-regulatory competence in which learners systematically adapt their learning strategies to changing personal and contextual situations.

   A common feature of these models of SRL development is the importance of a master or expert model at the initial stages of skill development (Beishuizen & Steffens, 2011). Bronfenbrenner's ecological model of human development (Bronfenbrenner, 1979, 2005) suggests that those relationships that exist in a young person's microsystem are the driving force for development. For SRL, it is assumed that teachers and parents fulfil this requirement (Schunk & Zimmerman, 1997; Zimmerman, 1998). The aim of fostering the skills necessary for 'life-long learning' in young people has focused attention on teachers' abilities to encourage SRL in the classroom (Dignath & Büttner, 2008) and a range of SRL programs and interventions have been devised (e.g., Cleary & Zimmerman, 2004; Kostons, van Gog & Paas, 2011; Miller, Heafner & Massey, 2009; Ness & Middleton, 2011; Tonks & Taboada, 2011).

   While it has been argued that a major goal of formal education should be to equip students with self-regulatory skills (Bakracevic Vukman & Licardo, 2010; Boekaerts, 1997), the reality is that most secondary school students are not exposed to overt, coherent, and systematic programs such as these (Zimmerman, 2002). Further, in a meta-analysis of 35 SRL intervention studies, Dignath and Büttner (2008) found that interventions were more effective when conducted by researchers rather than regular teachers. The researchers explain this finding by suggesting that teachers lack knowledge about SRL and spend minimal time teaching strategies associated with SRL. Dignath and Büttner's (2008) findings raise questions about the role that teachers play in the development of SRL, especially in the absence of a specific school based SRL intervention program.

   Parents are also assumed to be proximal forces of development for young people. There is considerable evidence to suggest that parents are able to influence the academic and psychosocial development in children and adolescents (e.g., Abar, Carter & Winsler, 2009; Maccoby & Martin, 1983; Purdie, Carroll, & Roche, 2004; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994). High parental involvement, as perceived by the adolescent, has been found to be an important influence on adolescents' self-regulatory behaviours (Purdie et al., 2004). However, it is recognized that during adolescence, young people typically become less reliant on their parents and spend increasing amounts of time with their peers, whose friendships are increasingly complex and valued (Brown & Larson, 2009). Peers and peer groups have the potential to exert significant influence over motivation for learning and for school (Altermatt & Pomerantz, 2003; Berndt & Keefe, 1995; Jones, Estell, & Alexander, 2008).

   Social interactions with peers can lead to the sharing of learning strategies (Manion & Alexander, 1999; Salonen, Vauras, & Efklides, 2005; Schraw & Moshman, 1995) including those that relate to SRL (Jones, Alexander & Estell, 2010; Jones et al., 2008), with the homophily of peer groups and frequency of discussions found to be contributing factors. From a social cognitive perspective, the myriad of individual and social changes that serve to elevate the importance of peers during adolescence may result in a shift in focus away from parents as sources of self-regulatory habits.

The questions of the role of teachers in SRL development, in the absence of a systematic program of SRL development, along with potential shifts in parent and peer relationships during adolescence, make it important to understand how SRL skills are attained in the contexts of home and school. Questions about the types of SRL skills acquired, and from whom, can be explored along with an understanding of how some young people learn to self-regulate effectively than others. This paper reports a retrospective analysis of the development of academic self-regulatory skills in a small sample of school-aged adolescents. This study set out to identify the types of SRL strategies employed by these students, the prevalence of their deployment, and the social sources from which these strategies emerged. The study of the deployment and developmental trajectories of SRL during adolescence, along with a deeper understanding of how proficient self-regulated learners came to be this way, may help shape developmental trajectories for SRL in future students.

