THE RELATIONSHIP BETWEEN READING COMPREHENSION AND COGNITIVE FACTORS AMONG THE STUDENTS BETWEEN GOVT. AND NON GOVT. SCHOOL IN DHAKA CITY.

The Thesis Paper Submitted to the Department of Educational and Counselling Psychology in partial fulfillment of the requirements for the degree of Master of Philosophy (MPhil) in Educational Psychology at the University of Dhaka.

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Certification

I have perused the thesis paper entitled "**The relationship between reading comprehension and cognitive factors among the students between govt. and non govt. school in Dhaka city**." by the student Tanzina Chowdhury, Educational Psychologist in Training (EpiT-ll), Session: 2009-2010 in a fulfillment of the requirements for the degree of Master of Philosophy (MPhil) in Educational Psychology, Department of Educational and Counselling Psychology, University of Dhaka and that is a record of bona fide research carried out by her under my supervision and guidance.

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Declaration

I, Tanzina Chowdhury, student of MPhil in Educational Psychology, Department of Educational and Counselling Psychology, session 2009-2010, declare that this thesis paper titled on "The relationship between reading comprehension and cognitive factors among the students between govt. and non govt. school in Dhaka city." has been under taken under the supervision of Mahjabeen Haque, Associate Professor, Department of Educational and Counselling Psychology, University of Dhaka.

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Dedicated

To

My lovely mother

Nowajish Ara Khanom

And

father

A.K.Azad Chowdhury

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Firstly I add a special note of gratitude to the almighty Allah for making me able with a view to complete this study successfully. Words actually will never be enough to express my level best acknowledgement towards my honorable Supervisor Mahjabeen Haque, Associate Professor of Educational and Counselling Psychology, University of Dhaka, along with other teachers whose encouragement, sincere help, useful guidance, heartfelt advice, support and patience help me acquiring knowledge in various relative courses in consequently, I reach at this stage and have completed my study fruitfully.

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Any demerits and deficiencies remaining in this report must be attributed solely for me.

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Abstract

The objective of the present study was to investigate the relationship between the reading comprehension and cognitive factors among the students of government and non-government schools who were from class six to eight in Dhaka city. In order to achieve this end, the study was conducted on a sample of 300 secondary top and bottom school students aged 10 to 14 who were selected in a convenient way from two government and two non-government schools located in Dhaka city of Bangladesh. Bengali Version of WISC IV was administered to the students to assess reading comprehension and cognitive factors. The study was conducted following ethical guidelines prescribed by American Psychological Association (APA) and local norm. Obtained data was analyzed using descriptive statistics such as frequency distribution, mean and standard deviation. As the present study is correlation in its design, Pearson Product moment correlations and t test were calculated. Furthermore, to see the potential impact of cognitive factors on students' reading comprehension, the obtained data were analyzed by using linear multiple regression. It was found that non-government students' score were high rather than government students but the interesting finding was that female students' score was better than male students' in both types of schools. It was remarkable that though bottom students' overall score was low from top students' but in reading comprehension; their score was significantly high. The study also investigates the potential impact of cognitive factors (VCI, PRI, WMI, PSI) which were highly correlated with reading comprehension. The findings indicate, although minimal but there have alarming connection between reading comprehension and cognitive factors. This study would be helpful for school authorities, teachers, parents and early childhood educators to create successful readers since early grade and to organize effective programs which support target students' to overcome their reading comprehension difficulties.

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Chapter 01: Introduction

Introduction

To understand clearly about reading comprehension, it's important to know in details about reading. Reading is the ability to read text, process it and understand its meaning (Sattler, 2001). An individual's ability to comprehend text is influenced by their traits and skills, one of which is the ability to make inferences. It is a complex cognitive process of decoding symbols in order to construct or derive meaning. It is a means of language acquisition, of communication, and of sharing information and ideas. Like all language, it is a complex interaction between the text and the reader which is shaped by the reader's prior knowledge, experiences, attitude, and language community which is culturally and socially situated (Torgensen, Wagner, & Rashotte, 1999). The reading process requires continuous practice, development and refinement. In addition, reading requires creativity and critical analysis. Reading is such a complex procedure which cannot be controlled or restricted to one or two interpretations. There are no concrete laws in reading, but rather allows readers an escape to produce their own products introspectively (Block & Pressley, 2002). This promotes deep exploration of texts during interpretation. Readers use a variety of reading strategies to assist with decoding (to translate symbols into sounds or visual representations of speech) and comprehension. Readers may use context clues to identify the meaning of unknown words. Readers integrate the words they have read into their existing framework of knowledge or schema. Other types of reading are not speech based writing systems, such as music notation or pictograms. The common link is the interpretation of symbols to extract the meaning from the visual notations, or tactile signals. For this study, reading was the fluent recognition of words and grasping of implied meaning by relating words and sentences to each other, the text, and the reader's background intelligence (Wiederholt & Bryant, 2001).

Another definition of reading was the construction of meaning from print (Torgensen, Wagner, & Rashotte, 1999). The main goal of reading was to get meaning from print--comprehension. Reading ability is closely related with reading comprehension.

1.1 Reading Comprehension

According to Webster's Dictionary, reading is "to receive or take in the sense of (as letters or symbols)" by scanning; to understand the meaning of written or printed matter; to learn from what one has seen or found in writing or printing. Webster also tells us that comprehension is "the capacity for understanding fully; the act or action of grasping with the intellect." Comprehension means understanding (Shaywitz, 2003). Identifying words on a page does not make someone a successful reader. When the words are understood and transcend the pages to become thoughts and ideas then someone truly reading. Comprehension therefore is the capacity for understanding those thoughts and ideas. Applying what we have read and understood becomes the successful conclusion (Guernsey & Klare, 2001). When we comprehend what we read; it is like taking a trip around the world, staying as long as we like, visiting all the places we wish, and we never even having to pack a suitcase! Reading can be an escape that takes us outside the bounds of our existence. Reading is our ticket to whatever we choose to do and become. Reading is our future as well as our past. Who reads without thinking or who reads without a purpose; that is not reading.

