

## **Research Self-Efficacy Among Students: Role of Metacognitive Awareness of Reading Strategies, Research Anxiety, and Attitude Towards Research**

**Umamah Wajid and Humaira Jami**

Quaid-i-Azam University

The present study aimed to explore the role of metacognitive awareness of reading strategies, research anxiety, and attitude towards research in research self-efficacy among students at university currently conducting research as part of their degree requirement. The role of perceived supervisor's satisfaction from research and intensity of reading as moderators was also analyzed. Research Self-Efficacy Scale (Rezaei & Zamani-Miandashti, 2013), Metacognitive Awareness of Reading Strategies (Mokhtari & Reichard, 2002), Research Anxiety Scale (Rezaei & Zamani-Miandashti, 2013), and Attitude towards Research Scale (Rezaei & Zamani-Miandashti, 2013) were used to collect data from purposively drawn sample of 300 university students who were conducting research as part of their degree requirement. Regression analysis revealed metacognitive awareness of reading strategies to be the strongest predictor of research self-efficacy, with research anxiety and attitude towards research being mediators. Further analysis revealed supervisor's satisfaction for research anxiety and intensity of reading for metacognitive awareness of reading strategies to be significant moderators in effecting research self-efficacy. The study findings have been discussed in detail, alongside the implications of the study as well as suggestions for further research in the area.

*Keywords.* Research, self-efficacy, metacognition, reading, anxiety, attitude

Research in education is a procedure by which people obtain reliable and beneficial material about the education procedure (Ary, Jacobs, Sorensen, & Walker, 2013). Doing research is a vital and

---

Umamah Wajid and Humaira Jami, National Institute of Psychology, Quaid-i-Azam University, Islamabad, Pakistan.

Correspondence concerning this article should be addressed to Umamah Wajid, National Institute of Psychology, Quaid-i-Azam University, Islamabad, Pakistan. Email: [umamahwajid@gmail.com](mailto:umamahwajid@gmail.com)

mandatory requirement for partial fulfillment of degrees at higher education level in Pakistan. During this phase, some students feel more efficacious in carrying out research study than other. Research self-efficacy has been defined as one's sureness in efficaciously acting tasks related to research procedure, such as carrying out a literature review or studying data (Forester, Kahn, & Hesson-McInnis, 2004). Mullikin, Bakken, and Betz (2007) state that research self-efficacy is the self-assurance one holds in achieving goals relevant to research.

According to Kargar and Zamanian (2014), self-efficacy among students strongly influences their selected methods of learning. This relationship has been found to be strengthened by motivation and willingness to learn among students (Zimmerman, 2000). Kim and Lorschach (2005) discovered that students who experienced high self-efficacy are at a more advanced stage of writing than those experiencing low self-efficacy, thereby highlighting the significance of self-efficacy in various areas of academic performance and development.

Certain skills are found to be associated with successful completion of research related tasks. Process of finding meaning in text, understanding the overall message, and analyzing lengthy pieces of literature on related topics are vital components of research that highlights the significance of reading proficiency. Reading is an acquired skill that evolves and modifies over time and with knowledge. The ability to understand this skill and use it in the most effective and efficient way is facilitated by metacognitive awareness of reading (Alexander & Jetton, 2000).

### **Research Self-Efficacy and Metacognitive Awareness of Reading Strategies**

Metacognition is described as "cognition about cognitive phenomena" (Flavell, 1979). Generally, cognition refers to the knowledge and skills a person possesses, while metacognition involves that person's understanding and awareness of those knowledge and skills (Mahdavi, 2014). Metacognition is what enables students faced with new challenges to identify and try new tactics in order to solve the problem (Kuhn & Dean, 2004).

Metacognitive skills and strategies are a strong indicator of an individual's thoughts and ability, and they assist learning and aid performance development (Ahmadi, Ismail, & Abdullah, 2013). An extensive variety of strategies regarding reading, particularly in terms

of reading comprehension, are required by proficient readers (Paris, Wasik, & Turner, 1991). In the construction of meaning, a reader's consciousness and monitoring of the comprehension process is critical (Ahmadi et al., 2013). Johnston (1983) found that readers make use of conscious, as well as unconscious, strategies to face challenges and find meanings in text while reading. Having confidence in an individual's own learning process and having the ability to make use of various metacognitive reading strategies has been found to be important for students' success in their learning and related courses and activities (Wang, Spencer, Minjie, & Xing, 2009).

Various researches conducted on academics and self-efficacy reveal consistently positive correlations between the two variables. Readers with high self-efficacy tend to use reading strategies more frequently than readers who experience low self-efficacy (Li & Wang, 2010). Self-efficacy has been strongly linked to reading comprehension (Kargar & Zamanian, 2014). A relationship linking self-efficacy with mental effort has been found (Salomon, 1984). According to Schunk (1989), while carrying out work related to learning, students who find it difficult to process new information may come to the conclusion they are less capable and, as a result, may feel less efficacious about performing well or learning. Li and Wang (2010) found that readers with high self-efficacy reported a significantly greater frequency in using reading strategies than those with low self-efficacy. Reading inspiration encourages common reading, which then facilitates and encourages using proper reading tactics and thereby increases self-efficacy (Guthrie, Wigfield, & VonSecker, 2000).

### **Research Self-Efficacy and Research Anxiety**

Research anxiety refers to the features or activities involved in research work which a student notices as uncomfortable, and which influence him or her to the degree that efficiency in working may be lessened (Higgins & Kotrlik, 2006). Academically, research has established strong, negative relations amid different kinds of self-efficacy and anxiety in various settings (Shelton & Mallinckrodt, 1991).

Self-efficacy and metacognitive awareness of reading have been linked with anxiety. Anxiety has been found to be negatively associated with the use of cognitive learning strategies (Cassady & Johnson, 2002). Furthermore, a negative association has also been found between self-efficacy and anxiety (Tahmassian & Moghadam, 2011). Papanastasiou and Zembylas (2008) found that students with

low self-perceptions about completing a task are likely to experience more anxiety. Research conducted in Pakistan has also revealed a significant, negative relationship between self-efficacy and anxiety related to research among university students (Amna, 2016).