METHOD

Participants

Nine adolescent male high school students aged from 15 to 17 years and their parents participated in this study. The student participants all attended a private boys' school located in a large metropolitan city of Queensland, Australia and were drawn from a larger sample (N = 65) who had completed the Strategies for Self-Regulated Learning Survey (SSRLS) (Purdie et al., 2004; Purdie & Hattie, 1996) as part of a wider research project. The SSRLS yields a Global Score which gives an overall indication of the student's self-reported level of SRL, with high Global Scores being indicative of high levels of academic self-regulation (Purdie et al., 2004). The 65 students were placed into rank order based on their SSRLS Global Score and the ten highest ranked students and the ten lowest ranked students were invited to participate in this study. A total of nine students and their parents accepted the invitation and gave their consent to participate. Six of these students were from the top ten highest ranked students (L, N, J, F, W and D) with the other three from the ten lowest ranked students (B, V and H). The student participant's academic standing was judged by inspection and analysis of each participant's three most recent academic reports. The participants with the better SSRLS Global Scores were also the most academically capable (refer to Table 1).

Table 1: Characteristics of the case study participants

Code	Age in years	School grade	Frequency distribution of academic results in previous 18 months				Academic achievement	SSRLS ranking[1]
			A	B	C	D		
L	16	11	40[2]	0	0	0	Excellent	2
N	17	12	36[2]	0	0	0	Excellent	3
J	15	10	27	15	0	0	Very good	5
F	16	11	29	11	2	0	Very good	8
W	15	10	21	18	3	0	Very good	9
D	15	10	29	11	2	0	Very good	10
B	16	11	4	25	13	1	Average	59
V	15	10	10	14	15	3	Average	60
H	15	10	1	8	29	5	Average	64

1. The SSRLS global score for each participant was placed in rank order from highest to lowest.
2. This student studies 6 subjects rather than the usual 7 in the years 11 and 12.

Instruments

The Self-Regulated Learning Interview Schedule (SRLIS) was used to gain an insight into the breadth of SRL strategies used by the student participants and their frequency of use. Separate, semi-structured interviews were used to elicit information relating to daily routines, study habits, sporting commitments, home life, and role models to gain an understanding of the broader context of the participant's life and the development of self-regulatory habits.

SRLIS (Self-Regulated Learning Interview Schedule)

The student participants were interviewed using the SRLIS (Zimmerman & Martinez-Pons, 1986, 1988, 1990) to elicit information about their preferred strategies in response to a series of eight contexts which included revising class work, structuring an essay, completing homework tasks, exam preparation, dealing with distractions and difficult problems, and checking work when completed, and arranging their place of study. Full descriptions of the contexts are provided in Zimmerman and Martinez-Pons (1990).

For each mention of a strategy, the participants were asked to indicate their consistency of use via a visually presented, four point scale with categories of 'seldom', 'occasionally', 'frequently' and 'most of the time'. For the purposes of this study, the participant was then asked 'who did you learn this strategy from?' In the case where the participant did not identify a strategy, a follow-up question was used to prompt for a response. If the participant still did not offer a response, or did not identify any strategies, questioning moved on to the next context.

Semi-structured interviews.

Semi-structured interviews were conducted to gain insights into the development of the student participant's self-regulatory skills. The student and his parent(s) were interviewed separately with the questions adapted to suit. For example, the following questions were used with the students: *Tell me about your daily routine for an average weekday.... You have indicated on the questionnaires that you have a regular study schedule. Please tell me a bit about it.... How did you develop this schedule?* The following questions were put to the parent participants: *Tell me about his daily routine for an average weekday.... Tell me about his study habits.... How did he develop these habits?* The full list of interview questions is available from the first author on request.

Procedure

Ethical clearance for this study was obtained in accordance with the National Health and Medical Research Council's Statement on Ethical Conduct in Human Research (2007). The SRLIS interview was conducted by the first author in a one-on-one situation and was recorded verbatim using a digital voice recorder for later transcription. The SRLIS interview took between 15 and 30 minutes to complete.

The responses for each SRLIS context were coded according to 15 categories of self-regulated behaviour identified by Zimmerman and Martinez-Pons (1986) as shown in Table 2. For this study, category 13 was modified to include Internet resources. This adaptation was considered necessary given the increasing presence of computers and Internet access in the daily lives of the students.

The most comprehensive method of scoring the SRLIS is to weight each mention of a strategy with its frequency of use. This approach reflects the breadth and consistency with which participants are engaging in SRL strategies. As a result of this coding and scoring, the SRLIS is considered to have a higher degree of substantive validity than interviews that code responses using post hoc categories (Pintrich, Wolters, & Baxter, 2000).

Table 2: Self-regulated learning interview schedule coding categories.