Reading comprehension required skills such as word recognition, language comprehension, and background knowledge (Block & Pressley, 2002). However, for many students, reading comprehension was difficult and discouraging process. Regarding reading comprehension, some students have to face extremely frustrating experiences in school and life. Therefore educators, parents, and the public are now concerned about the negligence of great number of students with reading comprehension (Shaywitz & Shaywitz, 2001). It is the ability to interpret what the

information symbols represent, and to be able to re-create those same symbols so that others can derive the same meaning. Reading comprehension required skills such as word recognition, language comprehension, and background knowledge (Block & Pressley, 2002). There are three elements of reading comprehension which are reader, text and activity. It is somewhat difficult to treat context in the same way as reader, text and activity because context does not simply coexist with the other elements; rather, it interacts with all of them in any part of the reading process. The selection of texts to read, notions about the appropriate purposes for or consequences of the reading activity, and many of the factors that impinge on and differentiate readers are socio-cultural in nature; they vary as a function of economic resources, the local community, cultural membership, and family choice (Shaywitz, 2003). Schools represent particular kinds of socio-cultural contexts, which vary greatly for some learners and minimally for others from the contexts of home and community. We can also view classrooms as contexts with their own rules about who should be reading what text and for what purpose. These rules may be implicit or explicit, and they may be formulated to ensure that all children perform at a high level or to pose continued challenges to some children. Schools represent particular kinds of socio-cultural contexts, which vary greatly for some learners and minimally for others from the contexts of home and community (Guernsey & Klare, 2001). We can also view classrooms as contexts with their own rules about who should be reading what text and for what purpose. These rules may be implicit or explicit, and they may be formulated to ensure that all children perform at a high level or to pose continued challenges to some children.

There are two elements that make up the process of reading comprehension: vocabulary knowledge and text comprehension**.** In order to understand a text the reader must be able to comprehend the vocabulary used in the piece of writing. If the individual words don't make the sense then the overall story will not either. Children can draw on their prior knowledge of

vocabulary, but they also need to continually be taught new words. The best vocabulary instruction occurs at the point of need. Parents and teachers should pre-teach new words that a child will encounter in a text or aid her in understanding unfamiliar words as she comes upon them in the writing. In addition to being able to understand each distinct word in a text, the child also has to be able to put them together to develop an overall conception of what it is trying to say. This is text comprehension. Text comprehension is much more complex and varied that vocabulary knowledge. Readers use many different text comprehension strategies to develop reading comprehension. These include monitoring for understanding, answering and generating questions, summarizing and being aware of and using a text's structure to aid comprehension. There are several important sources of variability which help to get clear concept about reading comprehension.

1.2 Variability in Reading Comprehension

In reading comprehension, there are several important sources of variability. Such variables interact with one another and with the text to which the reader is exposed (the text can be narrative, expository, etc.) as determinants of performance on a given reading task (acquiring knowledge in a domain, performing a comparative analysis, solving a problem, etc.). Proficient readers bring to the task of reading an array of capabilities and dispositions. Reader differences in such capabilities as fluency in word recognition, oral language ability, and domain knowledge, along with differences in such dispositions as the reader's motivation, goals, and purposes. The capabilities and dispositions the reader brings to the task of reading, his or her engagement in and responses to given texts, and the quality of the out-comes produced by the act of reading for some purpose are, themselves, shaped by cultural and sub cultural influences, socioeconomic status, home and family background, peer influences, classroom culture, and instructional

history. These multiple and interacting factors influence both the inter- and intra-individual differences in reading proficiency that we must consider in defining reading comprehension as a field of study. Various comprehension processes in service of the various outcomes related to the act of reading for some purpose.

The four category typology in reading comprehension of readers: Dimensions associated with variation in what readers bring to the activity of comprehending any particular text. We see variation among readers as being analyzable at four levels:

1. Socio cultural factors. It helps to understand differences among readers in the way they define comprehension, the nature of opportunities that readers have to learn to comprehend, and the texts and comprehension activities that they value. For example, learners from some social groups experience a lack of congruence between their own definitions of literacy and those they encounter at school, whereas those from other social groups find the school-based texts and literacy activities familiar.

2. Group membership. It's may have an effect on certain reader capabilities directly or on reader access to support for acquiring comprehension capabilities. For example, teachers may have varying expectations of literacy success for children from low- versus middle-income families. Low-income readers are likely in general to have less-extensive vocabulary knowledge than middle-income readers. We are not concluding that membership in any of these groups can itself cause particular comprehension outcomes; rather, we are suggesting that documenting the differences may generate hypotheses about causal connections.

3. Individual differences. Among readers go beyond those that correlate with socio-cultural or group factors, reflecting the effect of biological, familial, or idiosyncratic factors. For example, the individual capacities that co-determine success in literacy acquisition, such as

short-term memory, vocabulary knowledge, or sensitivity to discourse markers, can show large differences among children from the same social group or family.

4. Intra-individual differences. Encompass the same dimensions as individual differences but arise from the fact that readers' deployment of their capabilities varies as a function of setting, text, and purpose for reading.

We review what we know and what we need to know about the many sources of reader variability in comprehension, noting explicitly that the correlations found between certain socio-cultural and group factors on the one hand and individual or intra-individual differences on the other cannot be taken to indicate causal relations. Researchers find out that there several cognitive factors which play vital role in reading comprehension.