Moreover, students who are more anxious often come across as ineffective learners who are essentially unable to apply the cognitive strategies required to meet their learning-related goals (Naveh-Benjamin, McKeachie, Lin, & Holinger, 1981). The influence anxiety has on self-efficacy can be also viewed as facilitated by the physiological states that accompany anxiety, such as quickened heart-pace and sweaty palms (Corkett, Hatt, & Benevides, 2011).

### **Research Self-Efficacy and Attitude Towards Research**

A positive attitude towards research is also an important part of the research process. A positive attitude towards research increases the student's motivation enabling them to complete the tasks with more determination and more efficiency (Baker & Beall, 2009). Students' self-efficacy has been positively related with their attitude towards an assigned task (Bishop & Bieschke, 1998). Corkett, Parila, and Hein (2006) also found a positive relationship between positive attitude towards research and reading strategies, as well as a positive association between a negative attitude towards research and reading-related problems. Furthermore, a negative, significant relationship between having a positive attitude towards research and experiencing research anxiety has been found (Rezaei & Zamani-Miandashti, 2013). The amount of involvement and interest a student has in research is predictive of study self-efficacy (Bieschke, Bishop, & Garcia, 1996). Rezaei and Zamani-Miandashti (2013) also found a significant, positive relationship between research self-efficacy among students and their attitude towards research. Hollingsworth and Fassinger (2002) also found research self-efficacy to be strongly predicted by attitude towards research among pupils.

Since self-efficacy and positive academic output, including achievements and research productivity, are highly correlated, it is important to explore the various factors that influence a student's self-efficacy beliefs in order to encourage productivity and academic excellence. It is important for research students to be high in self-efficacy, motivation, and productivity. From cognitive perspective, cognitions underlie feelings, behavior, and actions. Therefore, in the current study, metacognitive awareness of reading being a cognitive factor is assumed to be a leading predictive factor to reduce research anxiety, and increase positive attitude towards research, hence,

promote research self-efficacy among students. Those students who read more and are aware of their reading strategies are likely to feel more efficacious while doing research for partial fulfillment of their degrees. The role of intensity of reading has been identified as contributing to an increase in self-efficacy within the context of metacognitive awareness of reading strategies. Self-efficacy among students has been found to be most influenced by their perceived fluency in reading, a concept that is inclusive of strategies such as word recognition as well as general reading rate (Henk & Melnick, 2010). In this manner, perceived intensity of reading may be contemplated as having a greater role in influencing self-efficacy than the actual, objective rate of reading, a finding that is relevant to the present study as it is reliant on self-report measures of intensity of reading. Furthermore, a positive relationship has been established between reading fluency and learning-related self-efficacy (Peura et al., 2019). Additionally, Miyamoto, Pfoest, and Artelt (2019) also found significant indirect mediating effects of reading amount on reading comprehension, alongside a link between intensity of reading and metacognitive awareness of strategies.

An important factor to consider regarding students in Pakistan is that research students, in particular, carry the burden of learning and expertly making use of the English language. Due to the variety of education systems in Pakistan, a uniform basic understanding of English does not exist, despite its place as the official language of the country. The basic education systems vary from being either English or Urdu medium, or, in many cases, are replaced with religious school systems (*madrassah*) altogether. However, it is deemed necessary for research-related papers, articles and reports to be written and published in English. It is therefore vital for Pakistani students to not only learn English efficaciously but also to be aware of their own cognitive reading skills. Students who are able to grasp reading strategies and enhance metacognitive awareness of such skills may then perform better in learning and research related tasks, despite carrying them out in a second language. The present study thus aims to explore the role of metacognitive awareness of reading strategies in regards to the research process, which has not previously been studied in Pakistan.

Another important aspect of research is the research student's own emotional perception of the process of research. Higher intensity of anxiety may lead to burnout amongst research students, which may result in waste of resources such as time, energy, and effort and sometimes dropping out of the research as a course. During process of doing research, role of supervisor is found to be very significant.

Amna (2016) found in Pakistan that where research students perceive good and positive supervisory support, they are able to tackle their research related anxieties efficiently and feel efficacious in doing research related tasks. A study conducted on doctoral students found that students perceive a positive role of supervisor as crucial for their psychological well-being during the research process (Ahmed, Umrani, Pahi, & Shah, 2017). They further emphasized that support from supervisors can help raise self-efficacy among students, thereby making them feel more capable. Additionally, Liu et al. (2019) found a mediating relationship of supervisor interactions between research self-efficacy and distress. Levels of academic support from supervisors have also been found to be associated with greater research self-efficacy (Overall, Deane, & Peterson, 2011). The role of supervisor in determining research anxiety was further explored by Blanchard and Haccoun (2019) who found that when supervisor support levels are low, students are likely to experience negative outcomes, including psychological distress and even withdrawal from the research project altogether.

Therefore, it is important to explore the factors like perceived supervisor's satisfaction from the pace of research among students that may reduce or increase impact of research anxiety on research self-efficacy.

With consideration of the aforementioned literature, the objective of this research is to explore the role of metacognitive awareness of reading strategies, research anxiety, and attitude towards research in research self-efficacy among research students. Following are the assumptions

### **Hypotheses**

1. Metacognitive awareness of reading strategies positively predicts research self-efficacy among research students.
2. Increased research anxiety reduces self-efficacy in context of less metacognitive awareness of reading strategies among research students.
3. Positive attitude towards research increases self-efficacy in context of increased metacognitive awareness of reading strategies among research students.
4. Supervisor's dissatisfaction from pace of research reduces research self-efficacy with increase in research anxiety.
5. Those who read more have more research self-efficacy with increased metacognitive awareness of reading strategies.

## Method

### Participants

The purposive sample comprised of 300 research students with age range of 20-37 years ( $M = 24.0$ ,  $SD = 3.31$ ) from 113 private (37.7%) and 166 public (55.3%) universities and colleges of Islamabad and Rawalpindi. The inclusion criterion of the sample was that the participants had to be carrying out independent research, lasting at least one semester as a requirement for their degree. Students with a current education level of below 16 years were excluded from the sample. Sample included 114 (38%) male and 186 (62%) female students. The students were from varying disciplines that is Social Sciences 57 (19%), Natural Sciences 45 (15%), Management Sciences 128 (42.7%), and Linguistics 49 (16.3%), while 21 (7%) did not report their discipline. The sample included participants studying at various levels of current education, including 116 (38.7%) graduate and Masters, 149 (49.7%) MS/MPhil, and 35 (11.7%) PhD students.

