

Spring 4-30-2016

Examining Change in Elementary Aged Students' Self-Regulation for Learning

Kelsey Losenno

King's University College, kloenn2@uwo.ca

Follow this and additional works at: https://ir.lib.uwo.ca/psychK_uht



Part of the [Psychology Commons](#)

Recommended Citation

Losenno, Kelsey, "Examining Change in Elementary Aged Students' Self-Regulation for Learning" (2016). *Undergraduate Honors Theses*. 39.

https://ir.lib.uwo.ca/psychK_uht/39

This Dissertation/Thesis is brought to you for free and open access by the Psychology at Scholarship@Western. It has been accepted for inclusion in Undergraduate Honors Theses by an authorized administrator of Scholarship@Western. For more information, please contact tadam@uwo.ca, wlsadmin@uwo.ca.

Examining Change in Elementary Aged Students' Self-Regulation for Learning

Kelsey Losenno

King's University College *at Western University*

London, Canada

Thesis Advisor: Lynda R. Hutchinson, Ph.D.

Abstract

Self-regulation (SR) describes how individuals control thoughts and actions to respond to environmental demands and attain goals. The purpose of this study was to examine how teachers' perceptions of elementary aged students' SR changed during a school year. Four main research questions were addressed: (1) What is the relationship between students' SR and academic achievement? (2) Do teachers' perceptions of students' SR change during the school year? (3) Do demographic variables (e.g., sex) influence teachers' perceptions of students' SR? (4) How do some students struggle with SR? Data consisted of two waves of teachers' ratings of students' SR and academic achievement using the Self-Regulation In School Inventory (SRISI). Findings indicated that SR was a statistically significant predictor of academic achievement at Time 1 (T1) and Time 2 (T2). A two-way ANOVA with repeated measures confirmed a statistically significant within subjects effect of time indicating that teachers' perceptions of students' SR were statistically significantly higher from T1 ($M = 4.38, SD = 1.29$) to T2 ($M = 4.51, SD = 1.33$). Also, the ANOVA demonstrated that the demographic variable sex had a statistically significant effect on SR at both time points, $F(1, 120) = 15.38, p < .01, \eta^2 = .11$, indicating a medium to large effect. Boys had statistically significantly lower ratings of SR at T1 ($M = 3.99, SD = 1.21$) and T2 ($M = 4.07, SD = 1.24$) compared to girls at T1 ($M = 4.8, SD = 1.26$) and T2 ($M = 4.98, SD = 1.27$), respectively. Finally, students' SR scores were standardized and a subsample of students' ($n = 16$) whose SR was "at risk" was examined. Students in the subsample were predominantly younger boys (12 males). "At risk" students' SR scores improved from T1 to T2, however the results were not statistically significant. The theoretical and practical implications of these findings are situated with in a larger discussion of elementary school students' SR for learning.

Acknowledgements

I recognize and appreciate the endless support from my advisor Lynda Hutchinson, who has taught me about self-regulation in the most self-regulating fashion possible. My indebtedness to Devon Trower for her data collection work. Lastly, my thanks to my family for always loving and supporting me.

Examining Change in Elementary Aged Students' Self-Regulation for Learning

Self-regulation (SR) refers to individuals' engagement in adaptive and effective patterns of cognition and behaviour to respond to environmental stimuli and achieve goals (Zimmerman, 2008). SR involves basic executive functions (e.g., inhibitory control, attention focusing, and working memory) (Diamond, 2013), plus the application of higher order processes such as metacognition, motivation, and strategic action, which are implicit in SR (Zimmerman, 1990; Perry, Hutchinson & Thaugberger, 2007; Zimmerman & Schunk, 2011; Diamond & Lee, 2011; Hutchinson, 2013). Metacognitive individuals are aware of their strengths and weaknesses in relation to task demands (Perry, Phillips & Hutchinson, 2006). Motivation is demonstrated in an individuals' approach to challenging tasks. Motivated individuals are more likely persist on challenging tasks when they perceive the merits of acquiring new skills (Perry et al., 2007). Lastly, strategic action refers to ones' behavioural enactment of metacognition and motivation. Strategic individuals deliberately choose from their repertoire of learning tactics and implement them to achieve their goals (Perry, 1998; Zimmerman, 1990; Hutchinson, 2013). Together these concepts reflect a social cognitive framework of SR, which demonstrates a cyclical interdependence of basic executive functions and higher order processes, that are context specific (Winne & Perry, 2000; Zimmerman, 2008; Perry & Rahim, 2011).

Studies have demonstrated that students' development of and engagement in SR is linked to positive academic and social outcomes such as mastery goals for learning, high levels of positive affect and higher levels of academic achievement (Linnenbrink, 2005; Whitebread & Bingham, Pasternak, & Sangster, 2007). For example, Blair and Razza's (2007) study of kindergarteners' SR and emerging maths and literacy skills, found that attending self-regulation based preschool program increased mathematic knowledge and ability as well as verbal

knowledge and ability. Additionally, SR has been found to be a reliable predictor of academic success (Diamond, Barnett, Thomas, & Munro, 2007) and school adjustment (Blair & Diamond, 2008).

However, poor and ineffective SR is related to maladaptive patterns of cognition, emotion, and behaviour (Perry, 1998, 2013). Students' who engage in ineffective SR tend to exhibit higher levels of negative affect, poor executive functions (i.e., trouble focusing attention, remembering information, and inhibiting behaviour), and lower levels of socioemotional competence (e.g., perspective taking). Typically, students who employ maladaptive learning practices have low motivation for learning, avoid challenging tasks and procrastinate, all of which have been demonstrated to contribute to lower levels of academic performance and success (Cooper, Shaver & Collins, 1998; Mikulincer, Shaver & Pereg 2003; Graziano et al., 2006; Winne, 1995). However, research has indicated that individuals differ in their development of and engagement in SR (Hutchinson, Perry, Yee, Restrepo, Dantzer, & Lo, 2015; Zimmerman, 1990). Individual differences in SR are associated with learning and achievement differences in classrooms and at school (Eisenberg, Spinrad, Fabes, Reiser, Cumberland, Shepard et al., 2004).

