# `HIGH-PERFORMING ESL READERS' RESPONSE TO LOADING COGNITIVE STRESS IN READING COMPREHENSION PERFORMANCE

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by

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| | |
|---|---|
| APB | Akademi Pengajian Bahasa (Academy of Language Studies) |
| AC110 | Diploma in Accountancy |
| AC120 | Diploma in Accounting Information System |
| ANOVA | Analysis of variance |
| AP120 | Diploma in Geomatic Science |
| AP121 | Diploma in Geomatic Science (Geographical Information System) |
| AP122 | Diploma in Geomatic Science (Natural Resources) |
| AS113 | Diploma in Polymer Technology |
| AS115 | Diploma in Industrial Chemistry |
| AS120 | Diploma in Science |
| AT110 | Diploma in Planting Industry Management |
| BM111 | Diploma in Business Studies |
| BM112 | Diploma in Banking |
| BM114 | Diploma in Investment Analysis |
| CC Reader Model | Capacity Constrained Reader Model |
| CS110 | Diploma in Computer Science |
| CS113 | Diploma in Quantitative Science |
| $D_1$ | Text difficulty  level1 |
| $D_2$ | Text difficulty level 2 |
| $D_3$ | Text difficulty level 3 |
| DF | Degree of freedom |
| EAP | English for academic purposes |

| | |
|---|---|
| EFL | English as a foreign language |
| ESL | English as second language |
| Glob | Global reading strategy |
| HPR | High-performing ESL readers |
| IPIP | International Personality Item Pool |
| KR20 | Kuder-Richardson Formula 20 |
| L2 | Second Language |
| MCQ | Multiple choice questions |
| MOE | Ministry of Education |
| MS-Word | Microsoft word |
| MUET | Malaysian University English Test |
| Prob | Problem-solving reading strategy |
| Sig | Significant |
| SMOG | Simple measure of Gobbledygook |
| Sup | Support reading strategy |
| SR113 | Diploma in Sport Studies |
| Std Error | Standard error |
| $T_1$ | Time on Task Level 1 |
| $T_2$ | Time on Task Level 2 |
| $T_3$ | Time on Task Level 3 |
| Ti | Stress test 1 |
| Tii | Stress test 2 |
| Tiii | Stress test 3 |
| Tiv | Stress test 4 |
| Tv | Stress test 5 |

| | |
|---|---|
| Tvi | Stress test 6 |
| Tvii | Stress test 7 |
| Tviii | Stress test 8 |
| Tix | Stress test 9 |
| TOEFL | Test of English as a foreign language |
| TOEFL ® iBT | Test of English as a foreign language internet based test |
| UiTM | Universiti Teknlogi Mara |
| UiTM Perlis | Universiti Teknologi Mara Perlis Campus |

# LIST OF PUBLICATION

1. Mohamad Fadhili Yahaya, Abdul Rashid Mohamed & Syaik Abdul Malik Mohamed Ismail (2012). The relationship between personality traits and reading proficiency. Behavioral, Cognitive & Psychological Sciences III, 53, 36-40.

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# RESPONS PEMBACA *ESL* BERPRESTASI TINGGI TERHADAP BEBAN TEKANAN KOGNITIF DALAM PRESTASI PEMAHAMAN BACAAN

## ABSTRAK

Tujuan utama kajian tentang respons pembaca Bahasa Inggeris sebagai bahasa kedua (*ESL)* yang berprestasi tinggi terhadap beban tekanan kognitif dalam prestasi pemahaman bacaan adalah bagi mengetahui tahap sebenar pembaca yang baik. Kajian ini berasaskan teori transaksi tekanan Lazarus dan Folkman. Oleh itu, kajian ini memberi tumpuan kepada mengenalpasti pembaca *ESL* berprestasi tinggi, menyelidik kesan tekanan kognitif masa untuk bacaan dan kesukaran teks, serta menghuraikan strategi yang digunakan. Memandangkan subjek utama kajian adalah pembaca *ESL* berprestasi tinggi, kajian ini bermula dengan mengenalpasti pembaca *ESL* berprestasi tinggi dari satu populasi tertentu (pelajar diploma semester ketiga Universiti Teknologi Mara Perlis) berdasarkan pencapaian dalam satu ujian kebolehan membaca. Mereka juga diminta untuk memberi respons ke atas soalselidik ujian personaliti. Mereka yang berada pada aras 5% ke atas dari segi kebolehan membaca atau bersamaan 57 orang peserta telah dikenalpasti sebagai pembaca *ESL* berprestasi tinggi (*HPR*). Mereka dikehendaki menjalani sembilan ujian tekanan secara berasingan. Mereka juga diperlukan untuk membuat catatan refleksi tentang bagaimana mereka menghadapi ujian tekanan tersebut. Dapatan kajian menunjukkan *HPR* boleh dikenalpasti berdasarkan bidang pengajian mereka dan ciri personaliti yang positif. Kajian ini juga menunjukkan pencapaian pembaca *ESL* berprestasi tinggi mengalami kesan negatif hasil daripada kedua-dua faktor tekanan namun faktor tekanan kesukaran teks memberi kesan tekanan yang lebih berbanding faktor tekanan masa untuk bacaan. Tambahan lagi, tahap ambang toleransi terhadap tekanan hanya boleh dikenalpasti pada faktor tekanan kesukaran teks dan bukannya pada faktor tekanan masa untuk bacaan. Walaupun prestasi mereka pada umumnya