### Measures

**Research Self-Efficacy Scale (RSES).** Research self-efficacy was assessed by RSES (Rezai & Zamani-Miandashti, 2013). This scale consisted of 18 items rated on a 5-point likert-type scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*) (Büyüköztürk, Atalay, Sozgun, & Kebapçı, 2011). The scale used was updated by Rezai and Zamani-Miandashti (2013). There was no reverse scoring. High scores represented high research self-efficacy of students. The reported alpha coefficient and split-half reliability coefficient of the scale was .87 and .85, respectively (Büyüköztürk et al., 2011). Reliability analysis revealed alpha co-efficient of .89 for RSES in current study.

**Metacognitive Awareness of Reading Strategies Inventory (MARSİ).** MARSİ (Mokhtari & Reichard, 2002) was used to determine the metacognitive awareness of reading strategies of the students. This scale consisted of 30 items that are rated a 5-point likert-type scale ranging from 1 (*I Never Do This*) to 5 (*I Always Do This*). There was no reverse scoring. High scores on MARSİ represented high metacognitive awareness. The reliability was reported to be .89 (Mokhtari & Reichard, 2002). The MARSİ had three subscales: Global Reading Strategies (13 items), Problem Solving Strategies (8

items), and Support Reading Strategies (9 items). Reliability analysis revealed alpha co-efficient of .89 for MARSIS in current study.

**Research Anxiety Scale (RAS).** In order to assess the amount of research anxiety a student experienced, RAS (Rezai & Zamani-Miandashti, 2013) was used. RAS was a modified version of a previous scale developed by Higgins and Kotrlik in 2006. The scale consisted of 15 items rated on a 5-point likert-type scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Five items were reverse scoring. High score on this scale indicated high levels of research anxiety. Reliability analysis revealed alpha co-efficient of .82 for RAS in the current study.

**Attitude Towards Research Scale (ATRS).** To determine the attitude a student holds towards research, a 12 item ATRS (Rezai & Zamani-Miandashti, 2013) was employed. This scale was rated on a 5-point likert-type scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Two items were reverse coded. A high score on this scale indicated a positive attitude towards research. Reliability analysis revealed alpha co-efficient of .76 for ATRS in the current study.

**Demographic Sheet.** A demographic sheet, consisting of demographic details relating to the participant such as age, gender, education, and discipline, was also used. The sheet also contained items regarding reading and research-related questions. The research-related questions helped establish what stage of research each participant was at and his or her perceived level of supervisor satisfaction. The reading related questions explored the reading habits of the sample, such as the number of books read in a year, how often they read different sources of information, whether they read without obligation or compulsion, and the subjects of their online reading. In this study, only supervisor satisfaction and the number of books read in a year were used in analysis as per research objectives.

## Procedure

Sample was approached through convenient sampling. The survey method was used, administering questionnaires for the purpose of data collection. The participants were asked to sign the consent form before filling out the questionnaires, which assured them of confidentiality and anonymity granted. Objectives of the study were shared with participants and they were given right to withdraw if they did not feel comfortable in process of filling the booklet of questionnaires without any repercussion. The form also requested



honest and accurate responses once they volunteer to take up the task. They were acknowledged of their voluntary participation in the research study after completing the booklet. Data was analyzed using Statistical Package for Social Sciences (SPSS 24.0 for Windows) for a quantitative analysis.

## Results

Descriptive statistics were computed in order to check for normality of the data. To find the relationship between metacognitive awareness of reading, research self-efficacy, research anxiety and attitude towards research, correlation coefficients were computed. Step-wise regression was applied to explore the hierarchical prediction of research self-efficacy. For moderation and mediation, regression was run through Process.

Normal distribution of the data was confirmed through checking skewness and kurtosis. Values of skewness and kurtosis for Research Self-Efficacy Scale (skewness = -.43, kurtosis = -.10), Metacognitive Awareness of Reading Strategies Inventory (skewness = .08, kurtosis = -.51), Research Anxiety Scale (skewness = -.28, kurtosis = -.68), and Attitude towards Research Scale (skewness = -.53, kurtosis = -.14) lies between +1 and -1 and data is normally distributed suggesting use of parametric tests for analysis further.

Pearson Product Moment Correlation analysis was conducted in order to explore the significance and direction of relationships between variables.

Table 1  
*Correlation Between Study Variables (N = 300)*

Variables	1	2	3	4
1 Research self-efficacy	-	.55**	-.39**	.47**
2 Metacognitive awareness of reading Strategies		-	-.25**	.34**
3 Research anxiety			-	-.13*
4 Attitude towards research.				-

\*  $p < .05$ ; \*\*  $p < .01$ .

Table 1 shows that research self-efficacy is significantly positively related to both metacognitive awareness of reading strategies and attitude towards research, while all three negatively correlate with research anxiety.

Mediation analysis was conducted to explore the effect of metacognitive awareness of reading strategies on research self-efficacy through research anxiety and attitude towards research as mediators. Multiple hierarchical regression analysis for mediation analysis was conducted using enter method. Sobel test was also carried out to check significance of mediation.

Table 2

*Mediating Role of Research Anxiety and Attitude Towards Research for Metacognitive Awareness of Reading Strategies in Predicting Research Related Self-Efficacy (N=300)*

Variables	Research Self-Efficacy		
	Model 1	Model 2	Model 3
	$\beta$	$\beta$	$\beta$
Constant	27.66*	46.69*	18.39*
Metacognitive awareness of reading strategies	.33*	.29*	.26*
Research anxiety	-	-.32*	-
Attitude towards research	-	-	.37*
$R^2$	.30	.37	.38
$\Delta R^2$		.07	.08
$F$	128.48*	87.95*	94.26*

\* $p < .001$ .