Category of strategy	Definition
1. Self-evaluation	Statements indicating student-initiated evaluations of the quality or progress of their work, e.g., 'I check over my work to make sure I did it correctly.'
2. Organizing and transforming	Statements indicating student-initiated overt or covert rearrangement of instructional materials to improve learning, e.g., 'I make an outline before I write my paper.'
3. Goal-setting and planning	Statements indicating student setting of educational goals or subgoals and planning for sequencing, timing, and completing activities related to those goals: e.g., 'First, I start studying two weeks before exams, and I pace myself.'
4. Seeking information	Statements indicating student-initiated efforts to secure further task information from non-social sources when undertaking an assignment, e.g., 'Before beginning to write an assignment, I go to the library and get as much information as possible concerning the topic.'
5. Keeping records and monitoring	Statements indicating student-initiated efforts to record events or results, e.g., 'I took notes of the class discussion.' Or 'I kept a list of words I got wrong'.
6. Environmental structuring	Statements indicating student-initiated efforts to select or arrange the physical setting to make learning easier, e.g., 'I isolate myself from anything that distracts me.' Or 'I turn off the radio so I can concentrate on what I am doing.'
7. Self-consequences	Statements indicating student arrangement or imagination of rewards or punishment for success or failure, e.g., 'If I do well on a test, I reward myself to a movie.'
8. Rehearsing and memorizing	Statements indicating student-initiated efforts to memorize material by overt or covert practice, e.g., 'In preparing for a maths test, I keep writing the formula down until I remember it.'
9-11. Seeking social assistance	Statements indicating student-initiated efforts to solicit help from peers (9), teachers (10), and adults (11), e.g., 'If I have problems with maths assignments, I ask a friend to help.
12-14. Reviewing records	Statements indicating student-initiated efforts to reread notes (12), textbooks (13) or access other multimedia/internet resources (14) to prepare for class or further testing, e.g., 'When preparing for a test, I review my notes.'
15. Other	Statements indicating learning behaviour that is initiated by other persons such as teachers or parents, and all unclear verbal responses, e.g., 'I just do what the teacher says.'

(Adapted from Zimmerman & Martinez-Pons, 1986).

To gain an insight into the original source of the different SRL strategies, when the participants mentioned an SRL strategy during the SRLIS interview, they were asked '*who did you learn this strategy from?*'

The semi-structured interview with the student participants was conducted by the researcher immediately following the SRLIS interview and took between 20 and 40 minutes to complete. The semi-structured parent interviews were conducted at a location of the parent's choosing. These interviews were conducted by the first author with one or both parents present and were recorded verbatim using a digital voice recorder for later transcription.

RESULTS AND DISCUSSION

The first part of this section presents an overview of the types of self-regulated learning strategies identified by the individual participants during the SRLIS structured interview. Subsequent sections explore how the participants developed these strategies.

SRL Strategies

Each participant's weighted frequency of response for the 15 classes of self-regulated behaviour identified by Zimmerman and Martinez-Pons (1996) are shown in Table 3.

The frequencies for the different SRLIS categories ranged from zero to just over 20. Each participant had a unique profile of reported SRL strategy use. The participants with higher SSRLS scores (L, N, J, K, W, & D) identified a wider range, and more prevalent use, of SRL strategies than the lower ranked participants (B, V & M). This finding, limited as it is by the small sample size, offers some support to the understanding that successful students engage in a greater range of self-regulatory skills, and more often, than lower achievers (Ablard & Lipschultz, 1998; Cordingley et al., 1998; Purdie & Hattie, 1996). The finding also may also be a reflection of academically able students' capacity for more reflection and identification of their SRL habits than their less capable peers.

Each participant's profile typically featured three or four categories with frequencies suggesting a preference for the SRL strategies associated with these categories. For the higher ranked students, the categories with the highest frequencies were: *Self-evaluation* (K,W,D); *Organizing and Transforming* (L,N,J); *Goal-setting and Planning* (L,J,K,W); *Environmental Structuring* (N,K,D); *Reviews notes* (N,J,W); and *Reviews texts* (L,D). Each of these categories is typically associated with self-directed, self-initiated processes that do not involve or rely on other persons. This preference towards

Table 3: Weighted frequency distribution for SRLIS Self-regulated learning interview schedule coding categories.