merosot apabila tekanan ditambah, mereka telah didapati menggunakan pelbagai strategi membaca dan strategi menangani tekanan. Strategi-strategi tersebut tidak menghentikan kemerosotan prestasi tetapi penggunan strategi-strategi tersebut menampakkan ciri pembaca yang baik. Dapatan kajian ini amat berguna bagi guru dalam membantu meningkatkan prestasi bacaan pelajar mereka  dan sebagai panduan kepada pembaca ESL berprestasi rendah dalam pengunaan strategi dalam menangani tekanan dalam bacaan.

# HIGH-PERFORMING ESL READERS' RESPONSE TO LOADING COGNITIVE STRESS IN READING COMPREHENSION PERFORMANCE

## ABSTRACT

This study on high-performing ESL readers' response to loading cognitive stress in reading comprehension performance was developed on the basis of Lazarus and Folkman's transactional theory of stress, mainly to know how good, good readers are. In doing so, the study focused on identifying high-performing ESL readers, investigating the influence of loading cognitive stress of time-on-task and text difficulty, and describing the strategies employed. Since the subject of this study was on high-performing ESL readers, the study began with identifying the high-performing readers from a specific population (third semester diploma students of Universiti Teknologi Mara Perlis) based on the performance in a reading proficiency test. Aside from the test, these students were also asked to respond to a personality test questionnaire. The top 5% of the population, i.e. 57 participants were then identified as high-performing ESL readers (HPR). They were made to sit for nine separate stress tests. These HPRs were asked to provide reflective journal entries on how they deal with the stress tests. The study found that the fields of study and the personality traits are good predictors of HPRs. Subsequently, the study found that the performance of the HPRs was negatively affected by both stress factors, but the stress factor of text difficulty was found to be the more strenuous. Furthermore, the threshold of the stress tolerance can be traced to text difficulty stress factor but not the time on task. Although the performance of the HPRs generally dropped as the stressors were intensified, they were found to be using a number of reading and coping strategies. The strategy used by the HPRs did not arrest the dropping performance but in itself showed these readers have good reader traits. The

information obtained from this study should be useful in assisting teachers in improving the reading performance of their students and also to guide the low-performing ESL readers to use specific strategies to cope with the reading stressors.

**CHAPTER ONE**

**INTRODUCTION**

**1.0    INTRODUCTION**

This first chapter previews what could be expected in the next few chapters. Hence, the first chapter presents the problems that led to the study, objectives of the study, research questions, rationale for the study, significance of the study, limitations of the study and the definitions of terms used throughout the study.

**1.1    BACKGROUND OF THE STUDY**

Among the four language skills, reading is deemed to be the most important skill of a language especially to English as Second Language (ESL) readers (Grabe, 2009). As a person begins to read, he may be exposed to different structures of the language, diverse usage of the words as well as distinct grammatical styles. With some proper exposures of these elements, reading can help to improve a person's language.

Most linguists generally agree that reading can be defined in terms of the processes involved (Downing, 1982; Grabe, 2009; Hyde & Bizar, 1989; Smith, 1982; Wallace, 1992). Hence, some would conclude that reading occurs when a reader tries to make sense of the text that is by interpreting and assigning meaning to the written code of the writers.

A person's ability to interpret and assign meaning of the written code in a written text, like learning, varies from one person to another. Researchers have found that despite reading the same materials, not all readers would be able to extract the

same amount of information or in the same manner (Danhua, 2009; Guthrie et al., 2004; Horiba, 1996; Johnson, 2007). The variations in their reading processes can be attributed to, among others, their language proficiency, the difficulty of the texts as well as the time on task (Kotani, Yoshimi & Isahara, 2010; Yamashita & Icikawa, 2010).

Readers who have strong control of the language will feel at ease in reading compared to those who are not. They are able to read "smoothly, without hesitation and with comprehension" (Harris & Hodges, 1995, p.85). This will enable them to read fast. Nevertheless, there would be occasions when these readers might experience some difficulties or stress with the text. These readers should view the difficulty or stress as a challenge rather than a threat (Lazarus & Folkman, 1984). Such attitude would enable readers to devise suitable strategies to enable them to read fast and with better comprehension. This is consistent with Nuttal's (1996) virtuous circle of good readers. Good readers are supposed to understand what they read better leading them to enjoy their reading. Because of the joy that they experience, they are expected to spend less time in reading texts which eventually encourages them to read more texts. For that reason, good readers are likely to obtain higher grades in any reading proficiency test. As a result of this, this group of readers can be classified as high-performing ESL readers because of their ability to achieve high grades in reading proficiency tests. Reading should proceed smoothly among these supposedly high-performing ESL readers. They are supposed to have acquired strong foundation of the target language and should also have gained control of the skills needed to enable them to easily and almost perfectly complete any reading comprehension task given to them.