In Table 2, metacognitive awareness of reading strategies is significant predictor of research self-efficacy with 30% variance in Model 1 with 95% CI [.23, .38]. In Model 2, metacognitive awareness of reading strategies indirectly ( $p < .001$ ) predict research self-efficacy through research anxiety with 7% added variance and 95% CI [-.43, -.21]. This indicates that research anxiety is partial mediator for metacognitive awareness of reading strategies in predicting research self-efficacy, as metacognitive awareness of reading strategies maintains its significance with little reduction in its significance. Findings show that increase in knowledge about one's reading strategies reduce research anxiety that in turn increases self-efficacy in doing research. Metacognitive awareness of reading strategies predicts research self-efficacy through research anxiety ( $z = 3.45, p < .001$ ).

Table 2 further shows in Model 3 that metacognitive awareness of reading strategies and attitude towards research significant are predictors of research self-efficacy with 38% variance in Model 1 with 95% CI [.20, .38]. In Model 3, metacognitive awareness of reading

strategies indirectly ( $p < .001$ ) predict research self-efficacy through attitude towards research with 8% added variance and 95% CI [.26, .48]. This indicates that attitude towards research is a partial mediator for metacognitive awareness of reading strategies in predicting research self-efficacy, as metacognitive awareness of reading strategies maintains its significance with little reduction in its significance. Metacognitive awareness of reading strategies predicts research self-efficacy through attitude towards research ( $z = 4.50$ ,  $p < .001$ ). Upon the basis of the mediation findings, the model explaining predicting for research related self-efficacy is presented in Figure 1.

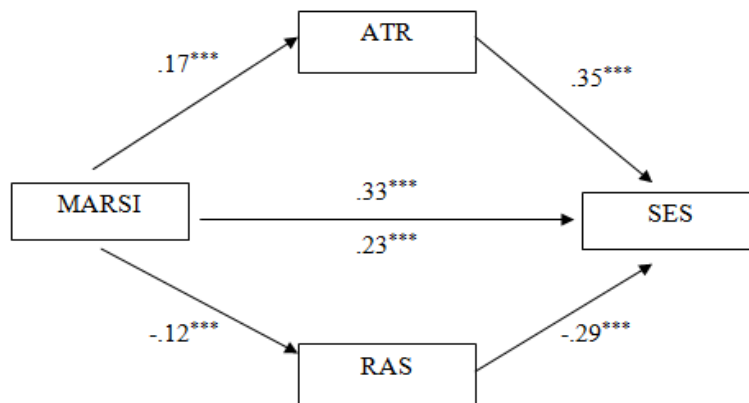


Figure 1. Model explaining mediating role of research anxiety (RAS) and attitude towards research (ATR) for metacognitive awareness of reading strategies (MARS) in predicting research related self-efficacy (SES).

Regression analysis was performed through Process in SPSS to study moderating role of supervisor’s satisfaction with pace of research work and intensity of reading on various paths of the model. Only significant interaction effects are reported here.

Table 3 shows the moderating role of supervisor’s satisfaction for research anxiety in predicting research self-efficacy during the research process. The main effect of research anxiety is significantly negative in predicting of self-efficacy in doing research, while supervisor’s satisfaction with pace of work is also predicting self-efficacy negatively. Upon addition of 4% variance, the interaction effect is significant indicating that perceived supervisor’s satisfaction during research is moderating the relationship between research anxiety and research related self-efficacy. Further analysis of this relationship can be explored in Figure 2.

Table 3

*Moderation of Supervisor's Satisfaction for Research Anxiety in Predicting Research Self-Efficacy (N = 300)*

Predictors	Research Self-Efficacy			
	B	t	LL	UL
Constant	123.13***	11.03***	101.16	145.10
Research Anxiety	-1.34***	-5.53***	-1.81	-.86
Supervisor Satisfaction	-11.20**	-3.65**	-17.23	-5.17
Research Anxiety x Supervisor Satisfaction	-.25**	-3.76**	.12	.38
R <sup>2</sup>	.19			
ΔR <sup>2</sup>	.04			
F	23.58***			

Note: B = Unstandardized Beta co-efficient; CI = Confidence Interval; LL= Lower Limit; UL = Upper Limit.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Moderation of supervisor's satisfaction for research anxiety in leading to research self-efficacy revealed that low ( $t = -7.62, p < .001$ ) level of perceived supervisor's satisfaction sharply decreased research self-efficacy with increase in research anxiety. For those perceiving high supervisor's satisfaction ( $t = -2.70, p < .01$ ), decrease in self-efficacy will increase in research anxiety is less sharp as compared to the other two groups. This shows that perceived supervisor's increased dissatisfaction from pace of research work sharply decreases research self-efficacy with increase in research anxiety (see Figure 2).

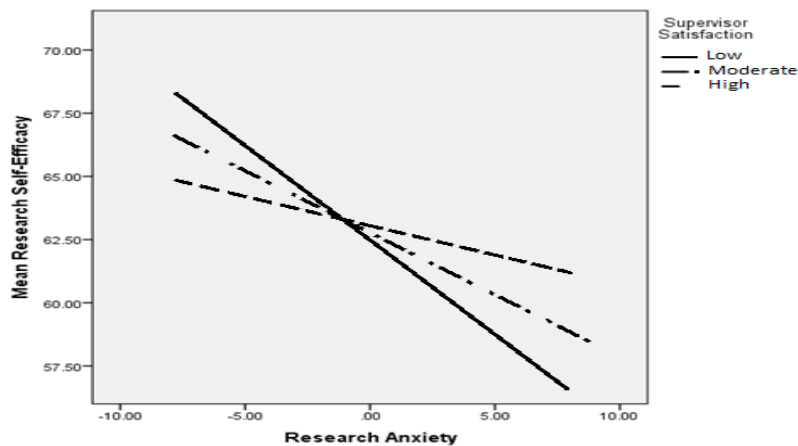


Figure 2. Interaction effect of research anxiety and supervisor satisfaction on research self-efficacy.