	Student								
	L	N	J	K	W	D	B	V	H
Self-evaluation	4	7	8	15	11	12	1	0	7
Organizing and transforming	17	12	14	4	9	6	4	3	4
Goal-setting and planning	17	7	16	14	21	4	0	4	6
Seeking information	4	8	4	5	3	3	0	0	0
Keeping records and monitoring	8	8	4	0	0	4	0	3	3
Environmental structuring	4	10	8	10	8	10	2	3	8
Self-consequences	4	4	4	0	8	0	0	0	0
Rehearsing and memorizing	14	7	4	0	4	7	0	2	0
Seeks assistance – peers	0	0	0	3	2	2	4	4	3
Seeks assistance – teachers	3	3	1	4	4	5	8	6	7
Seeks assistance – adults	3	0	2	4	7	2	5	6	2
Reviews notes	9	15	16	4	11	4	0	3	0
Reviews texts	13	7	3	3	4	10	2	3	0
Reviews multimedia/internet	0	0	5	3	0	0	5	6	7
Other	0	0	0	0	0	0	0	0	0

internalized processes is further evidenced by the relatively low frequency scores for strategies associated with the three *Seeks assistance* categories. In contrast, the lower ranked participants appear to preference SRL strategies associated with social sources, with the highest frequency of responses in the categories of *Seeks assistance from teachers, Seeks assistance from adults,* and *Reviews multi-media/internet*.

This difference in preference may indicate that higher ranked participants are more advanced, relative to lower ranked participants, in their progression through the general developmental sequence of self-regulated learning proposed by social cognitive models of SRL development. In the later stages of these models, learners move from relying on social sources of regulation to internal sources. The more academically capable students in this study appear more self-reliant than the less capable students. This may be a reflection of higher levels of self-regulatory skills, and higher levels of other factors that support SRL, such as self-efficacy and motivation.

Sources of self-regulated learning

During the SRLIS interview, participants were asked to identify the source for each SRL strategy they mentioned. Six coding categories were formulated that reflected participants' responses (Table 4).

Teachers were identified as the most common source of SRL strategies. Personal experience, Parents and Home life, and 'Not sure' were also frequently identified. The 'Not sure' category was inflated by the responses of participant L. Siblings and peers were mentioned the least number of times. This finding suggests that, while peers play an increasingly important role in the lives of adolescents, peers are not replacing parents or teachers as the prime source of SRL habits during adolescence.

During the semi-structured interviews with the participants and their parents, the sources of SRL skills were explored in depth. The following sections present findings derived from these interviews, with the discussion structured around the six categories identified in Table 4.

Teachers.

Seven of the nine participants most frequently identified teachers as their source of particular SRL strategies. The higher ranked participants reported formative experiences with teachers that were generally associated with Years 8 and 9 (the first two years of high school) and were categorized into

Table 4: Frequency distribution of self-identified sources of SRL strategies.

	Student									
	L	N	J	K	W	D	B	V	M	Total
Teachers	4	8	13	8	13	7	2	4	3	62
Parents & Home life	6	2	2	3	2	4	6	0	2	27
Siblings	0	0	4	3	0	0	1	1	1	10
Peers	0	0	0	0	0	0	2	3	2	7
Personal experience	8	6	4	2	4	2	0	3	1	30
Not sure	14	6	7	2	1	2	4	0	2	38
Total	32	22	30	18	20	15	15	11	11	174

three types: overt teaching of thinking strategies; teacher expectations; and teacher supplied 'artefacts.'

The identification of overtly taught thinking strategies was most often associated with mathematics classes where teachers explained how to think about problems, how to break them down and solve them in an ordered manner, and to revise their work. In terms of models of SRL development, these experiences provide obvious links to the early stages of skill acquisition where learners observe processes being modelled, described verbally, and receive social guidance and feedback. Feedback is a catalyst for all self-regulated activities (Butler & Winne, 1995), and effective feedback from teachers is one of the most important influences on achievement (Hattie & Timperley, 2007).