In the context of stress in reading, high-performing ESL readers are expected to appraise and respond positively to any form of stress of reading. Studies have found that time on task and text difficulty, as stress factors of reading, may influence the appraisal and the response of the readers (Beatty & Care, 2009; Benjamin & Schwanenflugel, 2010; Pichette, 2005; Scott, 2009; Towse, Cowan, Horton & Whytock, 2008; Treptow, Burns & Mc Comas, 2007; Zeschel, 2008). If more time is given for the task, readers may appraise the texts positively and develop proper coping strategies for the task. Otherwise, they may not have enough time to devise proper strategies. Similarly, if the difficulty level of the texts is low, readers can quickly make sense of the text. However, if the level is high, readers may not have the ability to cope with such difficulty. The levels of stress depend on the individual abilities of the person which can be reflected in the appraisal and the response of the individuals to stress (Roth & Cohen, 1986).

## 1.2    THE STATEMENT OF THE PROBLEM

High-performing ESL readers are supposed to be good in reading. How good they are was the overall concern of this study. In accordance to the virtuous circle of good readers, good readers are supposed to read fast, read more, understand better and enjoy reading more than the less proficient readers (Nuttall, 1996). Nevertheless, this might not always be the case. The high-performing ESL readers could reach a threshold level where they might not be able to continue the momentum of the good readers as they would be forced to read slowly and understand little. On this occasion, the performance of the good readers would begin to display some form of regression. At what point their performance began to regress was not known.

On the other hand, it is assumed that each and every reader would want to become high-performing ESL readers as they would want to read with better understanding just like the good readers. In fact, there are some readers who would claim themselves to be in the group but they are actually not. They are just ordinary readers who would prefer to be associated as good readers. Studies have found that learners tend to overestimate their ability unless their actual proficiency is revealed (Sandman-Hurley, 2010). Therefore, relying on the readers' claim of their reading proficiency level would not be adequate to categorise them as high or low performing readers. Instead a more systematic and reliable proficiency test is required.

Despite the classification of the readers as being good, average and poor, different individuals would appraise and respond to stress factors differently. As a result, it would be difficult to accurately pre-determine how the readers would respond to a stress factor (de Janasz & Behson, 2007; Goff & Smith, 2005). The expectation would definitely be that these high-performing ESL readers would respond positively to stress, (as suggested in Nuttal's (1996) virtuous cycle of reading). Nevertheless, theoretically, the more stress is loaded, the more negative the response would be but whether this would also be applied to the high-performing ESL readers was not known. On that account, how far the cognitive stress factors of time and text difficulty influenced the reading comprehension performance of high-performing ESL readers was also not certain.

Aside from that, high-performing ESL readers are supposed to be good in coping with stress in reading. They are expected to be able to formulate suitable strategies to not just successfully manage stress but also to enable them to read text with better understanding (Nuttal, 1996). These high-performing ESL readers might

have used different but successful coping strategies which other readers might not be aware of (Brozo, 1990; Vik & Fellenius, 2007). Such strategies can be useful to the other readers if they are described.

## 1.3 AIM AND OBJECTIVES OF THE STUDY

The aim of the study is to determine how good, good readers are. Specifically, the objectives of the study are:

i. To identify high-performing ESL readers from a population of third semester diploma students using a reading proficiency test

ii. To investigate the influence of loading cognitive stress of time on task and text difficulty on reading comprehension performance of high-performing ESL readers of third semester diploma students

iii. To describe the strategies employed by the high-performing ESL readers

## 1.4 RESEARCH QUESTIONS

i. Who are the high-performing ESL readers?

    a. What are the features of the high-performing ESL readers?

    b. What are the personality traits of the high-performing ESL readers?

ii. What is the influence of loading cognitive stress on reading comprehension performance?

    a. To what extent is the performance of the participants against stress consistent with the proficiency of the participants?

    b. What are the effects of the stress factors of time and text difficulty on reading comprehension performance?

c. What is the threshold level of the high-performing ESL readers based on the performance against stress?

d. What is the relationship between gender and stressed performance?

e. What is the relationship between fields of study and stressed performance?

f. What is the relationship between personality traits and stressed performance?

iii. What are the strategies used by high-performing ESL readers?

a. What are the reading strategies used by the high-performing ESL readers?

b. What are the coping strategies used by the high-performing ESL readers?

c. What is the threshold level of the high-performing ESL readers based on the number of coping strategies?

d. What is the association between coping strategies and performance?