A review of the developmental and educational psychology literatures has indicated that researchers (e.g., Hutchinson, 2013; Hutchinson & Perry, under review) have identified at least three core targets of SR: Emotional Regulation (ER), Self-Regulated Learning (SRL) and Socially-Responsible Self-Regulation (SRSR), which are discussed in turn, below. This study holds the view that all three aspects of SR (ER, SRL and SRSR) involve metacognition, motivation, and strategic action and actively contribute to students' development of and engagement SR while learning in classroom contexts (Hutchinson, 2013).

Emotional Regulation

Emotional regulation (ER) refers to an individual's attempts to regulate emotional arousal in order to pursue learning goals by employing each of metacognition, motivation, and strategic action (Graziano et al., 2007; Eisenberg & Spinrad, 2004; Hutchinson, 2013). Within the classroom context, metacognition in ER is recognized as a child's ability to effectively identify and communicate their emotional states such as anxiety, frustration, and anger. Children display motivation to modulate emotional arousal by sustaining positive attitudes towards learning. Additionally, children partake in strategic action for ER by developing strategies that aid in coping with negative emotion in order to maintain their learning (e.g., seeking peer assistance for difficult tasks; Hutchinson 2013).

Recent studies have indicated that children's development of and engagement in ER predicts executive functioning and positive social and academic outcomes. A longitudinal study of emotional reactivity, ER, and executive functioning was conducted with young children at 15 months old and again at 48 months old (Ursache, Blair, Stifter and Voegtline, 2013). The findings of this study demonstrated that high emotional reactivity and high ER in 15 month olds was predictive of high executive functioning at 48 month olds. Moreover, this study indicated children who had high emotional reactive and low ER at 15 months old predicted the lowest executive functioning at 48 months old. Together, these data provide evidence that ER influences the relationships among the environment, the infants' biological underpinnings and long term developmental outcomes.

Emotional and instructional supports within the classroom are known to support children's academic success, although to date, findings are inconclusive with respect to who provides these supports (Hamre & Pianta, 2005). Furthermore, there is a large body of data to

suggest that the quality of teacher-child relationships can predict academic success. For instance, Rudasill & Rimm-Kaufman (2009) examined the extent to which child temperaments (shyness, effortful control) and gender contribute to the quality of their teacher-child relationships. Results demonstrated that children who were not shy and displayed lower levels of effortful control had more teacher-student conflicts than their peers. Moreover, compared to girls, boys tended to exhibit lower levels of effortful control and had more negative teacher-initiated interactions. These findings indicate that poor ER in early childhood may contribute to poor teacher relationships and lower levels of academic achievement.

In an investigation of kindergarten students' ER and their academic success, Graziano et al. (2006) found that when controlling for IQ, children with higher ER obtained higher scores on teacher reports of academic success and classroom productivity. Additionally, students with higher ER were more successful on standardized math and literacy tests and were found to have higher quality of teacher-student relationships. Interestingly, high quality teacher-student relationships yielded higher scores for children on maths and literacy tests (Blair & Razza, 2007).

Taken together, the findings from these studies illustrate that children who display higher levels of ER have significant advantages in school. As such, studying contexts that foster and develop ER in early childhood is significant given the advantages of early and continued ER development and the threat of negative outcomes of poor ER in children.

Self-Regulated Learning

Self-regulated learning (SRL) describes academically effective patterns of academic learning that involve metacognition, motivation for learning, and strategic action (Zimmerman & Schunk, 2011). Metacognition for learning is evident in children who assess their strengths and

weaknesses as a learner and consequently regulate their behaviours to fit their strengths (Perry et al., 2007). Motivation for learning is displayed when children choose to attempt complex tasks in order to gain deeper knowledge (Perry, 2013). Strategic action is the effective application and monitoring of children's metacognition and motivation (Perry et al., 2007). Together, these higher order processes, when effectively implemented and practiced provide a host of positive academic outcomes (e.g., better perspective taking skills, higher levels of cognitive engagement, motivation for learning; Eisenberg et al. 2004; Perry & Winne, 2006).

For example, Perry (2013) reported on her observational analyses on the relationships between features of writing and portfolio tasks and SRL in five grade two classes. The analyses focused on how the relationships between writing tasks, authority structures and portfolio evaluations related to children's perceptions of control, support, beliefs, values and expectations about writing and the regulation of writing behaviours. Perry's (2013) findings indicated that complex tasks, authority structures, and non-threatening evaluation practices create an atmosphere that foster and develop students' SRL. Students in high SRL classrooms emphasised the intrinsic value that they place on writing skills with one student stating "[I want] to see you interested in my writing". Moreover, they did not place any extrinsic value on their writing tasks and portfolios. In comparison, students who were in low SRL classrooms placed extrinsic value on their writing (e.g., would want authority structure to recognize that "most of it is right") or did not care about the value of their writing. These findings demonstrate that features of learning contexts can promote or curtail young learners' development of and engagement in metacognition, motivation, and strategic action for SRL.

A longitudinal study was conducted to observe and analyse how independent and group learning activities facilitate instances of metacognition and SR (problem solving, planning, peer

tutoring; Whitebread et al., 2007). Findings of this study suggested that different learning contexts afford students different opportunities to employ SRL and metacognitive skills. Furthermore, data revealed strong observational evidence, suggesting that SRL and metacognitive behaviours were employed most often in learning tasks that are child-initiated, occur in small groups and are highly collaborative in nature.

Together, the implications from the literatures findings provide insights into the different contexts that provide children with opportunities to facilitate and exercise SRL skills. Given that SRL abilities in young children provides a host of positive academic out comes (e.g., motivation for learning, higher math and literacy scores; Perry & Winne, 2006; Blair & Razza, 2007), studying the contexts that effectively foster and develop SRL is purposeful. Continued research is necessary to understand how students' SRL develops throughout the academic year.

Socially Responsible Self-Regulation

In her research, Hutchinson (2013) identified socially responsible self-regulation (SRSR) as a third target of SR. SRSR refers to individuals' application of self and other awareness plus social competence to effectively regulate interactions with peers that support learning. Metacognition for SRSR involves the ability to maintain a sense of ones' own strengths and weaknesses as well as the strengths and weaknesses of peers (e.g., recognizes how much support peers need for learning). Children are motivated to support their peers' learning through collaboration (e.g. is committed to including other children in learning activities). Additionally, children who engage in SRSR effectively apply strategies that foster individual and peer learning in a socially responsible manner (e.g., referring a peer to information/books that can assist that peer with a project or task; Hutchinson, 2013).