The finding that overt teaching of strategies was most often associated with mathematics classes parallels that of Dignath and Büttner's (2008) meta-analysis of SRL intervention studies. The analysis found that interventions conducted in mathematics attained higher effects than in other areas. The expectations of teachers were identified as having a formative impact on SRL habits. For example, participant J described his year 8 science class:

> we had to be really organized because we did lots of experiments.... we didn't have time for anything else... it was really good, but we had to be very organized...if you weren't you couldn't do the experiment.... you had to be up to date with the work she (the teacher) set from the text book as well. She was tough... but I learnt a lot (J).

These experiences appear to link with the second stage of the SRL acquisition models: an imitative level of self-regulatory competence is reached when the learner's performance emulates that of the observed model.

 In some cases, the formative experience involved a teacher supplied 'artefact.' These artefacts included videos on effective study habits, graphic organizers, and research planners. For example, N spoke of a research planner that he received in year 8

> … it helps me structure my assignments... what information I'm going to include... what is important or not (N).

Given that N was still making use of the research planner more than four years after it was provided by a teacher indicates that the benefits of graphic organizers and teacher supplied planners (e.g., Avila & Baetiong, 2012; Guerra, 2009; Lee & Tan, 2010) can last for substantial periods of time. N's comments also suggest that he has reached the third stage of Zimmerman et al.'s (2005) SRL acquisition model: internalization of the strategy and the ability of the learner to use the strategy independently.

While participants pointed to teachers as important sources of SRL skills, in many cases, participants could not identify a specific teacher or moment in time, instead making general comments such as: *I have had lots of good teachers…. I don't know…. I guess I try and do what they tell me to do…. (M).* While an average performing student such as M seems to be able to identify 'good teachers' as models to observe and emulate, the development of effective SRL habits is more nuanced than this. Zimmerman and Kitsantas (2005) argue that the first signpost on the path to successful SRL development occurs at the observational stage and requires the correct form of the skill to be modelled. Further, induction to a skill rarely emerges from a single exposure but usually requires repeated observation across a variety of tasks (Zimmerman et al., 2005).

The organizational structure of the typical Australian secondary school means that students are exposed to many teachers during their adolescent years. In the absence of a coherent program of SRL development or metacognitive coaching, the process of discernment for individual students is likely to be *ad hoc* (Eccles & Roeser, 2011). In addition, self-regulated learning is closely linked to motivation (Cleary & Zimmerman, 2012; Efklides, 2011; Kadhiravan, 2012; Bakracevic Vukman & Licardo, 2010; Zimmerman & Moylan, 2009). The discernment process required in the early stages of SRL

development, and the need for sustained practice and refinement of skills during latter stages of development, may require greater level of motivation and engagement in learning (Ziegler, Stoeger & Grassinger, 2011; Zimmerman, 2000) that most students are willing to invest.

While teachers appear to be a dominant source of SRL strategies for the participants in this study, the results from the SRLIS indicate that 'seeking assistance from teachers' is not a dominant set of SRL strategies for the higher ranked participants. This finding suggests that these students are less reliant on their teachers for assistance and guidance than the lower ranked students. Higher ranked participants may have internalized and adapted their SRL processes to a level where they are confident in their own ability and do not require the scaffolding that a teacher might provide. This was evidenced by participant N's statement:

> Teachers often have different ways they want you to do things, but it gets to the point where you have the freedom to draw upon several things that you have learnt (N).

In terms of the stages of self-regulatory development proposed by Zimmerman et al. (2005) and Biemiller et al. (1998), this reduced need for teacher support shows students operating at more advanced stages of SRL development.

Parents and Home Life

The parents of the participants in this study reported that they were all proactive in their child's upbringing, making generous investments of time and energy in their children. An emergent theme from the interviews with the parents was the importance of habit-forming routines during childhood. This theme was communicated by the mothers of high ranking participants in particular, for example:

> .... from an early age I always tried to maintain a routine with him, especially around meal time and bath time, reading time and bed time... so when he went to school it was never an issue.... he just got into the habit of doing homework, reading time, bedtime... I wasn't that strict, but there was a regular routine (N's mother).

Another mother put it this way:

> I guess we are very organized people and that does come through I suppose, if we are organized then our children are going to be organized... (L's mother).

One mother admitted that she was very strict:

> He was our first son...so we were very strict when he was young... this is bed time, you go to bed! (W's mother).