The five-types of reading comprehension: To really understand the different levels of reading comprehension, (Pearson, P. David 2003) let's take a familiar text and see how different types of questions probe different understanding of the same story. The fairy tale Cinderella's fairy godmother, however, magically whisks her off for the night and Cinderella eventually marries her Prince Charming.

1. Lexical Comprehension. Understanding key vocabulary words in a text. Leveled readers are written in a way that too many big words are not used on the same page. In addition, if an unfamiliar word is used, it is generally explained within the same sentence or with a definition box in the margin. Also, words with multiple meaning may make it difficult for a less experienced reader to truly understand what is meant.

2. Literal Comprehension. Answers the questions who, what, when, and where with information found directly in the text; such as- what happened when the clock struck twelve? Or who was the girl who lost the glass slipper?

3. Interpretive Comprehension. Answers the questions what if, why, and how by inferring information from the text, i.e. how did the pumpkin turn into a carriage? or what would have happened if Cinderella hadn't lost her slipper?

4. Applied Comprehension. Answers opinion questions or questions that have the reader relate the new information to background knowledge; such as – do you think Cinderella was wrong for going to the ball after her step mother told her she couldn't?

5. Affective Comprehension. Understanding the social and emotional aspects of a text. If a student does not grasp why certain characters in a story may respond in a certain manner, they get lost in the words and the plot. Here is an example- hoe did Cinderella feel when she went to live at the castle? or while most students will answer "happy" or "excited" to this question, some students will say "sad", revealing a deeper appreciation for interpersonal and family dynamics than you may have expected.

1.3 Cognitive Factors

Cognitive factors refer to characteristics of the person that affect performance and learning. These factors serve to modulate performance such that it may improve or decline. These factors involve cognitive functions like attention, memory, and reasoning (Danili & Reid, 2006). Cognitive factors are internal to each person and serve to modulate behavior and behavioral responses to external stimuli. From the cognitive perspective of learning to read, reading comprehension (or simply reading) is the ability to construct linguistic meaning from written representations of language. This ability is based upon two equally important competencies. One is language comprehension–the ability to construct meaning from spoken representations of language; the second is decoding–the ability to recognize written representations of words. These two main foundations of reading are represented by the two

supporting legs in the graphic depiction of this cognitive framework. Often in the past, people considered reading ability a proxy for cognitive factors (Shaywitz, 2003). To understand what we do when we read was to understand the working of the human mind (Huey, 1908). Cognitive factors help to acquire capacity to operate within one's surroundings and the ability to learn.

1.4 Reading Comprehension and Cognitive Factors

To understand what we do when we read was to understand the workings of the human mind (Huey, 1908). Often in the past, people considered reading ability a proxy for cognitive factors (Shaywitz, 2003). Intelligence was the global capacity to operate within one's surroundings and the ability to learn. As Huey stated in 1908, there was a relationship between reading comprehension and cognitive factors.

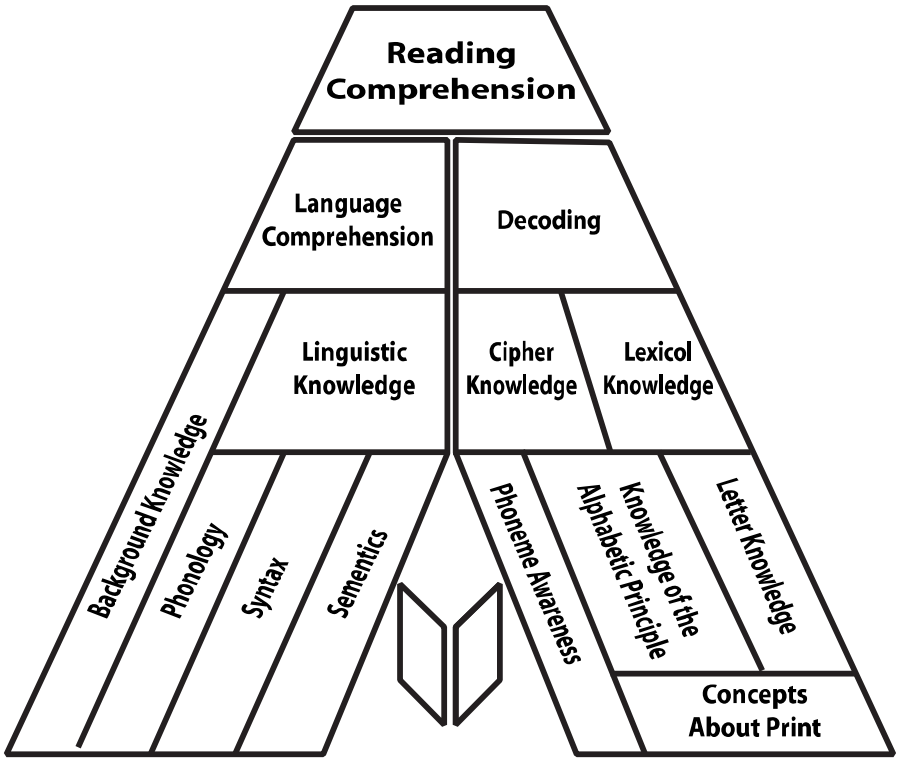

Fig 1.4.1 Cognitive perspective of Reading Comprehension (Wesley A. Hoover and Philip B. Gough, 1990)

Components of cognitive factors related to reading comprehension capacity, verbal comprehension, working memory, perceptual reasoning and processing speed (WISC-IV). These components are important not only for attend, process, and use information when reading (Naglieri & Reardon, 1993) but also for abstract reasoning, the capacity to acquire knowledge, and problem solving (Sattler, 2001). Verbal comprehension and working memory were important in long-term learning of new words and reading (Gathercole, Hitch, Service, & Martin, 1997). Children with reading difficulties often get lower scores for working memory.