SRSR was formulated from a body of research on prosocial and socially responsible behaviours, which themselves, have been demonstrated to predict positive social and academic outcomes during the elementary and middle grades. An investigation of the relationship between grade three students' prosocial behaviours and later academic success displayed that early prosocial behaviour significantly predicts academic achievement and social affiliations into the eighth grade (Caprara, Barbaranelli, Pastorelli, Bandura & Zimbardo, 2000). Additionally, Wentzel (1993, 1994) displayed that middle school students who engage in social responsibility goals perceive a higher degree of social support and are more academically successful.

These conclusions demonstrate that the pursuit of prosocial behaviour and social responsibility goals are related to the development of learning strategies, which are implicit in SRL. Given these findings, SRL theory needs to consider which components of prosocial behaviour promote academic success. Furthermore, the contexts in which SRSR is fostered and developed are not discernable.

Individual Differences in Self-Regulation

Some studies (Diamond & Lee, 2011; Hutchinson et al., 2015) indicate that demographic factors, may place some students 'at risk' in their development of adaptive and effective SR (e.g., ER, SRL, and SRSR). In particular, boys tend to be rated as having lower levels of behavioral inhibition (Diamond & Lee, 2011) as well as effortful control (Rudasill & Rimm-Kaufman, 2009). These perceived deficits in boys' SR might contribute to higher levels of conflict in their relationships with teachers and more problem behaviors (Rudasill & Rimm-Kaufman, 2009). Moreover, research has not considered the relationship between demographic variables (e.g., sex) and potential emerging differences between young students' development of and engagement in SR.

The Present Study

The present study examines changes in elementary students' SR (e.g., ER, SRL, and SRSR). Research has highlighted that the development of SR in early elementary has a host of academic advantages (Blair & Razza, 2007). The traditional focus of SR research has involved students enrolled in the upper elementary and middle school grades as well as students from the college and university levels of education. Also, most research about SR attends to maladaptive and ineffective patterns of SR rather adaptive and effective patterns found in typically developing students (Hutchinson, 2013). Given that the early development and support of SR is a precursor for academic success and life outcomes there are research advantages of focusing on early elementary year students (Blair & Razza, 2007; Blair & Diamond, 2008; Diamond et al., 2007). As such, there is a growing interest in understanding elementary school children's development of SR and especially sociodemographic factors that may place some students at a disadvantage in their development of it. This study examined how teachers' perceptions of children's SR (ER, SRL, and SRSR) changed during the school year. Four research questions and hypotheses were posed in the present study:

1. What is the relationship between students' SR and academic achievement?

It was hypothesized that students SR scores would be a statistically significant predictor of academic achievement at T1 and T2

2. Do teachers' perceptions of students' SR change during the school year?

It was anticipated that teachers' perceptions of students' SR would show a statistically significant increase from T1 to T2.

3. Do demographic variables (e.g., sex) influence teachers' perceptions of students' SR?

It was expected that the sociodemographic variable, sex with have an effect on teachers' ratings of students SR such that boys would receive statistically significantly lower ratings of SR compared to girls at both T1 and T2.

4. How do some students' struggle with SR?

Finally, it was expected that students who struggled with SR would have trouble meeting learning expectations for ER, SRL, and SRSR.

Method

Design

This study employed a longitudinal research design to address the four main research questions.

Participants

Participants included 11 elementary school teachers (2 males) and 122 elementary school students (63 boys) from a large urban school district outside of Toronto, Canada (see Table 1). The school district serves a full range of socioeconomic and ethnic groups. Student participants ranged from junior kindergarten to grade 6 and were included in the present study given they had complete data records at T1 and T2.

Measures

Studying young children's SR is challenging, and self-reports are often unreliable measures to employ with young children due to their retrospective nature and differences in children's language development (Whitebread & Basilio, 2011). However, the SRISI have been shown to provide reliable and valid representations of students' SR situated in everyday tasks and activities that transpire in classroom contexts (Hutchinson & Perry, under review).

Academic Achievement

Teachers provided an assessment of children's academic achievement using a 7- point Likert scale that is anchored at four scale points such that Achievement Level 1 (1), Achievement Level 2 (3), Achievement Level 3 (5), Achievement Level 4 (7). The rating scale for this item corresponds to the Ontario Ministry of Education's Grading Standards because no standardized achievement data are available for learners before Grade 4.

Self-Regulation In School Inventory

This study employed the 22-items from the SRISI to measure students' SR – ER, SRL, and SRSR. Teachers rate the SRISI items using a 7-point Likert-scale with endpoints ranging from 1 (never true) to 7 (always true).

Emotional Regulation. Six items measure behaviour associated with ER (e.g., “Can express/communicate needs and desires”).

Self-Regulated Learning. Nine items measure behavior associated with SRL (e.g., “Is willing to try challenging tasks”).

Socially Responsible Self-Regulation. Six items measure behavior associated with SRSR (e.g., “Adjusts feedback and support to suit peer's particular learning needs”).

Demographic information form

A demographic information form was distributed to classroom teachers to collect information about their classrooms. Teachers were asked to indicate the number of students in the classroom (e.g., number of boys and girls), the number of students from a visible minority background, the number of students who spoke English as a second language, and the socioeconomic status of the classroom.

Procedures

Data collection for the present study took place during two time points: a two-week interval in February 2015 (T1), and a two-week interval in June 2015 (T2). Participating teachers were provided with release time to complete the paper and pencil demographic form and an electronic questionnaire containing the achievement and SRISI items. Teachers completed one set of achievement and SRISI items for the students who participated in their classroom.

Results

Results of the present study are presented in order of the research questions posed at the outset of this study.

Research Question 1: What is the relationship between students' SR and academic achievement?

Descriptive statistics were computed for the main study variables at both time points (see Table 2). A series of two multiple regression analyses were employed to answer the first research question. Findings demonstrated that SR was a positive and statistically significant predictor of academic achievement at T1, $F(2,119) = 75.2, p < .001$, adjusted $R^2 = .55$, and T2, $F(2,119) = 50.53, p < .001$, adjusted $R^2 = .45$, both tests confirm a large effect (Kirk, 1996).