## 1.5 RATIONALE OF THE STUDY

First of all, the purpose of identifying high-performing ESL readers using a proficiency test rather than relying on the readers' claims of their status was to enable the researcher to obtain accurate, objective and reliable results of the readers' proficiency level. Their claim is made based on what they perceive to have. A claim that is made without proof of their actual proficiency is not reliable enough as some participants may be too modest to admit their high proficiency while some may even be too proud to confess their low proficiency. Therefore, in order to identify the readers' proficiency, relying on the readers' claims or perception may not be

adequate. Studies have found there was only some weak relationship between readers' perceived proficiency and the actual reading proficiency (Alverman & Van Arnam, 1984; Choi, 2006). This showed that the readers' claim or perception was not reliable enough. Therefore, proper testing of reading proficiency was essential in order to classify high-performing ESL readers.

Secondly, the study investigated the influence of loading cognitive stress factors of time on task and text difficulty. This enabled the researcher to investigate how the readers responded to stress. Good readers are expected to have the tendency to read faster, read more, understand and enjoy their reading better than the less proficient readers while the less proficient readers read less, understand less, read slower and enjoy their reading less than the more proficient readers (Nuttal, 1996). An increase in the stress factors of time on task and text difficulty should not hinder the high-performing ESL readers' comprehension of the text. Instead the increase should be a challenge to these readers to further improve their reading (Lazarus & Folkman, 1984). How far this can be expected from the readers was the concern of this study. Hence, the study ascertained how good these high-performing ESL readers were by investigating the influence of loading cognitive stress on reading comprehension performance of high-performing ESL readers.

Thirdly, in order to know how good the high-performing ESL readers are, the threshold levels of the high-performing ESL readers in terms of their stress tolerance have to be identified. The study could identify the threshold, i.e., the point in which the loading of the stress was too much for the readers based on the participants' inability to cope with the stress. On the other hand, the ability to resist stress in all the nine tests reflected how good the high-performing ESL readers were.

Furthermore, it is a false notion when everything should suit the person's pace and abilities. Though this should be the ideal situation, in most occasions, to work fast and to work on more difficult task is the common expectations. In other words, the stresses that may or may not have been intentional have to be embraced and coped. It was expected that high-performing ESL readers would be able to cope stress in reading. If they failed in their attempt to cope with the stress, then perhaps they might simply be not good enough despite being classified as high-performing ESL readers or they might have reached their threshold level in terms of stress tolerance. Such performances also indicated their limitations. For that reason, it was important to know how good these high-performing ESL readers were. This could be done by identifying the influence of loading cognitive stress on the comprehension performance of high-performing ESL readers. Such information would be useful to further improve the high-performing ESL readers.

Finally, the study was also meant to describe the coping strategies of the high-performing ESL readers. Being high-performing ESL readers, they were expected to devise workable and successful coping strategies to enable them to read the text faster and with better comprehension (Nuttall, 1996). Despite being high-performing ESL readers, some of them might not be able to produce workable and successful coping strategies as expected from them. Hence, by describing the coping strategies used by the high-performing ESL readers, the researcher could present the successful strategies, as well as the failed strategies from those who were not able to cope with the loading of cognitive stress. This could be useful to other readers who would experience text with loaded stress.

## 1.6 SIGNIFICANCE OF THE STUDY

The study was built on the foundation of bridging the knowledge gap that existed in the study of stress and the teaching of reading.

Firstly, it was essential that the influence of time on task and text difficulty were investigated. Studies have discovered that those elements contributed to the success of reading performance (Alvermen & Van Arnam, 1984; Benjamin & Schwannenflugel, 2010; Donne, 2011; Hiebert & Fisher, 2007; O'Connor, Bell, Harty, Kappel & Sackor, 2000). Nevertheless, not one of the studies has investigated on the influence of time on task and text difficulty on high proficient readers. This has led to the need to investigate the effects of the factors on high-performing ESL readers. Furthermore, most researches were found to focus on only one of the variables either time on task or text difficulty. In fact, only Veenman and Beishuizen (2004) identified text difficulty and time constraint as the moderating variables. However, their study focused on novice readers rather than good readers. Moreover, the extent of the effects on the performance of the readers between the two variables was also not determined. This led to the research gap of the two stress variables.

Secondly, focusing the study on high-performing ESL readers was important as research on reading have given more attention on struggling readers or readers with reading difficulties rather than readers who could perform well (Aini Akmar, 2008; Edmonds et al., 2009; Hall, 2009; Norazlina Ros, 2009; Steinbrink & Klatte, 2008; Subbiah & Singh, 2004). Furthermore, studies of reading in Malaysia also focused on low-performing readers instead of the high-performing ESL readers (Aini Akmar, 2008; Subbiah & Singh, 2004). On that note, the study would thrive for discoveries in the teaching of reading as well as the concept of stress in reading among high performing ESL readers. Griffith (2008) feels that a study on good

learners can also benefit other learners as they can be used as models on how to become good learners. For that reason, the study on high-performing ESL readers was very significant.