To get more clear information about the relationship between reading comprehension and cognitive factors, it's components are also essential to discuss for current study which are-

1. Verbal Comprehension. Verbal comprehension consisted of short-term memory and retrieval skills used in the understanding of words, language comprehension, and background knowledge. It was involved in the acquisition of knowledge, thinking and reading (Gathercole et al., 1997).

2. Working Memory. Working memory was the power to actively sustain information, perform some operation (such as reading comprehension) with it, and produce a result (Wechsler, 2003b).

3. Perceptual Reasoning. This research defined perceptual reasoning as fluid reasoning. Fluid reasoning is the process of using abstract concepts, rules, generalizations, and logic to problem solve (Wechsler, 2003b). Often reading comprehension problems were due to a lack of an inference skill, which was a type of fluid reasoning (Swanson & Trahan, 1996).

4. Processing Speed. Processing speed was defined as a rapid processing and automatic reasoning along with efficient use of working memory for fluid cognitive performance and

development (Wechsler, 2003a). Assessment of processing speed is important because of its relationship to learning, development, and cognitive abilities such as reading (Kail, 2000).

The processing speed and perceptual reasoning processes that students used to integrate their existing knowledge with the new information gained from reading were important. Slow reading processing was a primary symptom of individual with reading difficulties (Shaywitz, 2003). Often reading comprehension difficulties were due to a lack of inference skill, which was a type of fluid perceptual reasoning. Speed of processing was part of reading performance and development. Assessment of processing speed was important because of its relationship to learning, development, and other cognitive abilities such as reading comprehension (Kail, 2000).

Both of these are complex abilities themselves, each based on their abilities, as shown in the graphic. In this simple view of reading, both language comprehension and decoding are necessary for reading comprehension success. Neither is sufficient in itself. On the one hand, being fully competent in a language but having no ability to recognize its written words will not allow successful reading comprehension. On the other hand, neither will having the ability to recognize the written words of a language but not having the ability to understand their meaning. In this view, the only route to successful reading comprehension is through success at both language comprehension and decoding. Weakness in either ability will result in weak reading comprehension. Thus, knowing where obstacles to reading and its acquisition exist requires assessing both language comprehension and decoding abilities.

1.5 Relation between Reading Components and Cognitive Factors

There are several areas of cognitive factors related to reading comprehension included verbal comprehension, working memory, perceptual reasoning and processing speed.

1.5.1 Reading Comprehension and Verbal Comprehension

As students develop, intelligence, especially verbal ability, becomes more closely connected to reading comprehension (Torgensen, 1999). Verbal comprehension is a part of cognitive factors. Gathercole, et al. (1997) stressed the importance of verbal comprehension in the following. Identifying the psychological processes that underpin the acquisition of vocabulary during childhood is therefore a priority both for psychologists concerned with building theoretical models of cognitive development and for educators interested in optimizing children's learning. Cognitive factors heavily influenced by level of vocabulary and verbal skills which essential in reading comprehension (Torgensen, 2000). Lack of vocabulary influenced reading comprehension and ultimately intelligence. Verbal intelligence and listening comprehension decreased in later grades because of the slow growth in vocabulary and language that resulted from impoverished reading experience. Although it was unrealistic to expect all children to be on the same level as their peers, students should comprehend at a level consistent with their general verbal ability. However, inadequate verbal knowledge limited a student's reading comprehension, no matter how well the words were pronounced (Torgensen,2000).

Students could only access the meaning of the words they knew. Students with reading comprehension difficulties may have heard a word, but they face such problems due to lack of word knowledge (Naglieri, 2001). Students with reading comprehension difficulties had a lower verbal score than average readers. Vocabulary deficiencies were the primary cause of academic failure of disadvantaged students in third through eighth grade (Block & Pressley, 2002). The relationship between reading comprehension and knowledge is very strong. Vocabulary is more than just accumulating facts or definitions. It means understanding the meaning(s), inferences, and nuances of words. Vocabulary acquisition is crucial to academic reading comprehension development. The number of words students learned varied greatly but increased with age. The

direction of the relationship between reading comprehension and vocabulary knowledge is not clearly understood, but it is a reciprocal relationship. The role vocabulary, short-term memory, and retrieval played in reading comprehension was unclear, and thus prediction of reading comprehension difficulty was especially problematic (Shaywitz, 2003). This pointed to the fact that educators needed a better understanding of the relationship between reading comprehension, verbal comprehension, and working memory for students with reading comprehension difficulties.

1.5.2 Reading Comprehension and Working Memory

Working memory is one area of cognitive factors associated with reading comprehension that we know a great deal about (Kintsch, Patel, and Ericsson, 1999). Working memory is a part of reading comprehension because students had to be able to remember a word and its meaning in context to comprehend the text when reading. Working memory significantly related to reading comprehension (De Jong and de jong, 1996). Reading comprehension resulted in the formation of new nodes in memory. Researchers linked reading difficulties and working memory problems. Working memory problems had significant implications for reading comprehension (Kintsch, et al., 1999).

Working memory problems might be a cause of reading difficulties in reading comprehension (Lewkowicz, 2004). When compared to children without reading difficulties, children with reading difficulties had lower scores for working memory (Gathercole, et al, 1997; Swanson, Mink, and Bocian, 1999; Wechsler, 2003b). Wechsler's (2003b) study found that there was a relation between reading comprehension and working memory for students with reading difficulty. Students with reading difficulties had less efficient word reading skills, which overloaded working memory, and undermined reading comprehension (Shaywitz, 2003).