Research Question 2: Do teachers' perceptions of students' SR change during the school year?

To answer the second research question, a two-way 2 (sex: boys or girls) X 2 (time: T1 and T2) mixed ANOVA with repeated measures was employed to examine changes in teachers' perceptions of students' SR from T1 to T2. Results indicated that there was a statistically significant within subjects effect of time on SR, Wilk's Lamda = .96, $F(1, 120) = 5.59, p = .02$, $\eta^2 = .05$, indicating a small to medium effect size (Kirk, 1996). Teachers' ratings of students' SR

were statistically significantly higher from T1 ($M = 4.38, SD = 1.29$) to T2 ($M = 4.51, SD = 1.32$).

Research Question 3: Do demographic variables (e.g., sex) influence teachers' perceptions of students' SR?

The two-way repeated measures ANOVA also provided results for the third research question and demonstrated that the demographic variable sex had a statistically significant between-subjects effect on SR over time, $F(1, 120) = 15.38, p < .01, \eta^2 = .11$, indicating a medium to large effect (Kirk, 1996). That is, boys received statistically significantly lower ratings of SR at T1 ($M = 3.99, SD = 1.21$) and T2 ($M = 4.07, SD = 1.24$) compared to girls at T1 ($M = 4.80, SD = 1.27$) and T2 ($M = 4.98, SD = 1.27$), respectively (see Figure 1).

Research Question 4: How do some students' struggle with SR?

To examine how some learners may struggle with SR, students' scores on the SRISI were standardized. Students whose SR scores were at or below one SD of the sample mean were deemed "at risk" (see Table 3). Our subsample ($n = 16$) was comprised mainly of boys (12 males) who tended to be younger than their same aged peers. A paired samples t-test was employed to examine whether students in the "at risk" group improved in their SR from T1 to T2. Results demonstrated these students improved in their SR from T1 ($M = 2.14, SD = .64$) to T2 ($M = 2.35, SD = .60$) and this finding was approaching statistical significance, $t(1, 15) = 2.06, p = .05$.

To further understand how some students may struggle with SR, an item analysis was conducted for the ER, SRL and SRSR subscales of the SRISI (see Figures 2, 3, 4). These analyses demonstrated that students who struggle with SR are being rated as consistently

displaying low academic motivation, having difficulty expressing ones' needs and making poor evaluations of what is required to meet expectations for academic tasks.

Discussion

The purpose of this study was to examine how teachers' perceptions of elementary aged students' SR changed during a school year. Findings from this study indicated that SR predicted academic achievement at T1 and T2. Moreover, findings demonstrated that teachers' perceived that students' SR improved from T1 to T2 in their regulation of affect, learning, and social interactions. In addition, this study found that that the demographic variable sex had an effect on teachers' ratings of SR at both time points such that boys received lower ratings of SR at T1 and T2 compared to girls. Finally, a subsample of students' whose SR was "at risk" ($n=16$; 12 boys) was examined. Findings from this study indicated that "at risk" students' SR increased from T1 to T2, however the results were not statistically significant.

Our initial research question asked "What is the relationship between students' SR and their academic achievement?" Our hypothesis, that students' SR is a strong, consistent predictor of their academic success received support. These findings are consistent with previous literature (Blair & Razza, 2007; Diamond et al., 2007), and highlight the value and importance of supporting learners ongoing development of and engagement in SR for learning and academic success in the elementary school years.

Our second research question was "Do teachers' perceptions of students' SR change during the school year?". Our findings demonstrated that teachers' perceptions of students' SR improved during the school year. These findings confirm the hypothesis that students' SR can improve during the school year. These findings were consistent with the previous works (Perry, 2013; Whitebread et al., 2007) which indicated that different features of learning contexts

can promote or curtail young learners' development of and engagement in metacognition, motivation, and strategic action for SR.

Our third research question asked "Do demographic variables (e.g., sex) influence teachers' perceptions of students' SR?". Results of this study demonstrated that boys received lower ratings of SR compared to girls at both time points. These results corroborate the results of previous research (Hutchinson, 2013; Matthews, Poniz, & Frederick, 2009; Wentzel, 1993) indicating that demographic factors such as sex effect teachers' perceptions of students SR. These findings contribute to the SR literature as they indicate that boys tend to be perceived as engaging in lower levels of SR and that this perception persists during the school year. As such, boys' academic success may be at a disadvantage given that students who employ ineffective SR tend to develop maladaptive patterns of cognition, emotion, and behaviour (Perry, 1998, 2013). Moreover, our findings align with previous works that suggest boys are likely to exhibit higher levels of negative affect, poor executive functions (i.e., trouble focusing attention, remembering information, and inhibiting behaviour), and lower levels of socioemotional competence (e.g., perspective taking) all of which contribute to poor academic outcomes (Cooper et al., 1998, Mikulincer et al., 2003, Graziano et al., 2006). The differences documented in this study confirm that individuals differ in their development of and engagement in SR (Hutchinson, et al., 2015; Zimmerman, 1990) and that these differences in SR are associated with learning and achievement differences (Eisenberg et al., 2004). The continued refinement of instructional processes and educational policies can be used to accommodate differences for all learners and increase their potential for academic success.

To answer our final research question "How do some students' struggle with SR?" we determined which students' SR development was 'at risk'. Our Findings demonstrated that the

'at risk' subsample consisted mostly of younger boys. Moreover, 'at risk' students were consistently perceived as consistently employing maladaptive and ineffective forms of SR. These findings suggest that demographic differences may place more boys 'at risk' in their development of adaptive and effective SR. These differences may arise due to the tendency for boys to be rated as having lower effortful control and more conflict in their teacher relationships as compared to girls (Rudasill & Rimm-Kaufman, 2009).

Additionally, findings from this study indicated that students in the 'at risk' subsample improved in their SR from T1 to T2. However, these findings did not reach statistical significance which suggests that students whose SR development is 'at risk' may not be improving at the same rate as their peers. Furthermore, educators may not struggle to facilitate SR in their classrooms as they may not receive the necessary support and education regarding developmental differences in SR. Research that qualitatively analyzes classroom features can provide insight into instructional practices that facilitate the effective and adaptive use of SR in students. Furthermore, these analyses allow us to understand how some struggle to facilitate students SR.