Table 4  
*Moderation of Intensity of Reading for Metacognitive Awareness of Reading Strategies in Predicting Research Self-Efficacy (N=300)*

Predictors	<i>B</i>	<i>t</i>	Research Self-Efficacy	
			95% CI	
			<i>LL</i>	<i>UL</i>
Constant	1.63	.14	-21.29	24.55
Metacognitive Awareness	.54 <sup>***</sup>	4.85 <sup>***</sup>	.32	.77
Intensity of Reading	1.75 <sup>*</sup>	2.34 <sup>**</sup>	.28	3.22
Metacognitive Awareness x Intensity of Reading	.01 <sup>*</sup>	1.99 <sup>*</sup>	-.03	-.0002
<i>R</i> <sup>2</sup>	.32			
$\Delta R^2$	.01			
<i>F</i>	47.29 <sup>***</sup>			

Note. *B* = Standardized Beta co-efficient; CI = Confidence Interval; LL= Lower Limit; UL = Upper Limit.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

Table 4 depicts significant main effect of metacognitive awareness of reading strategies upon research self-efficacy, so is for intensity of reading's main effect. Interaction effect of metacognitive awareness of reading strategies with intensity of reading added to the variance 1% with significance ( $p < .05$ ). This indicates significant role of intensity of reading during the research process with metacognitive awareness of reading strategies in predicting research self-efficacy among research students. This relationship is further explored in Figure 3. This reveals that students with low metacognitive awareness of reading strategies also experience the lowest amount of research self-efficacy significantly more among students who read less ( $t = 11.36, p < .001$ ) and with moderate level of reading ( $t = 9.53, p < .001$ ) than those students with more reading ( $t = 6.76, p < .001$ ). Increase in metacognitive awareness of reading strategies also likely to increase research-related self-efficacy for all students, however, more pronounced for those students who read more. Metacognitive awareness is a protective factor and even those who read less also feel efficacy if they become aware of the reading strategies (see Figure 3).

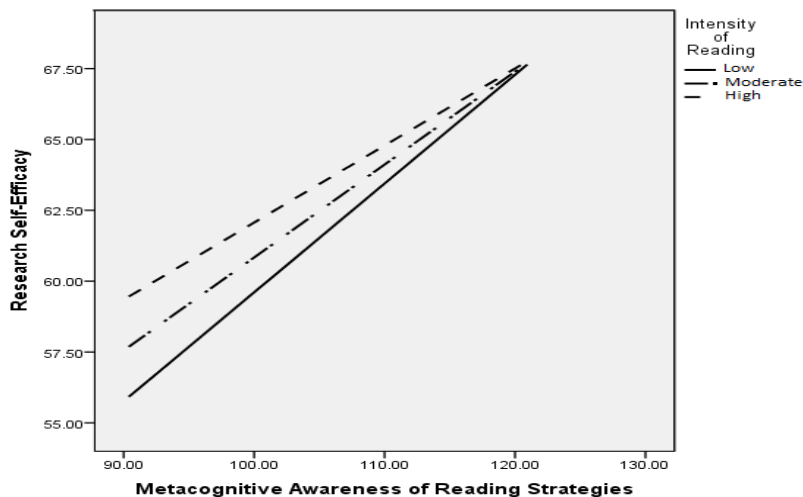


Figure 3. Interaction effect of metacognitive awareness of reading strategies with intensity of reading on research self-efficacy.

## Discussion

The objective of the study was to explore the role of metacognitive awareness of reading strategies, research anxiety, and attitude towards research in predicting research self-efficacy among research students. Findings supported the first hypothesis stating a positive predictive relationship between metacognitive awareness of reading strategies and research self-efficacy, so that high metacognitive awareness of reading strategies is linked to high levels of research self-efficacy. Previous researches (Boakye, 2015; Kargar & Zamanian, 2014; Li & Wang, 2010; Wang et al., 2009) have been found to support this finding, thereby positively linking metacognitive awareness of reading strategies to research self-efficacy with 30% variance caused by metacognitive awareness of reading strategies in Model 1 of mediation analysis. Even this metacognitive skill about one's awareness of reading strategies to be employed at a given time maintains its significance in the presence of mediators, research anxiety and attitude towards research.

This may be because research activity is very sophisticated and demands exhaustive analysis of literature to build arguments and justify assumptions when number of plausible explanations is

available for any one assumed relationship. This seems to be daunting and haunting experience for research students if they feel less skillful in reading and making best use of literature to build up their thesis. Report writing, designing research, and doing analysis involves in-depth study of some research material, analysis techniques, and statistical methods, while just scanning or using eyeball method for other. Metacognitive skills and strategies are a strong indicator of an individual's thoughts and ability, and assist learning and aid performance development (Ahmadi et al., 2013). In the context of doing research, metacognitive skill about knowing which reading strategies is helpful at given point of time helps in increasing one's feeling of self-competence in accomplishing research related tasks.

The current research further revealed a negative relationship between metacognitive awareness of reading strategies and research anxiety, thereby validating previous studies (Chansky, 1958; Merryman, 1974; Naveh-Benjamin et al., 1981; Stallworth-Clark, Cochran, Nolen, Tuggle, & Scott, 2000). Thus, good knowledge of how one employs reading strategies while gathering information from different sources is linked to low levels of research anxiety with  $\beta = -.12$ ,  $p < .001$ . Mediation analysis confirms Hypothesis 2 about mediating role of research anxiety for metacognitive awareness of reading strategies in predicting feeling of self-competence in accomplishing research related tasks. Cognitive learning strategies reduce anxiety (Cassady & Johnson, 2002), which promotes feeling of self-efficacy (Tahmassian & Moghadam, 2011). If a research student is skillful and aware of reading strategies to be employed during research process from conceptualization to report writing, it helps in reducing their level of discomfort and apprehensions in doing research, hence, increase their confidence about themselves in completing research related tasks in time. Previous literature (Cassady & Johnson, 2002; Collins, Onwuegbuzie, & Jiao, 2006; Corkett et al., 2011; Derakshan & Eysenck, 2009; Tahmassian & Moghadam, 2011) also showed links between these variables. Thus, high levels of research anxiety reduce research self-efficacy in the context of less metacognitive awareness of reading strategies.