Researchers found that for students with reading comprehension difficulties, the relationship between working memory deficits and poor reading comprehension was mediated by perceptual reasoning.

1.5.3 Reading Comprehension and Perceptual Reasoning

An area of cognitive factors that needed further study to clarify the relationship between reading comprehension and cognitive factors is perceptual reasoning. Often reading comprehension problems were due to a lack of inference skill, which was a type of perceptual reasoning. Reading relied on an understanding of implied meaning, which is a part of perceptual reasoning. Successful reading comprehension depends on vocabulary and perceptual reasoning (Leach, Scarborough, & Rescorla, 2003). Students with reading comprehension deficiencies exhibited inference difficulties in reading comprehension. Both verbal and perceptual skills are a part of reading comprehension (Bakken and Mastropieri, 1997).

Students with reading difficulties recalled less, had difficulty understanding characters, and had trouble inference (Block & Pressley, 2002). Such students have higher perceptual reasoning scores than working memory scores. Inference and reading comprehension are possible at an acceptable processing speed when automaticity is in place due to working memory (Torgensen, 1999).

1.5.4 Reading Comprehension and Processing Speed

Although perceptual reasoning is more strongly associated with reading comprehension than processing speed (de Jong & de Jong, 1996), processing speed is still considered important because of its relationship to learning, development, and other cognitive abilities such as reading comprehension (Kail, 2000; Raberger & Wimmer, 2003). Reading comprehension depended on

speed of processing (Chard & Kameenui, 2000). Speed of processing is related to comprehension because processing speed is reasoning and efficient use of working memory for fluid cognitive tasks such as reading comprehension. Because reading comprehension depended on integrating information into working memory, those with slower processing speed are less able to comprehend texts that are more difficult even if they could decode the words.

Lack of automated rapid reading speed might be a cause of reading difficulty (Kirby, Parrila, & Pfeiffer, 2003). If processing speed is a part of word access efficiency, it might be an index of working memory (Kirby, et al., 2003). Increased processing speed freed up capacity for higher order processes such as reading comprehension (Naglieri, 2001). Educators needed to understand the precise nature of the role of processing speed to improve assessment.

1.6 Government and Non-Government School

In this study, data has been collected from both government and non-government schools which definition has been stated here. Educational institutions such as universities, colleges and technical schools funded and overseen by government rather than private entities. It is often organized and operated to be a deliberate model of the civil community in which it functions. Government make a public policy decision that it wants to have some financial resources distributed in support of, and it may want to have some control over, the provision of private education. Though government is trying to start inclusive education, both in its treatment of students and in that enfranchisement for the of public education is as broad as for government generally. It is often organized and operated to be a deliberate model of the civil community in which it functions. Grants-in-aid of private schools and vouchers systems provide examples of publicly funded private education.

Non-government school an independent school supported wholly by the payment of fees that means a school supported by a private organization or private individuals rather than by the government. It is the term commonly used for an organization that is neither a part of a government nor a conventional for-profit business. Usually set up by ordinary citizens, which may be funded by governments, foundations, businesses, or private persons. Some avoid formal funding altogether and are run primarily by volunteers. Non-government schools are highly diverse groups of organizations engaged in a wide range of activities, and take different forms in different parts of the world. Some may have charitable status, while others may be registered for tax exemption based on recognition of social purposes. Others may be fronts for political, religious or other interest groups.

1.7 Emergence of the Present Problem

If one was to improve current reading comprehension assessments, increasing knowledge in reading difficulties by finding factors in the assessment of reading and cognition that lead to successful reading was of utmost importance (Felton, 2001). The specific problem the researcher examined was the relationship between reading comprehension and cognitive factors for students with reading comprehension difficulties. Intelligence (IQ) predicted reading comprehension achievement in older children because intelligence was influenced by vocabulary and verbal skills (Torgensen, 2000). Vocabulary comprehension was thought to be one factor of both reading and intelligence (Togensen, 2000). Gathercole et al. (1997) stressed the importance of verbal understanding in reading comprehension. When compared to children without reading disabilities, children with reading disabilities had lower scores for working memory (Gathercole et al., 1997). Often reading comprehension problems were due to a lack of inference skill, which was a type of fluid perceptual reasoning. Speed of processing was part of reading performance

and development. Assessment of processing speed was important because of its relationship to learning, development, and other cognitive abilities such as reading comprehension (Kail, 2000). However, until today no attempt has been yet been made directly to examine whether reading comprehension can predict cognitive factors in students academic result. Furthermore, research on such a topic is seldom done in Bangladesh. Thus, it is not clear how reading comprehension is related with cognitive factors in Bangladesh. So, the present study was undertaken to investigate the relationship between reading comprehension and cognitive factors between the government and non-government schools students in Dhaka city.

1.8 Purpose of the present study

Cognitive factors predicted reading comprehension achievement in older children because it was influenced by vocabulary and verbal skills (Torgensen, 2000). Vocabulary comprehension was thought to be one factor of both reading and cognitive factors (Togensen, 2000). Gathercole et al. (1997) stressed the importance of verbal understanding in reading comprehension. To improve current reading comprehension assessments, increasing knowledge in reading factors by finding variations in the assessment of reading and cognitive factors that lead to successful reading was of utmost importance (Felton, 2001). The specific problem the researcher examined was the relationship between reading comprehension and cognitive factors for students between government and non government schools in Dhaka city. Often reading comprehension problems were due to a lack of inference skill, which was a type of fluid perceptual reasoning. Speed of processing was part of reading performance and development. Assessment of processing speed was important because of its relationship to learning, development, and other cognitive abilities such as reading comprehension.