Studies have shown that an authoritative approach to parenting is associated with positive outcomes (such as school performance and psychosocial development in a range of areas) for young people, while authoritarian or permissive parenting is more often associated with negative outcomes in these areas (Maccoby & Martin, 1983; Steinberg, Mounts, Lamborn, & Dornbusch, 1991). The early, habit-forming experiences established by the parents of this study appear to have links with the first stages of the models of acquisition of self-regulation and appear to have paid dividends for participants. For example, higher ranked students reported that they were able to absorb the extra work associated with higher school grades into their established routines.

The importance of routines was reinforced when the participants were asked to describe their typical school day. Participants revealed that they lived hectic lives with many commitments within school and beyond. In addition to their normal load of school subjects, all were involved in sporting or musical pursuits. The most academically capable participants were also the ones with the busiest schedules. This finding echoes that of Purdie et al. (2004) who found that young people who are academically regulated are also likely to be self-regulated in other aspects of their lives.

All of the participants indicated that, in the absence of after school sporting or musical commitments, they preferred to begin their homework each afternoon soon after arriving home. The lower ranked participants revealed that they completed their work before dinner, leaving the evenings free for watching television, browsing the Internet, or playing computer games. In contrast, the higher ranked participants would usually return to their place of study and continue working until bed time. All of the participants indicated that they had their own dedicated study space, usually a desk in their own room, and all took steps to modify their study environment to limit distractions. These environmental modifications usually involved closing doors, turning off music, and arranging books or folders into a study sequence.

The busy lives of participants suggests that they have developed skills in organization and planning. The SRLIS profiles for the higher ranked participants shows a greater preference for strategies associated with Organizing and Transforming and Goal setting and Planning categories than the lower ranked participants. This finding was confirmed through the semi-structured interviews. The most able participants liked to be organized. According to his mother, L, for example,

> …likes to know exactly where everything is... and he is very regimented, so everything has its place. There is a place for everything... so before he goes to bed, everything is in its place for tomorrow (L's mother).

This includes his school books

> .... he has them all in his bag from the first period to the last period, everything is just so.

N believes that

> organization is a big part of me. Say if I have an assignment due in three weeks, I will try and get it done as quickly as possible regardless of what it is. So if I know that I am getting stuff done early I know that I am organized (N).

When asked to elaborate on how he came to be such an organized person, N stated:

> I think it has always been the case because for me it seems like the intelligent thing to do but in recent years I have made a conscious effort to exacerbate it in that I just get things done very early. Of course I prioritize school work over music and then social stuff somewhere lower than that (N).

In contrast, the lower ranked participants did not report the same level of internalization of routines or habits. For example, participants B and M reported commencing homework only after reminders from parents. Participant B's profile of SRL sources indicated that his parents were the most frequently reported source of SRL strategies.

This exploration of the home lives, parental input, and daily routines of the participants and their impact of these on their SRL habits provide support for the social cognitive models and a developmental sequence for SRL. The early, habit-forming experiences of childhood in relation to homework and study routines seem to have been internalized by the higher ranked participants. As workloads increased throughout high school, these participants seemed incrementally to modify their internalized routines to accommodate the extra work. These routines were encouraged by a supportive parent. The lower ranked participants appear not to have reached this level of internalization or mastery of routines. They remain willing to be regulated by others.

Siblings and Peers

Siblings and peers were identified as sources of SRL strategies but less often than teachers and parents. Older siblings were identified by five participants (J, K, B, V and M). W and D were the eldest in their families and so did not have older siblings. None of the participants identified younger siblings as a source of SRL strategies. This suggests that participants developed their SRL strategies from observations and shared experiences with older siblings. However, the quality of the relationship between the participant and the older sibling may play a role in imparting SRL strategies. Of all the participants, J attributed the greatest number of SRL strategies to his older siblings. A

contributing factor for J's attributions may be the substantial age gap between him and his siblings who were 8 and 10 years his senior. This age gap was unusually large and may have led J to see his older siblings as mature and worldly. J's mother reported that he …. *adores his brother* and may have been motivated to emulate him. In contrast, N reported contempt for his brother who was only slightly older than himself. N did not attribute any SRL strategies to his brother.