To further understand how some students may struggle with SR, we conducted an item analysis for the ER, SRL and SRSR subscales of the SRISI (see Figures 2, 3, 4). These item analyses reveal exactly how the 'at risk' subsample is performing on each item of each subscale. Moreover, the analyses displayed that 'at risk' students are perceived as employing maladaptive and ineffective forms of SR (ER, SRL and SRSR) and consistently display low academic motivation, the inability to express ones' needs or desires and make poor evaluations of what is required to meet expectations of academic tasks. This information provides us with an

opportunity to consider how instructional processes and educational policies specifically facilitate or curtail the growth and development of SR in elementary aged students.

Limitations and Directions for Future Research

It is important to acknowledge some limitations of the current study. First, given the longitudinal nature of this study, it is possible that the chosen sampling times in February and June, may influence our study's findings. If the sample time in February had taken place earlier, it is possible that the demonstrated findings may be more pronounced as it takes place earlier in the school year there may be lower SR scores at the first time point. Alternatively, had the time point been prior to February it is possible that SR scores may not accurately reflect students' SR as there may be difficulties in transitioning between grades, classrooms, instructional processes, peer bases and potentially schools. The second time point in June may be situated closely in time to summer vacation which may cause restlessness in children and inaccurately reflect students' SR. A final limitation of this study is that findings may not generalize to other regions of Canada due to the sociodemographic characteristics of our sample (e.g., race, ethnicity, socioeconomic status).

Future research should consider the use of mixed-methods and longitudinal research designs to provide larger, in- depth studies of SR for learning. Additionally, researchers, educators and policy makers should continue to work together to develop instructional resources that provides rich and effective information regarding the implementation and facilitation of SR for learning. Our findings have implications for researchers and educators and underscore the need for educators to be informed about students' SR and individual differences in learners' development of it. Also educators need ongoing opportunities and support to facilitate SR in their classrooms during the school year.

Conclusion

The present study offers insight into the relationship between children's SR and academic success. Findings of this study corroborated previous research and our own hypotheses that SR was a strong predictor of academic success and is perceived as increasing during the school year. Moreover, these findings demonstrated that young boys and girls SR scores are significantly different and that young boys' SR was consistently rated lower compared to girls. Additionally, the study's findings revealed that it is typically boys younger than their same aged peers whose SR development is 'at risk'. Although this study revealed that children in the 'at risk' group improved in their SR over time, their SR may not be improving at the same rate as their peers, during the school year. Lastly, item analyses of the SRISI subscales (ER, SRL, SRSR) demonstrated that 'at risk' students are consistently perceived as engaging in poor forms of SR. While no conclusions regarding causation can be drawn due to the correlational nature of this study, this study's findings have provided the opportunity to further consider how instructional processes and educational policies promote or curtail the development of SR in elementary aged students. Moreover, these findings serve as an opportunity for researchers, educators and policy makers to work collaboratively to bridge gaps between educational theory and educational practice.

References

- Blair, C., & Diamond, A. (2008). Biological processes in prevention and intervention: The promotion of self-regulation as a means of preventing school failure. *Development and Psychopathology, 20*(3), 899-911.
- Blair, C., & Razza, R.P. (2007) Relating effortful control, executive function, and false belief understanding to emerging math and literacy abilities in kindergarten. *Child Development, 78*, 647-663.
- Caprara, G. V., Barbaranelli, C., Pastorelli, C., Bandura, A., & Zimbardo, P. G. (2000). Prosocial foundations of children's academic achievement. *Psychological Science, 11*(4), 302-306.
- Cooper, M. L., Shaver, P. R., & Collins, N. L. (1998). Attachment styles, emotion regulation, and adjustment in adolescence. *Journal of Personality and Social Psychology, 74*, 1380-1397.
- Diamond, A. (2013). Executive functions. *Annual Review of Psychology, 64*, 135-168
- Diamond, L. M., & Aspinwall, L. G. (2003). Emotion regulation across the life span: An integrative perspective emphasizing self-regulation, positive affect, and dyadic processes. *Motivation and Emotion, 27*(2), 125-156.
- Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4-12 years old. *Science, 333*, 959-964.
- Diamond, A., Barnett, W.S., Thomas, J., & Munro, S. (2007). Preschool program improves cognitive control. *Science, 318*, 1378-1388.
- Eisenberg, N., & Spinrad, T. L. (2004). Emotion-related regulation: Sharpening the definition. *Child Development, 75*(2), 334-339.

- Eisenberg, N., Spinrad, T. L., Fabes, R. A., Reiser, M., Cumberland, A., Shepard, S. A., et al. (2004). The relations of effortful control and impulsivity to children's resiliency and adjustment. *Child development*, 75(1), 25-46.
- Grau, V. & Whitebread, D. (2012). Self and social regulation of learning during collaborative activities in the classroom: The interplay of individual and group cognition. *Learning and Instruction*, 22(6), 401-412.
- Graziano, P. A., Reavis, R. D., Keane, S. P., & Calkins, S. D. (2007). The role of emotion regulation in children's early academic success. *Journal of School Psychology*, 45(1), 3-19.
- Hadwin, A. F., & Oshige, M. (2011). Self-regulation, co-regulation, and socially shared regulation: Exploring perspective of social in self-regulated learning theory. *Teachers College Record*, 119(2), 240-264.
- Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72, 625-638.
- Hamre, B. K., & Pianta, R. C., (2005). Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure?, *Child Development* 64, 949-967.
- Hutchinson, L. R. (2013). *Young Children's Engagemnet in Self-Regulation at School* (Doctoral dissertation). Retrieved from https://circle.ubc.ca/bitstream/.../ubc_2013_fall_hutchinson_lynda.pdf?...1
- Hutchinson, L. R., & Perry, N. E. (2014) Development and Validation of the SRISI. Manuscript submitted for publication.