Thirdly, according to the virtuous circle of good readers, good readers are supposed to read the text faster, understand better, read more and enjoy their reading better than the less proficient readers (Nuttall, 1996). Consequently, it was expected that good readers would be able to overcome any form of cognitive stress in reading. Nevertheless, it was also expected that by being human, the high-performing ESL readers' performance in reading would not continuously be high. There would be a certain threshold level in which the high-performing ESL readers could fail to portray their true potential that would force them to exhibit a weakened reading performance. Due to this, it would be significant to note whether the threshold level of readers' performance could be detected from the stressors. Currently, no study on good readers was found to identify this threshold level.

Fourthly, from time to time, a person may experience some levels of stress. The person may be forced to face and cope with stress. Due to this, the question that most would ask is not on what type of stress but on how to deal or cope with stress. What strategies would the high-performing ESL readers prefer to use was the gap that this study intended to fill. Currently, very few studies look into the coping strategies of highly proficient students (Mofield, 2008). There has been no study found to look at the coping strategies of high-performing ESL readers in Malaysia. This has made the study to be very significant.

Finally, there has been a lot of research done on stress. However most of these studies in Malaysia focus on work and occupational related stress (Abdin, 2008; Azizi, Noordin, Kamariah, Jasmi & Saani, 2009; Md Ali, 1992; Mahmood

Nazar, & Sabitha, 1999; Thi & Lim, 2003;). There were very few studies on cognitive stress. There were even fewer studies on the influence of cognitive stress on reading. The existing research in Malaysia on time constraint as an element of cognitive stress as considered in this study was in the context of essay writing performance (Chan, 2007). However, Chan (2007) did not consider the time constraint as an element of cognitive stress. Due to the lack of research on the influence of cognitive stress on reading, this study was designed to bridge this knowledge gap of reading and cognitive stress.

## 1.7  LIMITATIONS AND DELIMITATIONS OF THE STUDY

This study was not without its limitations. Nevertheless, these limitations would not undermine the significance of the study. Among the limitations identified were the scope of the study, the participants involved in this study and the unavailability of specific instruments.

First, in terms of the scope of the study, the study focused only on cognitive stress and how it influenced reading comprehension. Since stress is a general concept, to identify all the stresses involved when a person undertook an activity would be too exhaustive. Consequently, it might also be highly impractical due to the limitation of the resources as well as the ability to attend to the entire task. Hence, in ensuring that the research was manageable, this study only focused on cognitive stress. Moreover, since reading involved some cognitive processing, cognitive stress instead of other types of stress would be the most appropriate.

Secondly, the study was also limited to just the influence of cognitive stress factors of time on task and text difficulty on reading comprehension. However, the factors influencing reading comprehension are not limited to just the two stress

factors. Other factors like readers' background knowledge, reading styles, reading strategies, intelligence, the text as well as the environment might also contribute to reading comprehension. However, it would be impossible for any one study to address on all the factors at one time. Therefore, in order to manage the study better, confining this study on the influence of the two cognitive stress factors on reading comprehension was appropriate.

Third, one of the independent variables of this study was text difficulty. In this study, the term text difficulty only referred to the structural difficulty of the texts rather than content difficulty of the texts. Though content difficulty is also part of text difficulty, the measure of content difficulty would be very difficult as it would involve both content and cultural schemata (Kreishen & Saidat, 2011). Aside from content difficulty, organizational difficulty may also be an issue. Text genre was found to also influence comprehension (Cervetti, Bravo, Heibert, Pearson & Jaynes, 2009). Text genre would also be traced in the participants' schema which would also be difficult to monitor (Pardo, 2004). Since the other factors of text difficulty involve the roles of the schema (Pardo, 2004), these factors would not be the criteria as they are difficult to be monitored. For these reasons, structural difficulty was the better option.

Fourth, the study also concentrated only on seemingly high-performing ESL readers as it was not meant to study other groups of readers. Generally, we can categorise readers into three categories: the low, the intermediate and the high-performing readers. A close-up was made only on the high-performing ESL readers ignoring the other two categories of readers. Only high-performing ESL readers would be most able to cope with the stress at the highest levels. If the study found that they could not cope, it was only obvious that the less proficient readers would

also not be able to cope. This was because the reading tests were structured in a way that the stress levels for each reading test was gradually increased. This was achieved by making the text to be gradually more difficult and the time on task to be gradually reduced. Thus, if high-performing ESL readers were not able to perform well, the less proficient readers would also not be performing well.