None of the higher ranked participants reported their peers as a source of SRL strategies. The SRLIS profiles indicate that higher ranked participants were less likely to turn to their peers for assistance than lower ranked participants. However, the peers of higher ranked participants may be important 'reference points' for academic comparisons. For example, K's mother stated that her son was friends with

..... two or three other boys who are all very intelligent, all very competitive…. they are the closest of friends and they challenge each other ….. and that is where he has got so many skills from… (K's mother).

K's mother revealed that these students no longer attend the same school as K. It is interesting to note that Jones et al.'s (2008) study of peer relationships and SRL found that an adolescent's discussions with peers beyond their own class or school have more significant associations with SRL than those discussions with peers from the same class. This highlights the potential gain for young people in maintaining a wide network of peers, an undertaking that is relatively easy with the proliferation of communication technologies and web-based social networking sites.

Not sure and Personal Experience

Most participants responded that they were unsure of the source of at least one of their SRL strategies. For participant L, 'unsure' was his most frequent response. In many cases the participants indicated that they adopted a strategy because *it seemed like a logical thing to do (N)* or that the strategy arose from personal experience. It is likely that the more academically capable and effective self-regulated learners have reached a level of internalization and mastery of the self-regulatory skills necessary for academic achievement. They are regularly adapting and "fine tuning" their academic habits in an incremental manner, and, as such, the starting point for any one strategy may become clouded. It is possible that this process of ongoing incremental change to SRL techniques, noted with higher ranked participants, may be the results of high levels of motivation and regular self-reflection.

CONCLUSION

This study identified the types of academic self-regulatory skills deployed by a small sample of school-aged adolescents and explored the source of these skills. The more academically capable participants reported using a wider range of strategies, and more often, than the less academically capable participants. In addition, the more academically capable participants seemed to have a preference for strategies associated with self-directed, self-initiated processes that do not involve or rely on other persons. In contrast, the less academically capable participants appear to prefer SRL strategies associated with social sources such as seeking assistance from peers, teachers, and adults. These findings suggest that the more academically capable participants are more advanced in their progression through the developmental sequence of SRL strategies outlined in social cognitive models of SRL development. Teachers were the most commonly identified source of various SRL strategies. Teacher-led experiences that promote self-regulatory skills in the early years of high school were valued. Despite this, seeking assistance from teachers was not the dominant set of SRL strategies for the more academically capable students. These students are no longer as reliant on their teachers for self-regulatory guidance as the less academically capable students.

This implies that, even in the later stages of high school, some students may not have internalised SRL strategies and that guided practice and scaffolding may still be required. Students' preference for social sources for self-regulatory habits, as well as the elevated importance of peers during adolescence, may make these sorts of students more amenable to advice and modelling of SRL strategies by peers. Further investigation of this hypothesis using a larger sample group that includes learners with a range of academic abilities and stages of SRL development is planned.

The early, habit-forming experiences of the family in relation to homework and study routines appeared to be an important foundation for SRL during later years. Students with well-established routines associated with self-regulated study were able to make incremental modifications to accommodate increases in workload throughout high school. This foundation is supported into adolescence by parents via a home life that encourages the learner to maintain a self-directed study routine. Parents should be interested and involved in their child's school work. They should encourage the formation of routines in relation to homework and study well before children enter high school.

The limitations of this study need to be kept in mind when interpreting these findings. The generalizability of the finding is limited by the small sample size and the relatively homogeneous nature of the participants who were volunteers from a single boys' school. Future studies in this area could involve a larger sample drawn from a range of schools and socio-economic backgrounds. A second limitation of this study was the use of structured and semi-structured interviews during which the participants were asked to identify and reflect upon their self-regulatory habits and strategies. This approach required a high degree of self-awareness and metacognition on the part of participants. Those with modest metacognitive skills may lack the self-awareness and reflective skills necessary to make accurate judgements about their self-regulatory skills. As a result, they may have inflated perceptions of their own competence in using self-regulatory strategies (Ehrlinger & Dunning, 2003; Dunning & Kruger, 1999). Future studies may make use of triangulated data, including that from parents, teachers, and students to ascertain the accuracy of students' own perceptions of their self-regulatory skills and habits.

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