- Hutchinson, Perry, Yee, Restrepo, Dantzer, & Lo (2015, August). Demographic variables in children's self-regulation. Poster session presented at The American Psychological Association Annual Conference, Toronto. ON.
- Kirk, P. E. (1996). Practical Significance: A Concept Whose Time Has Come. *Educational and Psychological Measurement, 56*(5), 746-59
- Linnenbrink, E. A. (2005). The dilemma of performance-approach goals: The use of multiple goal contexts to promote students' motivation and learning. *Journal of Educational Psychology, 97*, 197-213.
- Matthews, J.S., Poniz, C.C., Frederick, J. (2009). Early gender differences in self-regulation and academic achievement. *Journal of Educational Psychology, 101*, 689-704.
- Mikulincer, M., Shaver, P. R., & Pereg, D. (2003). Attachment theory and affect regulation: The dynamics, development, and cognitive consequences of attachment-related strategies. *Motivation and Emotion, 27*(2), 77-102.
- Perry, N. E. (1998). Young children's self-regulated learning and contexts that support it. *Journal of Educational Psychology, 90*, 715-729
- Perry, N. E. (2013). Understanding classroom processes that support children's self-regulation of learning. *British Journal of Educational Psychology, Monograph Series II: Psychological Aspects of Education—Current Trends 10*, 45-68.
- Perry, N. E., Hutchinson, L. R. & Thauberger, T., (2007). Mentoring student teachers to design and implement literacy tasks that support self-regulated reading and writing. *Reading & Writing Quarterly, 23*, 27-50

- Perry, N. E. & Rahim, A. (2011). Studying self-regulated learning in classrooms. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 122-136). New York: Routledge.
- Perry, N. E., & Winne, P. H. (2006). Learning from learning kits: gStudy traces of students' self-regulated engagements with computerized content. *Educational Psychology Review*, *18*(3), 211-228.
- Rudasill, K., & Rimm-Kaufman, S. (2009). Teacher-child relationship quality: The roles of child temperament and teacher-child interactions. *Early Childhood Research Quarterly*, *24*(2), 107-120.
- Stuhlman, M. W., & Pianta, R. C. (2002). Teachers' narratives about their relationships with children: Associations with behavior in classrooms. *School Psychology Review*, *31*, 148-163.
- Spinrad, T. L., Eisenberg, N., Cumberland, A., Fabes, R. A., Valiente, C., Shepard, S. A., & Guthrie, I. K. (2006). Relation of Emotion-Related Regulation to Children's Social Competence: A Longitudinal Study. *Emotion (Washington, D.C.)*, *6*(3), 498-510.
- Ursache, A., Blair, C., Stifter, C., & Voegtline, K. (2013). Emotional reactivity and regulation in infancy interact to predict executive functioning in early childhood. *Developmental Psychology*, *49*(1), 127-137.
- Wentzel, K.R. (1993). Does being good make the grade? Social behaviour and academic competence in middle school. *Journal of Educational Psychology*, *85*, Whitebread, D., Bingham, S., Grau, V., Pasternak, D. P., & Sangster, C. (2007). 357-364
- Wentzel, K.R. (1994). Relations of social goal pursuit to social acceptance, classroom behavior, and perceived social support. *Journal of Educational Psychology*, *86*, 173-182.

- Whitebread, D., Bingham, S., Grau, V., Pasternak, D. P., & Sangster, C. (2007). Development of metacognition and self-regulated learning in young children: The role of collaborative and peer-assisted learning. *Journal of Cognitive Education and Psychology, 3*, 433-455
- Whitebread, D., & Basilio, M., (2011). The emergence and early development of self-regulation in young children. *Profesorado, 16*(1), 16-33.
- Winne, P. H. (1995). Inherent details in self-regulated learning. *Educational Psychologist, 30*, 173-187.
- Winne, P.H., & Perry, N. E. (2000). *Measuring self-regulated learning*. In M. Boekarts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation*
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist, 25*, 3-17.
- Zimmerman, B. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal, 166*-183.
- Zimmerman, B. J., & Schunk, D. H. (2011). *Handbook of self-regulation of learning and performance*. New York: Routledge.

Table 1.

Descriptive Statistics for Students at T1 and T2

Variable	Mean	SD
T1 Age	7.68	2.47
T2 Age	8.05	2.67

Table 2.

*Descriptive Statistics for the Self-Regulation and Academic Achievement Variables for all**Students at T1 and T2*

Variable	Mean	SD
T1 Self-regulation	4.38	1.29
T1 Academic achievement	4.26	1.61
T2 Self-regulation	4.51	1.33
T2 Academic achievement	4.45	1.43

Table 3.

*Descriptive Statistics for the Self-Regulation and Academic Achievement variables at T1 and T2**for 'At Risk' Students*

Variable	Mean	SD
T1 Self-regulation	2.14	.64
T1 Academic achievement	2.19	1.11
T2 Self-regulation	2.35	.60
T2 Academic achievement	2.75	1.24