Findings of the study confirm the literature that there is positive relationship between metacognitive awareness of reading strategies and positive attitude towards research (Baker & Beall, 2009; Paris & Winograd, 1990; Turkyilmaz, 2015). Having knowledge of reading strategies is a skill that helps student to manage and improve information gathering relevant to one's research, hence, makes the attitude towards research more positive. The significant predictive role of metacognitive awareness is also obvious in mediation analysis with

$\beta = .17, p < .001$ . Mediation analysis confirms Hypothesis 3 about mediating role of attitude towards research for metacognitive awareness of reading strategies in predicting feeling of self-competence in accomplishing research related tasks. Thinking and belief system underlies one's judgments, opinion, feelings, and actions as per cognitive perspective. Metacognition is cognition about cognition. Awareness of cognitive skills related to reading promotes positive attitude about doing research that generates feeling of competence among research students. Positive attitude towards research increases the student's motivation to complete the tasks with grit and efficiency (Baker & Beall, 2009). The amount of involvement and interest a student has in research is predictive of self-efficacy (Bieschke, Bishop, & Garcia, 1996). Hence, a positive attitude towards research has been found to increase research self-efficacy in the context of more metacognitive awareness of reading strategies. This finding can be supported by establishment of these relationships in previous research (Kargar & Zamanian, 2014; Papanastasiou, 2005; Polychroni, Koukoura, & Anagnostou, 2006; Rezaei & Zamani-Miandashti, 2013).

Results of moderation analysis for supervisor's satisfaction between research anxiety and research self-efficacy revealed that supervisor's dissatisfaction sharply reduced research related self-efficacy with an increase in research anxiety, thereby highlighting the importance of supervisor's satisfaction during the research process. This finding is supported by evidence in previous researches (Jiang & Klein, 1999; Noels, Clément, & Pelletier, 1999); thereby confirming that perceived supervisor satisfaction plays an important role in contributing to self-efficacy among research students. Students experience anxiety while doing research, as it is a unique experience that demands originality and deviation from customary methods of learning and evaluation employed in other courses taught by teacher. Student takes up research under close supervision of a mentor. Mental compatibility and compassion within this one-to-one relationship is a tricky task. During this phase, under the guidance of trained supervisor, student needs to be independent in learning, self-sufficient in exploring available resources, regular in meeting academic deadlines, proficient in reading and writing to accomplish research related tasks. Increased level of anxiety challenges self-efficacy during this phase. At the same time, in the midst of doing research, if student perceives the dissatisfaction of the supervisor about pace of the research, it sharply reduces the feelings of self-efficacy in student. This shows that role of supervisor is very significant to student's personal feeling of self-efficacy in completing research. Supervisor



support has been found to positively correlate with sense of belonging and high academic self-concept (Curtin, Stewart, & Ostrove, 2013). Bazrafkan, Shokrpour, Yousefi, and Yamani (2016) found that the graduate students' relationship with their thesis supervisors is a significant factor in their level of anxiety regarding their research; supervisors who played nonresponsive, ineffective and negative roles were found to contribute to higher levels of fatigue and both physical and emotional distress. Various studies have also identified difficulties in relationships with supervisors as a significant stressor for research students (Russell-Pinson & Harris, 2017; Wang & Li, 2011) that reduced research self-efficacy in current study.

Moderation analysis for intensity of reading between metacognitive awareness of reading strategies and research self-efficacy showed that better metacognitive awareness of reading strategies lead to high research self-efficacy among students who read a lot as compare to those who read less. It is so because those who read more along with applying metacognitive awareness experienced better research self-efficacy. These findings are supported by literature (Chansky, 1958; Jay & Wu, 2001; Kargar & Zamanian, 2014; Neville, Pfost, & Dobbs, 1967). This emphasizes the significance of reading in promoting self-efficacy in doing research. Impact of metacognitive awareness of reading strategies get enhanced with more reading during research process in promoting self-efficacy among research students. Those who are aware of reading strategies to be employed in a given phase of research when read from different sources too, they have feeling of competence in completing research related tasks.

### **Limitations and Recommendations**

One of the limitations of the current study is that it did not take an equal balance of male and female research students, as female research students proved to be a more accessible sample in comparison to male research students. In order for more insight into gender influence and differences in this area of research, future studies may take into consideration a balanced ratio in regards to the gender of the participants. Another limitation is that the present research was a cross-sectional study that could not explore changes in the research students' self-efficacy over time. For future researches, longitudinal studies relating the study variables should be conducted for further exploration. Furthermore, while the current study included the amount of supervisor satisfaction as perceived by student as a moderating variable. The actual role of the supervisor is essential to the research process and, therefore, it is recommended to consider the supervisor's

actual satisfaction in the future studies by approaching research supervisors themselves for their rating. Furthermore, several complaints regarding the length of the questionnaires were received. For future researches, perhaps shorter and more concise measures should be used. In addition, the sample was of a limited number and, hence, could not be generalized. Beside this, the participants were approached through convenient sampling within a restricted area. For future studies, larger data from other regions and random sampling can be taken up in order to gain more generalizable and internally valid results.

### **Implications**

The study most importantly revealed the importance of metacognitive awareness of reading strategies during the research process in enhancing research-related self-efficacy. Therefore, academic institutions may facilitate research self-efficacy by focusing at increasing students' awareness about reading strategies based upon problem solving and support driven to achieve research related goals that is reviewing literature, designing research, developing research tools, doing analysis, and report writing; each demanding different reading strategies. Results indicated that attitude towards research and research anxiety is mediating factors for metacognitive awareness of reading strategies in leading toward research self-efficacy. Thus, methods to enhance a positive attitude towards research and reduce research anxiety can be implemented, in order to increase research-related self-efficacy in the presence of metacognitive awareness of reading strategies. The study also highlighted the role of the supervisor in increasing or decreasing self-efficacy among research students. Proper training of supervisors may help to promote better relationships with the students. Better relationships would allow for transference of knowledge in a way that reduces anxiety in students and promote self-efficacy. Additionally, results revealed the influence that reading habits can have on research self-efficacy. Encouraging an increase in reading habits may help bring a positive impact in metacognitive awareness of reading strategies, attitude towards research and research self-efficacy, while reducing research related anxiety. Hence, reading culture needs to be promoted in educational system for giving rise to research in promoting scientific knowledge.