However, until today there has been a seldom of studies on reading comprehension and cognitive factors among top and bottom students of government and non-government school in Dhaka city. Furthermore, no systematic study has been conducted on this issue in the cultural context of Bangladesh. Thus, it is not clear how reading comprehension is related to cognitive factors in Bangladesh. So, the present study, therefore, is an attempt to predict the relationship of reading comprehension and cognitive factors.

1.9 Objective of the study

The main objective of the study is to understand the relationship between reading comprehension and cognitive factors among the students between government and non-government school in Dhaka City.

Specific objectives are-

1. To identify the variation between reading comprehension and cognitive factors among the students of government and non-government school.
2. To examine the deviation between reading comprehension and cognitive factors among the top and bottom students of different classes.
3. To explore the divergence between male and female students.
4. To investigate the impact of cognitive factors (VCI, PRI, WMI, PSI) that is highly correlated with reading comprehension.

1.10 Rationale of the study

Everyone agrees that reading comprehension is not a simple matter of recognizing individual words, or even of understanding each individual word as our eyes pass over it.

Comprehension is the ultimate goal of reading. Relationship between reading comprehension and cognitive factors among the students has been well documented in the West. Unfortunately there is dearth of scientific investigation surrounding this area in Bangladeshi context leaving school administration, parents, teachers, counselors and policy makers unaware on this issue. Finding of this study is an addition in the knowledge base. School Management Committee, parents and teachers can be benefited. School counselors and educational psychologist can use the study findings in their practice. Finally outcomes of this study will help policy makers and other child health professionals to advocate for environment where a child can get support properly.

A need to analyze the relationship of reading comprehension and cognitive factors for students to determine the underlying cognitive factors related to reading comprehension existed; which was trying to investigate in this study. The intention of the study was to investigate quantitative techniques to assess and evaluate top and bottom students individually in a best way to find out the effective cognitive factors which are related with reading comprehension. A better understanding and increased knowledge of the relationship between reading comprehension cognitive factors might empower educators when assessing any student with reading comprehension difficulties.

This inquiry might enable the educational team (teachers, parents, psychologists, management, counselors, doctors, therapist etc.) to determine the specific cognitive profile of every top and bottom grade student. This study hoped to create a more effective way of assessing students' difficulties area which is related with reading comprehension. This study examined the relationship between reading comprehension and areas of cognitive factors, so educators might create more effective intervention plans for every student according to their difficult areas.

Chapter 02: Method

Method

2.1 The Population

The secondary students from grade vi to viii were regarded as the population of the present study. The population covers almost same socioeconomic classes. These age and grade range was chosen because this is the time when reading comprehension is learned; practiced; established (Shaywitz, 2003). However, the participant's gender, grade, age, socio-economic status or parental educational level was not chosen but random. Top ten and bottom ten students were selected according to their academic results which were given by class teachers. Most of the students were having difficulties in the area of reading. Both school authority and parents gave consent at that time with assurances of confidentiality.

2.2 Sample

Data were collected from 310 students (boys=155, girls=155) aged between 10 to 14. Participants were selected conveniently from different government and non-government schools of Dhaka city. At first four schools (government=2, non-government=2), were selected conveniently. From each selected school the 6^{th} to 8^{th} grade students attending the class were included in the sample. 10 participants were excluded from final analysis due to absence when expected.

Among the remaining 300 participants 149 were boys and 151 were girls. Respondents' age ranged between 10 to 14 years. According to age and grade- participants' percentage is stated here; there were 101 ten to twelve-years old from 6^{th} grade (33.67%), 99 thirteen-years old from 7^{th} grade (33%) and 100 fourteen-years old from 8^{th} grade (33.33%). While the 6^{th} grade students were little bit more in number and percentage of this study, the average age was twelve years old.

Table 2.2.1: *Sex and grade wise distribution of government and non-government sample*

	Government (2)		Non-Government (2)		Total
Grade	Male	Female	Male	Female	
Six	24	26 (=50)	24	27 (=51)	101
Seven	26	24 (=50)	26	23 (=49)	99
Eight	25	26 (=51)	24	25 (=49)	100
Total	75	76 (=151)	74	75 (=149)	300

Equal number of children in respect to gender from both government and non-government sample was included for each grade. Table 2.1 illustrates sex and grade wise distribution of the study sample. Students' socio-economic status (SES) did not get priority, as there was nothing to indicate on this study.

2.3 Measures

The following measures were used in the present study.

2.3.1. Wechsler Intelligence scale for children – Fourth Edition (WISC-IV). The *Wechsler Intelligence Scale for Children-Fourth Edition* (WISC-IV) Bengali Version is an individually administered clinical instrument for assessing the cognitive ability of children aged 6 years 0 months through 16 years 11 months. This fourth edition of the *Wechsler Intelligence Scale for Children* is a significant addition to this series of tools for educational, clinical and diagnostic assessment of cognitive abilities. Therefore, it is an essential tool for any psychological assessment.

This version provides subtest and composite scores that represent intellectual functioning in specific cognitive domains, as well as a composite score that represents general intellectual ability. The WISC-IV is composed of 15 subtests: there are 10 core subtests divided among the four indices as follows: three Verbal Comprehension, three Perceptual Reasoning, two Working Memory, and two Processing Speed subtests. Similarities, Vocabulary and Comprehension are the core Verbal Comprehension subtests. Block Design, Picture Concepts, and Matrix Reasoning are the core Perceptual Reasoning subtests. Digit Span and Letter-Number Sequencing are the core Working Memory subtests where Coding and Symbol Search are the core Processing Speed subtests.