Lastly, unlike physical stress, the measure of cognitive stress was without specific tools or instrument. In measuring physical stress, a number of specific and reliable tools could be used to measure different forms of physical stress including the blood pressure, the heartbeat, the pulse and the temperature. Cognitive stress, however, was without such types of tools. Instead in determining whether the reader was experiencing cognitive stress, the researcher had to rely on reported feedback of the participants which was rather subjective. This was a challenge for the researcher as he had to produce a more valid and reliable test instrument to measure the influence of cognitive stress on reading comprehension performance.

## 1.8    OPERATIONAL DEFINITIONS

**Activity**

Activity refers to work that is done to achieve certain objective (Cambridge Advance Learner's Dictionary, 2005). Hence, a reading activity refers to the work that is done while reading whereas a coping activity refers to the work that is done while coping with the stress.

**Cognitive stress**

Cognitive stress refers to the relationships between the environment or stress factor and a person's cognition when he or she cognitively appraises the environment and employs coping strategies to deal with the change in the environment.

**Feature**

Feature refers to part of something that is considered significant and interesting (Longman Dictionary of Contemporary English, 2005). In this study, they refer specifically to gender and fields of study.

**High-performing ESL readers**

In this study, high-performing ESL readers refer to readers who may be able to respond to most if not all of the comprehension questions correctly. These types of readers may attain the highest score in reading tests. They are also classified as good or excellent readers as they are expected to read fast, read more, understand and enjoy their reading better (Nuttal, 1996). For the purpose of this study, high-performing ESL readers refer to the top rank readers based on the reading score that they obtained from the reading proficiency test.

**Strategy**

According to Oxford Advanced Learner Dictionary (2010), strategy refers to a plan of doing something so that the objectives would be achieved. Therefore, reading strategies are the plan used to read and understand the texts prior to identifying the stressful elements of the texts. These reading strategies include global reading strategy, problem-solving reading strategy and support reading strategy (Mokhtari & Sheorey, 2002). Meanwhile, the coping strategy refers to the plan or approach to cope with the increase of the stress. This would include confrontive, socisl support, self-control, distancing, accepting responsibility, escape-avoidance, problem-solving and positive reappraisal (Folkman & Lazarus, 1988).

**Stress**

Psychologically, stress, refers to the relationships between the environment or situation in which the person appraise and the available coping resources (Lazarus &

Folkman, 1984). The person will assess the environment to ascertain the significance of the situation to him. Then, the available coping resources are studied. If the problem exceeds the available coping resources, the person experiences stress. Nevertheless, the study extended the definition of stress to both what could or could not be overcome.

**Text difficulty**

Text difficulty refers to the difficulty level of the text. Such difficulty level depends to a certain extent on the language used in the text which includes the structure, the familiarity of the words and the length of the sentence (Ward, 2008). In the context of this study, text difficulty was defined within the scope of structural difficulty. Hence, in measuring the difficulty level of the texts used in the study, the study used the word count, the percentage of passive sentences, Flesch Reading Ease score and Flesch-Kincaid Readability Grade.

**Time on task**

Time on task is the amount of time spent to complete a reading task. How fast a reader can work on a reading task is different from one person to another. Good readers have the tendency to spend less time on a text but with better comprehension level than the less proficient readers (Nuttall, 1996).

## 1.9    CONCLUSION

This chapter has established an overview of the study on high-performing ESL readers' response to loading cognitive stress in reading comprehension performance. It has achieved this feat by providing some background information and the platform for the issues on cognitive. The chapter has presented the problems, the objectives, the research questions, the rationale, the significance, the limitation

and the definition of terms of the study. With these deliberations, the foundations for the study are established. The subsequent chapter which discusses the theoretical issues would further stress not only on the problems but also the significance as well as the relevancies of the study.

## CHAPTER TWO

## REVIEW OF RELATED LITERATURE

### 2.0    INTRODUCTION

The purpose of this chapter is to concentrate on the existing theories and research conducted which would be relevant to the study.  This would further reinforce the objectives, the rationale and the significance of the study. For these reasons, the chapter addresses and discusses three main areas of interest relevant to the study namely: cognition, stress and reading. The chapter ends by synthesizing the theories and relevant previous research in the form of the conceptual framework of the study.

### 2.1    COGNITION

As a lot of mental processes are involved in reading, a study on reading has to also discuss the cognition or the mental processes (Garner, 1988; Jefferson et al., 2011). On that note, the discussion on cognition in relation to reading comprehension and stress should begin with the cognitive constructs.

### 2.1.1   THE COGNITIVE CONSTRUCTS

As cognition is a very complex element, the constructs that make up the cognition is also complex. Among the cognitive constructs relevant to this study include metacognition, prior knowledge and working memory.

## 2.1.1.(a)      METACOGNITION

According to Flavell (1976), metacognition is an active ongoing monitoring of the cognitive process. When the individuals are aware of the cognitive process, metacognition is actually doing its work. On that note, Larkin (2010) classifies metacognition as higher thinking order in which the individuals become aware of what they are doing when the strategies are devised. For this to happen, Flavell (1981) believes that all the components of metacognition have to be at work. These components involve the cognitive goals, metacognitive knowledge, metacognitive experience as well the cognitive strategies employed. These components, despite their different names, are somewhat connected to one another as they complement each other.