### **Conclusion**

The findings of the study helps to conclude that metacognitive awareness of reading strategies hold significance in promoting

research self-efficacy among students, while, research anxiety reduces and positive attitude towards research increase feeling of competence driven by one's awareness of reading strategies to be used for best possible outcome in research. Supervisor's dissatisfaction with the pace of research acts as moderator whereby anxiety reduces self-efficacy. Intensity of reading with metacognitive awareness of reading strategies enhances self-efficacy while doing research.

### References

- Ahmed, U., Umrani, W. A., Pahi, M. H., & Shah, S. M. M. (2017). Engaging PhD students: Investigating the role of supervisor support and psychological capital in a mediated model. *Iranian Journal of Management Sciences, 10*(2), 283-306.
- Ahmadi, M. R., Ismail, H. N., & Abdullah, M. K. K. (2013). The importance of metacognitive reading strategy awareness in reading comprehension. *English Language Teaching, 6*(10), 235. Retrieved from <http://dx.doi.org/10.5539/elt.v6n10p235>
- Alexander, P. A., & Jetton, T. L. (2000). Learning from text: A multidimensional and developmental perspective. *The Handbook of Reading Research, 3*, 285-310.
- Amna, B. (2016). *Burnout among research students: Role of research related social comparison, efficacy, anxiety, and self-criticism* (Unpublished MPhil dissertation). National Institute of Psychology, Quaid-i-Azam University, Islamabad, Pakistan.
- Ary, D., Jacobs, L. C., Sorensen, C. K., & Walker, D. (2013). *Introduction to research in education*. Boston, MA: Cengage Learning.
- Baker, L., & Beall, L. C. (2009). Metacognitive processes and reading comprehension. *Handbook of Research on Reading Comprehension, 2*, 373-388.
- Bazrafkan, L., Shokrpour, N., Yousefi, A., & Yamani, N. (2016). Management of stress and anxiety among PhD students during thesis writing: A qualitative study. *The Health Care Manager, 35*(3), 231-240.
- Bieschke, K. J., Bishop, R. M., & Garcia, V. L. (1996). The utility of the research self-efficacy scale. *Journal of Career Assessment, 4*(1), 59-75.
- Bishop, R. M., & Bieschke, K. J. (1998). Applying social cognitive theory to interest in research among counseling psychology doctoral students: A path analysis. *Journal of Counseling Psychology, 45*(2), 182-199.
- Blanchard, C., & Haccoun, R. R. (2019). Investigating the impact of advisor support on the perceptions of graduate students. *Teaching in Higher Education, 2*(1), 1-18.

- Boakye, N. A. (2015). The relationship between self-efficacy and reading proficiency of first-year students: An exploratory study. *Reading & Writing-Journal of the Reading Association of South Africa*, 6(1), 1-9.
- Büyükoztürk, S., Atalay, K., Sozgun, Z., & Kebapçı, S. (2011). The development of research self-efficacy scale. *Cypriot Journal of Educational Sciences*, 6(1), 22-29.
- Cassady, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary Educational Psychology*, 27(2), 270-295.
- Chansky, N. M. (1958). Threat, anxiety, and reading behavior. *The Journal of Educational Research*, 51(5), 333-340.
- Collins, K. M., Onwuegbuzie, A. J., & Jiao, Q. G. (2006). Prevalence of mixed-methods sampling designs in social science research. *Evaluation & Research in Education*, 19(2), 83-101.
- Corkett, J. K., Hatt, B., & Benevides, T. (2011). Student and teacher self-efficacy and the connection to reading and writing. *Canadian Journal of Education*, 34(1), 65-98.
- Corkett, J. K., Parrila, R., & Hein, S. F. (2006). Learning and study strategies of university students who report a significant history of reading difficulties. *Developmental Disabilities Bulletin*, 34(1), 57-79.
- Curtin, N., Stewart, A. J., & Ostrove, J. M. (2013). Fostering academic self-concept: Advisor support and sense of belonging among international and domestic graduate students. *American Educational Research Journal*, 50(1), 108-137.
- Derakshan, N., & Eysenck, M. W. (2009). Anxiety, processing efficiency, and cognitive performance: New developments from attentional control theory. *European Psychologist*, 14(2), 168-176.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906.
- Forester, M., Kahn, J. H., & Hesson-McInnis, M. S. (2004). Factor structures of three measures of research self-efficacy. *Journal of Career Assessment*, 12(1), 3-16.
- Guthrie, J. T., Wigfield, A., & VonSecker, C. (2000). Effects of integrated instruction on motivation and strategy use in reading. *Journal of Educational Psychology*, 92(2), 331.
- Henk, W. A., & Melnick, S. A. (2010). Upper elementary-aged children's reported perceptions about good readers: A self-efficacy influenced update in transitional literacy contexts. *Reading Research and Instruction*, 38(1), 57-80.
- Higgins, C., & Kotrlík, J. (2006). Factors associated with research anxiety of university human resource education faculty. *Career and Technical Education Research*, 31(3), 175-199.