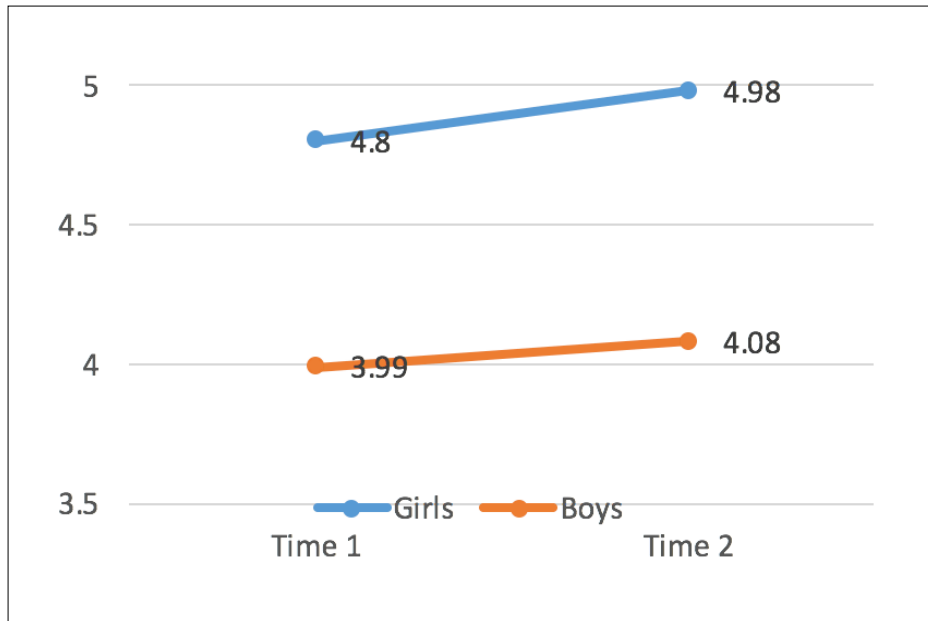


Figure 1. Change in boys and girls' SR from T1 to T2

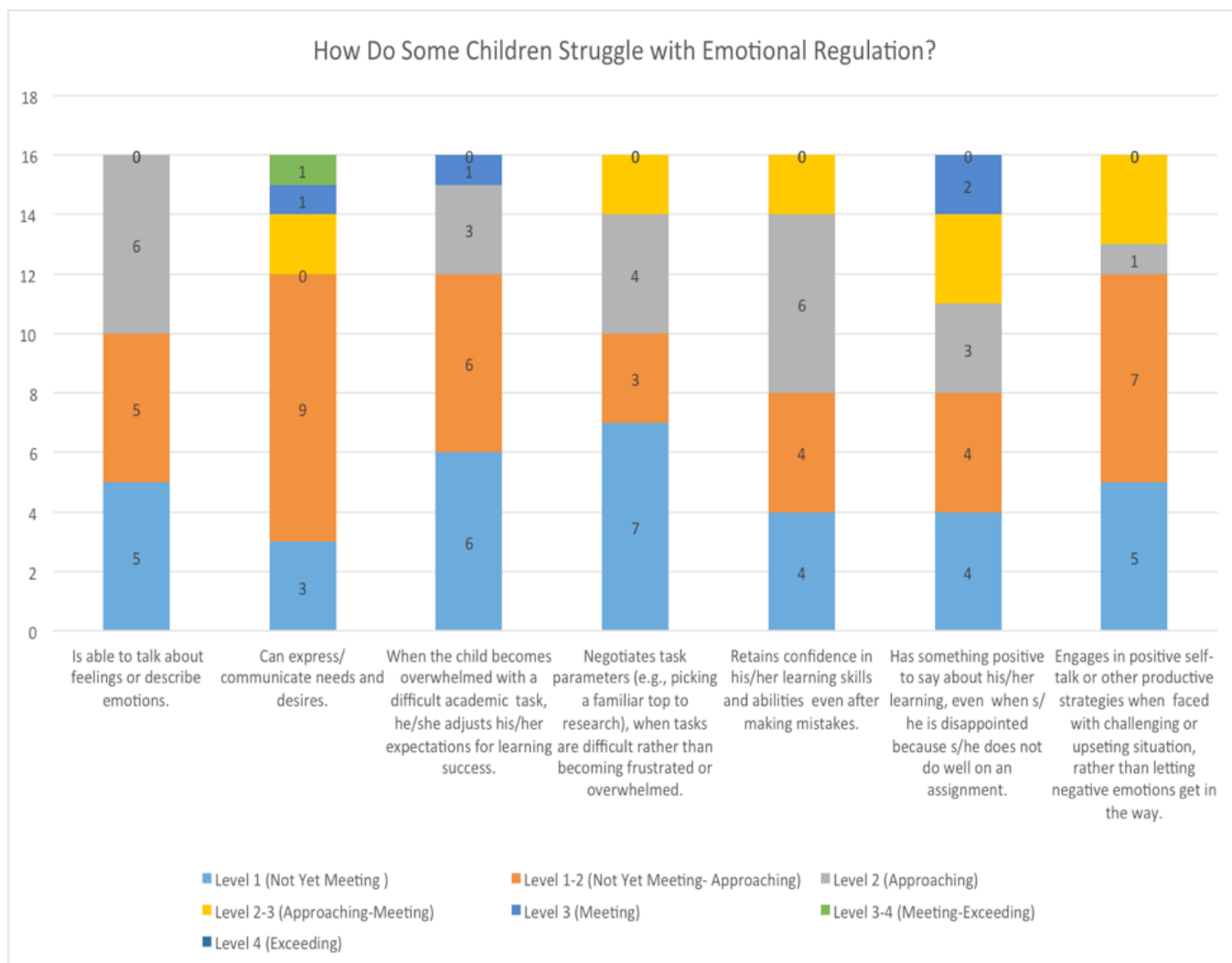


Figure 2. Item analysis for ER subscale of SRISI for 'at risk' subsample