The cognitive goal determines the outcome that is expected from the metacognitive process (Garner, 1988; Vrugt & Oort, 2008). This cognitive goal provides a preliminary input on the metacognitive knowledge that should be retrieved. The individuals will search within their memory for such knowledge. Once it is found, the metacognitive knowledge will access the information which may involve the subject matter, the task as well as the strategies to be employed. The information will be confirmed by the metacognitive experience of the individuals. They may, in the past, have encountered something similar to what they experience. Hence, by going through the metacognitive experience, cognitive strategies to undertake the task can be proposed.

However, as these metacognitive processes are interrelated, each of the components can dictate each other (Flavell, 1981). The cognitive goal can determine straight away the strategy to be employed without first referring to the metacognitive knowledge and metacognitive experience. Similarly, metacognitive knowledge can

prompt the strategy to be used without the "consultation" with the experience he has. (See Figure 2.1 below for illustrations).
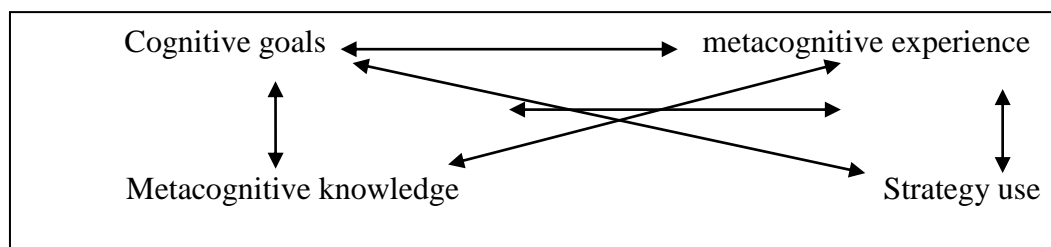


Figure 2.1  Flavell's model of metacognitive components (Garner, 1988)

Studies have found that metacognition stimulates self-regulation, individual awareness and responses (Dinsmore, Alexander & Loughlin, 2008). In this matter, metacognition assists individuals to take control of their learning.

In the context of reading comprehension, readers, being "active agents" of their own reading (Anderson, 1970, p. 349), apply metacognitive process in their reading. They predetermine their cognitive goals of making sense of the text. They will retrieve the metacognitive knowledge and metacognitive experience and decide on the reading strategies that they need to employ. In doing so, they have to monitor their comprehension. Unlike the less proficient readers who may lack knowledge and experience, ESL skilled readers or high-performing ESL readers may be able to access their existing knowledge in order to monitor their comprehension and at the same time, formulate better strategies (Ehrlich, 1996; Grabe, 2009; Perfetti, Marron & Foltz, 1996).

However, in metacognitive processing, the individuals would do a lot more than just monitoring comprehension. They are also involved in self-regulating their own reading (Byrnes, 2001; Dillon, 1986; Griffith & Ruan, 2005; Westen, 1999). They decide, on their own, the goals of reading. They self-assess, self-strategize as

well as self-adjust reading strategies and performance. All of these are done without the assistance from anybody. Hence, in the context of reading, metacognition plays a vital part of getting the readers to comprehend the text.

In fact, high-performing ESL readers can be expected to effectively use metacognitive skills in their reading (Joseph, 2010). They should be able to regulate and strategize their reading as well as assess and monitor their comprehension better. According to Laskey and Hetzel (2010), students with low reading proficiency use low metacognitive skills.

## 2.1.1.(b)    PRIOR KNOWLEDGE

Aside from metacognition, another component of the cognitive constructs is the prior knowledge. As mentioned earlier, metacognitive knowledge and experience which play important roles in reading require prior or background knowledge (Grabe, 2009). In fact, the metacognitive knowledge and experience continue to evolve from the new knowledge and experience that the individuals are exposed to.

In the metacognitive concept of reading, prior knowledge is significant in constructing a mental picture of the text (Griffith & Ruan, 2005). Readers tend to make connections between prior knowledge and the current text in order to visualize what is read. Without this prior knowledge, the construction of the mental image of the texts might be difficult. Readers who have established prior knowledge of the subject matter have less difficulty in developing the mental images. In other words, the prior knowledge or background knowledge enable readers to understand a text better (Grabe, 2009; Koda, 2005; Rapp, van den Broek, McMaster, Kendeou & Espin, 2007). In fact, prior knowledge was also found to facilitate readers in

answering multiple choice questions among upper intermediate level students (Gorjian, 2013).

However, problems may arise when the prior knowledge deviates from the new found information (van den Broek & Kendeou, 2008). The conflicting information could lead to the formation of new concepts. Nevertheless, for the new concepts to be formed,  readers may need to reject the existing prior knowledge. For this to happen, readers may need to feel the need to change their concepts (van den Broek & Kendeou, 2008). This would involve a longer process.