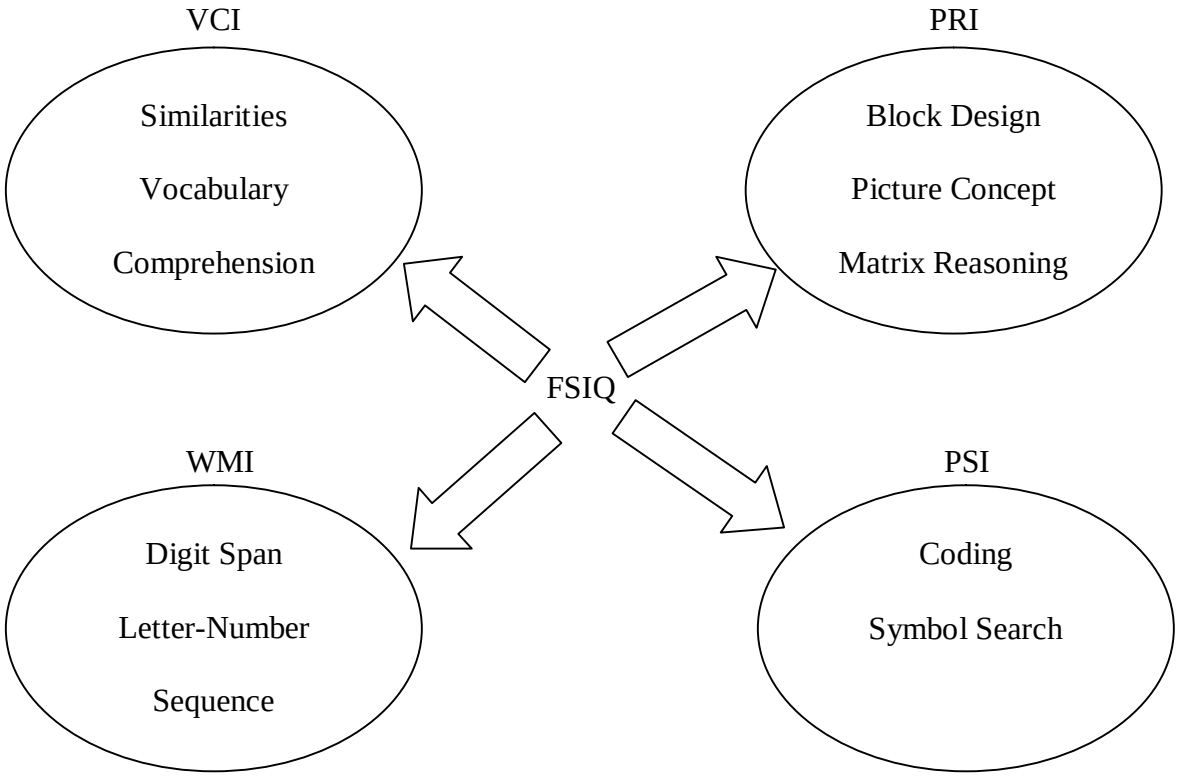

Fig : 2.3.1.1 WISC-IV Test Framework

As a psycho educational tool, the WISC-IV is used to obtain a comprehensive assessment of general cognitive functioning.

2.3.2. Adapted Bengali version (Fatema & Afrose, 2011) of Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV). WISC IV developed by David Wechsler (2003), adapted by Fatema & Afrose (2011). WISC IV composed of 15 sub tests such as Block Design, Similarities, Digit Span, Picture Concept, Coding, Vocabulary, Letter-Number Sequencing, Matrix Reasoning, Comprehension, Symbol Search, Picture Completion, Cancellation, Information, Arithmetic and Word Reasoning. Out of 15 sub-tests 10 tests are core sub-tests. These are assumed to four indexes (the Verbal Comprehension Index, the Perceptual Reasoning Index, the Working Memory Index and the Processing Speed Index) and one full Scale IQ (FSIQ). The score in each area (indexes) will indicate ability in these four areas and FSIQ indicate the cognitive ability. It is an individually administered clinical instrument for assessing abilities of children aged 6 years through 16 years 11 months.

The introduction of the index scores gave practitioners the ability to use WISC IV partially for research purpose. When necessary to aid in interpretation, the practitioner could describe verbal abilities using the VCI in place of the VIQ (Raiford, S.E., Weiss, L.G., Rolfhus, E., Coalson, D. 2006). In the present research, ten core subtests (similarities, vocabulary and comprehension) of verbal ability index, (block design, picture concept and matrix reasoning) of perceptual reasoning, (digit span, letter-number sequence) of working memory and (coding, symbol search) of processing speed were administered and the obtained scores were used as the indicator of the relationship between reading comprehension and cognitive factors.

2.3.3. English WISC IV Reliability & Validity. Original WISC IV is highly valid and reliable test. Different types of ways were followed to determine its reliability and validity.

Test-retest reliability was computed based on 60 children across the 11 age groups, tested twice in 32 days on average (13 to 63). Results were at minimum .76, but most were in the .80s. Inter scorer reliability by experts was generally .98, with Comprehension dipping to .95.

For Convergent Validity, correlations between the WISC IV and WISC III seem most appropriate and which has stronger correlations. Results of this are below:

Table 2.3.3.1: *Correlations between the WISC IV and WISC III*

WISC III	WISC IV	Correlation
VCI	VCI	.88
POI	PRI	.72
FDI	WMI	.72
PSI	PSI	.81
FSIQ	FSIQ	.89

Source: Wechsler Intelligence Scale for Children-Fourth Edition Manual

2.3.4. Bengali WISC IV Reliability & Validity. The internal consistency reliability of WISC-IV split-half method was used. The correlation coefficients for all 12 subtests were very high which indicates strong internal consistency among within the subtests. The correlation coefficient for 12 subtests (Block Design, Similarities, Digit Span, picture Concept, Vocabulary, Letter-Number Sequencing, Matrix Reasoning, Comprehension, Picture Completion, Information, Arithmetic and Word Reasoning) were found to be .77, .92, .86, .83, .96, .93, .88, .90, .91, .93, .93, .80. The correlation coefficients were significant at .01 level. Split-half method

cannot be used for three subtests (Coding, Symbol Search, and Cancellation) because those subtests are speed tests which have only one total score.