- Hollingsworth, M. A., & Fassinger, R. E. (2002). The role of faculty mentors in the research training of counseling psychology doctoral students. *Journal of Counseling Psychology, 49*(3), 324-347.
- Jay, S., & Wu, S. Y. C. (2001). *How the amount of time spent on independent reading affects reading achievement: A response to the National Reading Panel* (Unpublished dissertation). Department of Educational Psychology, University of Minnesota, Minneapolis, USA.
- Jiang, J. J., & Klein, G. (1999). Supervisor support and career anchor impact on the career satisfaction of the entry-level information systems professional. *Journal of Management Information Systems, 16*(3), 219-240.
- Johnston, P. H. (1983). *Reading comprehension assessment: A cognitive basis*. New Jersey, USA: International Reading Association.
- Kargar, M., & Zamanian, M. (2014). The relationship between self-efficacy and reading comprehension strategies used by Iranian male and female EFL learners. *International Journal of Language Learning and Applied Linguistics World, 7*(2), 313-325.
- Kim, J. A., & Lorschbach, A. W. (2005). Writing self-efficacy in young children: Issues for the early grades environment. *Learning Environments Research, 8*(2), 157-175.
- Kuhn, D., & Dean, Jr, D. (2004). Metacognition: A bridge between cognitive psychology and educational practice. *Theory into Practice, 43*(4), 268-273.
- Li, Y., & Wang, C. (2010). An empirical study of reading self-efficacy and the use of reading strategies in the Chinese EFL context. *Asian EFL Journal, 12*(2), 144-162.
- Liu, C., Wang, L., Qi, R., Wang, W., Jia, S., Shang, D., Shao, Y., Yu, M., Zhu, X., Yan, S., Chang, Q., & Zhao, Y. (2019). Prevalence and associated factors of depression and anxiety among doctoral students: The mediating effect of mentoring relationships on the association between research self-efficacy and depression/anxiety. *Psychology Research and Behavior Management, 12*(1), 195-208.
- Mahdavi, M. (2014). An overview: Metacognition in education. *International Journal of Multidisciplinary and Current Research, 2*(3), 529-535.
- Merryman, E. P. (1974). The effects of manifest anxiety on the reading achievement of fifth grade students. *The Journal of Experimental Education, 42*(3), 36-41.
- Miyamoto, A., Pfost, M., & Artelt, C. (2019). The relationship between intrinsic motivation and reading comprehension: Mediating effects of reading amount and metacognitive knowledge of strategy use. *Scientific Studies of Reading, 23*(6), 445-460.
- Mokhtari, K., & Reichard, C. A. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology, 94*(2), 249-261.

- Mullikin, E. A., Bakken, L. L., & Betz, N. E. (2007). Assessing research self-efficacy in physician-scientists: the clinical research appraisal inventory. *Journal of Career Assessment, 15*(3), 367-387.
- Naveh-Benjamin, M., McKeachie, W. J., Lin, Y. G., & Holinger, D. P. (1981). Test anxiety: Deficits in information processing. *Journal of Educational Psychology, 73*(6), 816-829.
- Neville, D., Pfof, P., & Dobbs, V. (1967). The relationship between test anxiety and silent reading gain. *American Educational Research Journal, 4*(1), 45-50.
- Noels, K. A., Clément, R., & Pelletier, L. G. (1999). Perceptions of teachers' communicative style and students' intrinsic and extrinsic motivation. *The Modern Language Journal, 83*(1), 23-34.
- Overall, N. C., Deane, K. L., & Peterson, E. R. (2011). Promoting doctoral students' research self-efficacy: Combining academic guidance with autonomy support. *Higher Education Research & Development, 30*(6), 791-805.
- Papanastasiou, E. C. (2005). Factor structure of the attitudes toward research scale. *Statistics Education Research Journal, 4*(1), 16-26.
- Papanastasiou, E. C., & Zembylas, M. (2008). Anxiety in undergraduate research methods courses: Its nature and implications. *International Journal of Research & Method in Education, 31*(2), 155-167.
- Paris, S. G., & Winograd, P. (1990). How metacognition can promote academic learning and instruction. *Dimensions of Thinking and Cognitive Instruction, 1*, 15-51.
- Paris, S., Wasik, B. A., & Turner, J. C. (1991). The development of strategic readers. In R. Barr, M. L. Kamil, P. B. Mosenthal, & D. Pearson (Eds.), *Handbook of reading research* (vol. 2, pp. 609-640). Mahwah, NJ: Lawrence Erlbaum.
- Peura, P., Aro, T., Viholainen, H., Räikkönen, E., Usher, E. L., Sorvo, R., & Aro, M. (2019). Reading self-efficacy and reading fluency development among primary school children: Does specificity of self-efficacy matter? *Learning and Individual Differences, 73*(1), 67-78.
- Polychroni, F., Koukoura, K., & Anagnostou, I. (2006). Academic self-concept, reading attitudes, and approaches to learning of children with dyslexia: Do they differ from their peers? *European Journal of Special Needs Education, 21*(4), 415-430.
- Rezaei, M. & Zamani-Miandashti, N. (2013). The relationship between research self-efficacy, research anxiety and attitude toward research: A study of agricultural graduate students. *Journal of Educational and Instructional Studies in the World, 3*(4), 69-78.
- Russell-Pinson, L., & Harris, M. L. (2017). Anguish and anxiety, stress and strain: Attending to writers' stress in the dissertation process. *Journal of Second Language Writing, 43*(1), 63-71.

- Salomon, G. (1984). Television is easy and print is tough: The differential investment of mental effort in learning as a function of perceptions and attributions. *Journal of Education Psychology*, 76 (3), 647-658.
- Schunk, D. H. (1989). Self-efficacy and achievement behaviors. *Educational Psychology Review*, 1(3), 173-208.
- Shelton, D. M., & Mallinckrodt, B. (1991). Test anxiety, locus of control, and self-efficacy as predictors of treatment preference. *College Student Journal*, 25(4), 544-551.
- Stallworth-Clark, R., Cochran, J., Nolen, M. T., Tuggle, D. L., & Scott, J. S. (2000). Test anxiety and performance on reading competency tests. *Research and Teaching in Developmental Education*, 17(1), 39-47.
- Tahmassian, K., & Moghadam, N. J. (2011). Relationship between self-efficacy and symptoms of anxiety, depression, worry and social avoidance in a normal sample of students. *Iranian Journal of Psychiatry and Behavioral Sciences*, 5(2), 91-102.
- Turkyilmaz, M. (2015). The relationship between reading attitude, metacognitive awareness of reading strategies, personality and self-regulation: A study of modeling. *Education*, 136(1), 11-18.
- Wang, T., & Li, L. Y. (2011). „Tell me what to do“ vs. „guide me through it“: Feedback experiences of international doctoral students. *Active Learning in Higher Education*, 12(2), 101-112.
- Wang, J., Spencer, K., Minjie, & Xing, M. (2009). Metacognitive beliefs and strategies in learning Chinese as a foreign language. *System*, 37(1), 46-56.
- Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology*, 25(1), 82-91.

Received 21<sup>st</sup> January, 2019

Revision received 15<sup>th</sup> June, 2020