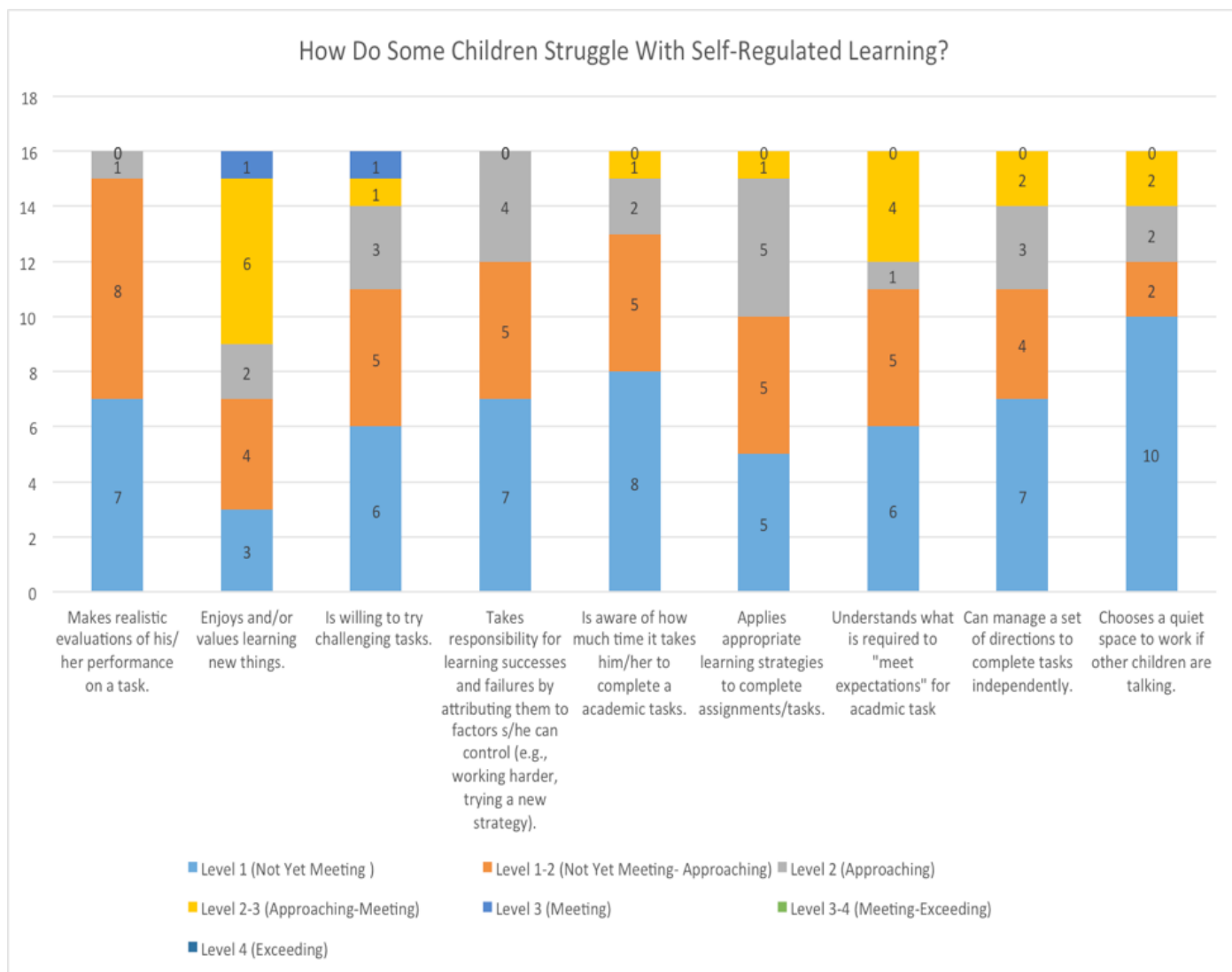


Figure 3. Item analysis for SRL subscale of SRISI for 'at risk' subsample

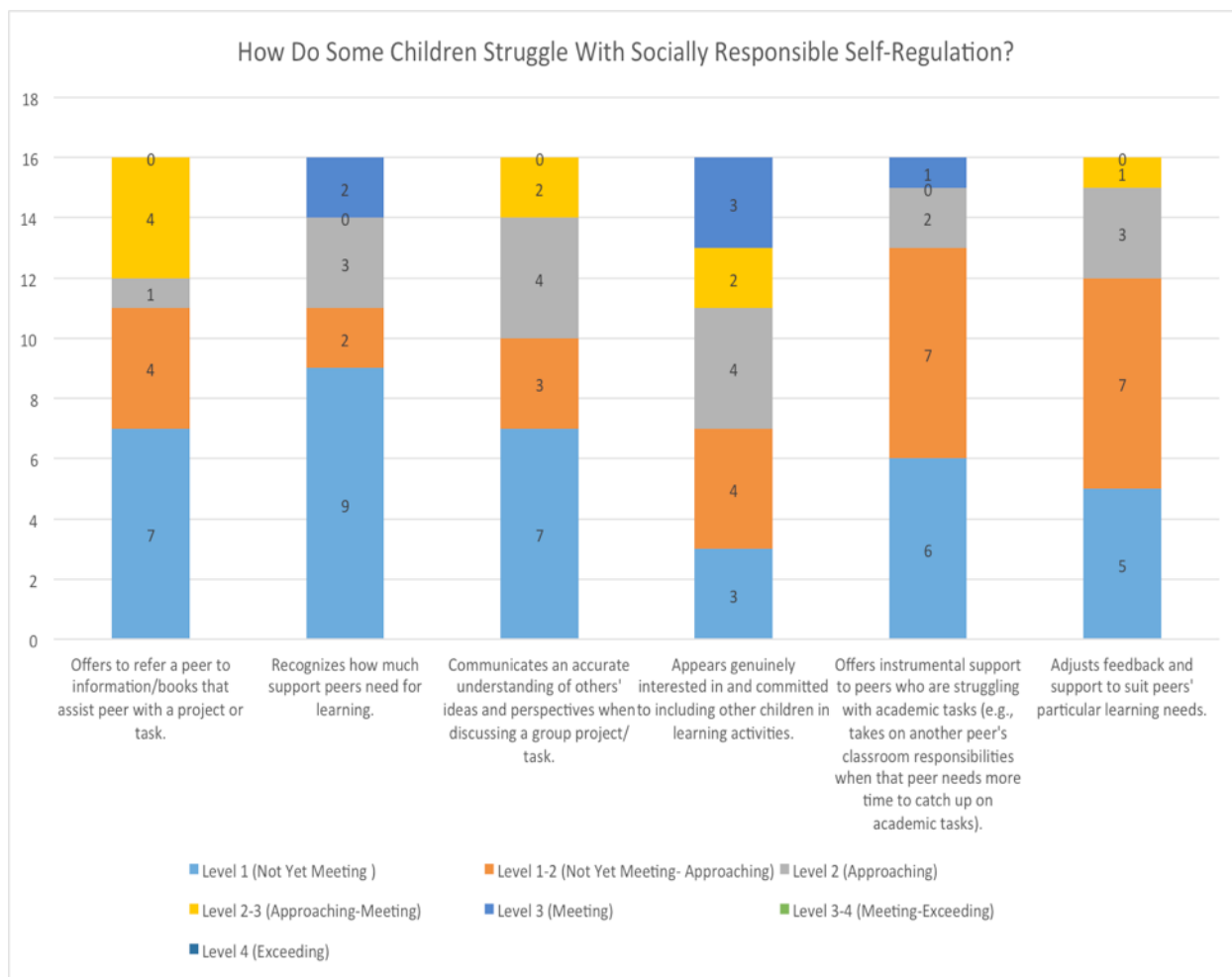


Figure 4. Item analysis for SRSR subscale of SRISI for 'at risk' subsample