However, to weaker readers, the use of prior knowledge may lead to negative results as they may recall wrong information and make wrong inferences (Rapp et al. 2007). Nonetheless, studies have found that the impact of prior knowledge is minimal when the text is non-specialised in nature (Alderson & Urquhart, 1984; Long , Seely, Oppy & Golding, 1996). Comprehending texts with content specific or cultural specific knowledge requires some prior knowledge whereas texts of general nature may not require prior knowledge.

In the context of cognitive stress, readers' prior knowledge enables them to tap into their existing resources. By doing so, the readers may be able to appraise the reading texts more positively and apply more adaptive coping resources (Hancock & Szalma, 2008). On the other hand, without the prior knowledge, readers may not appraise the reading texts positively and may also apply maladaptive coping resources.

## 2.1.1.(b)(i)     SCHEMA THEORY

To better understand the concept of prior knowledge, a component of the prior knowledge in the form of schema theory needs to be discussed as well. Perfetti and Curtis (1986) define schema as the knowledge readers have about the meaning, concept, events and actions. This knowledge comes to existence as a result of the readers' experience in life and reading. Readers may be able to provide or utilize such knowledge in a new setting.  The knowledge which is stored in the long term memory enables readers to solve problems with the texts (Sweller, 2010). This knowledge is structured in the form of schemata (Byrnes, 2001).

According to Byrnes (2001), schemata come in two basic forms namely object and event schemata. These forms enable readers to recall appropriate knowledge and experience to assist them in comprehending texts. A fully established categories and concepts in the schemata can influence readers when inferences and interpretations are made (Ellis, 2005; Kintsch, 1988; Radvansky & Zack, 1997). Compared to  high-performing ESL readers, weaker readers often recall wrong information and draw wrong inferences as the knowledge structure may be partially developed or even nonexistent (Rapp et al., 2007). On the other hand, having more information of the text leads to different but probably efficient reading (Grabe, 2009). The schema of the information will enable the readers to recall relevant schemata to assist them in their reading.

The schema theory assumes that readers have stored within them a substantial amount of information that can be activated through concept recognition from words or passages read (Grabe, 2009). In other words, proponents of schema theory believe that prior knowledge is structured, organized and stored in a long-term memory.

Such mode will cause readers to behave in a stereotypical way due to their already established and structured thinking.

However, Kintsch (1988) feels that schema is unstable, tentative and continuously in the process of developing. New information will continue to be integrated to existing knowledge in order to stabilize the schema (Kalyuga, 2010). When the schema is stabilized and developed, automatic processing of the information would be possible. Nevertheless, such a thing will never happen as knowledge seems to be endlessly growing and developing and the schema will remain to be unstable and tentative. However, if the schema is stabilized, the cognitive demand of the working memory will be minimized (Moreno & Park, 2010).

The concept of schema theory is even extended to gender where certain gender is expected to behave in a certain manner. This is classified as gender schema theory. According to the theory, a stereotypical behaviour based on gender can be traced among male and female (Bem, 1981). Such behaviour is instilled in the individuals by the society and the behaviour reflects the expectations of the society on certain genders. In other words, the performances of the individuals are based on certain destined scripts (Grabill et al., 2005).

### 2.1.1.(c)    WORKING MEMORY

Cognitive construct is not limited to metacognition and prior knowledge only, it also includes the working memory. Working memory is the structure that is used to temporarily hold information (Sweller, 1999). The information is placed in the memory when readers are consciously processing the information. When new information is given some thought, older information will no longer be in the

working memory since the working memory has limited capacity. The fact is in every single minute, readers may be consciously thinking of a number of things. For that reason, if a lot of information has to be processed, readers will experience information overload. Nevertheless, if the information is transferred to the long-term memory structure, the load in the working memory can be minimized and, at the same time, make the information last longer. Then, the required information can be retrieved from the long-term memory and transferred to the working memory once there is a need to do so. This indicated that when schema is developed, the strain on the working memory can be reduced (Moreno & Park, 2010).

Similarly, working memory will respond to stress by thinking about the solution to the stress (Baddeley, 1986; Richardson, Engle, Harsher & Logie, 1996). When a certain task or stress is given to readers, the existing information that is required to process the task is transferred to the working memory for processing. The working memory will respond to the stress and devise solutions from the available information. If, however, the information is not available, the appraisal system of the readers will register negative responses. These readers, then, try to identify other available information that can be used to cope with the existing tasks or stressor. This is in-line with the Baddeley-Hitch model of working memory. The Baddeley-Hitch model identifies three components of working memory, the central executive, visuospatial sketchpad and the phonological loop (Baddeley, 2002). These components enable the information to be processed by retrieving resources, converting it into image, providing phonological representation and rehearsing naturally (Baddeley, 2002). Hence, it allows them to react to demands, devise the way out and ultimately meet its target.