In case of test-retest method, Pearson's Product Moment Correlation Technique was used. The reliability coefficient was found to be .97, .98, .98, .98, .98, .97, .98, .98, .84, .96, .98, .97, .98, .97 for 15 subtests respectively. The coefficient for full scale score was .99. and significant at .01 level. In order to determine the validity of WISC-IV two methods were used.

For determine concurrent validity it was found that correlation coefficient between WISC-IV and WISC-R was .97 which was significant at .01 level.

The validity of the test was also measured by contrast group method. The two contrast groups were normal and mentally retarded children. It was found that there was statistically significant difference between the mean of normal (M= 96.16) and mentally retarded (M= 52.76) children in core subtest score and also between supplement subtest score mean of normal (M= 96.26) and mentally retarded (M= 53.13) children.

2.3.5. Demographic information collection format

This format recorded respondents' class, age, sex, class position, academic results, parents' education, occupation, family income.

2.4. Procedures

Standard data collection procedures were followed in the proposed study. Following ethical approval from the University of Dhaka the data collection process began. That is, the researcher personally met each of the principal of the selected schools, narrated the general purpose of the study and finally got permission to collect relevant data from the students. Data collection process included getting permission from school authority, establishing rapport with

the children and finally collecting the actual data. The following section depicts detail procedures of each selected school.

On the appointed date and time the researcher went to a particular school and then to the classroom where she was introduced by the principal or head of the school with the 6th, 7th and 8th grade students of boys and girls sections. Before applying the test to collect data, she addressed the connected teacher and class representatives of the schools to inform the actual purpose of the study. At the beginning, the general purpose of the study was briefly described the participants and requested to cooperate with the researcher. The participants were also informed that the data collection is purely academic and their responses to the questionnaires would be kept confidential. When the psychological climate of the class was good enough for data collection, then students were chosen conveniently and took them individually into a separate classroom to talk regarding how he or she feels today, do they have friends, what they like or do not like, how they spent their leisure time at home or school, which subject they like or dislike and the reason of that, which teacher they like or dislike most and what is the reason of that, do they like or dislike their parents and what is that reason, do they get any physical, mental or any other punishment at home or school etc.

This way strong rapport was build up within one week. Before administer the test, every subtest was instructed verbally to each student so that they can understand properly. Also further clarifications were done whenever they faced any problem to understand the items. Each participant filled up the demographic data separately. This way, data was collected from each class about more than one month. After completion of their task they were given thanks for their sincere cooperation. Thus data collection was completed approximately in 20 to 24 weeks.

Following the above protocol, data collection procedure, steps were applied as the same manner. In this way, the present researcher went to the different government and non-government schools of Dhaka city.

2.5 Data Analysis

In order to meet the objectives of this study, data were coded and analyze using computer program SPSS 16 version. At first, descriptive statistics such as frequency distribution, mean and standard deviation were conducted. As the present study is correlation in its design, Pearson Product moment correlations were investigated between reading comprehension and cognitive factors. To investigate whether there any variance between male, female or different grade or school types; t-test was conducted. Furthermore, to see the potential impact cognitive factors on students' reading comprehension, the obtained data were analyzed by using linear multiple regression.

Chapter 03: Results

Results

3.1. Descriptive statistics of the study variables

In order to illustrate descriptive statistics of the study variables, frequency distributions are presented for the categorical variable while mean and standard deviation (SD) are mentioned for the continuous variables. As can be seen from the stated table, nearly half of the participants' mother's educational qualification masters (43%) while for fathers it is much more which (73%) is. Regarding family type and family structure, participants' come from almost same category of family (urban, rural, joint or nuclear) which is almost 50%. In relation to number of siblings, nearly half of the participants' siblings' no. is two (49.3%) while less than three quarters have one or three siblings.

3.2. Mean and SD of reading comprehension and cognitive factors between government (151) and non-government (149) students (N=300)

Table 3.1. presents Mean and SD of reading comprehension and cognitive factors in both government and non-government schools which are measured in this study.

Variable category	School	Mean	Std. Deviation
Block Design	Government	31.66	9.446
	Non-government	32.93	9.303
Similarities	Government	13.39	2.366
	Non-government	13.54	2.335
Digit Span	Government	13.16	2.482
	Non-government	14.09	2.628
Picture Concept	Government	10.65	2.127
	Non-government	11.56	2.179
Coding	Government	88.73	12.263

	Non-government	90.24	11.929
Vocabulary	Government	46.66	3.462
	Non-government	47.44	3.574
Letter-Number Sequence	Government	13.21	2.453
	Non-government	14.07	2.623
Matrix Reasoning	Government	11.38	3.017
	Non-government	12.38	3.070
Symbol Search	Government	38.48	5.827
	Non-government	41.95	5.452
Reading Comprehension	Government	22.13	4.306
	Non-government	22.93	4.225

From the table (3.1.); it is clear that in most of the subtests like verbal comprehension (similarities, vocabulary, reading comprehension), perceptual reasoning (block design, picture concept, matrix reasoning), working memory (digit span, letter-number sequence), processing speed (coding, symbol search) non-government students mean *M* and *SD* is higher rather than government school.

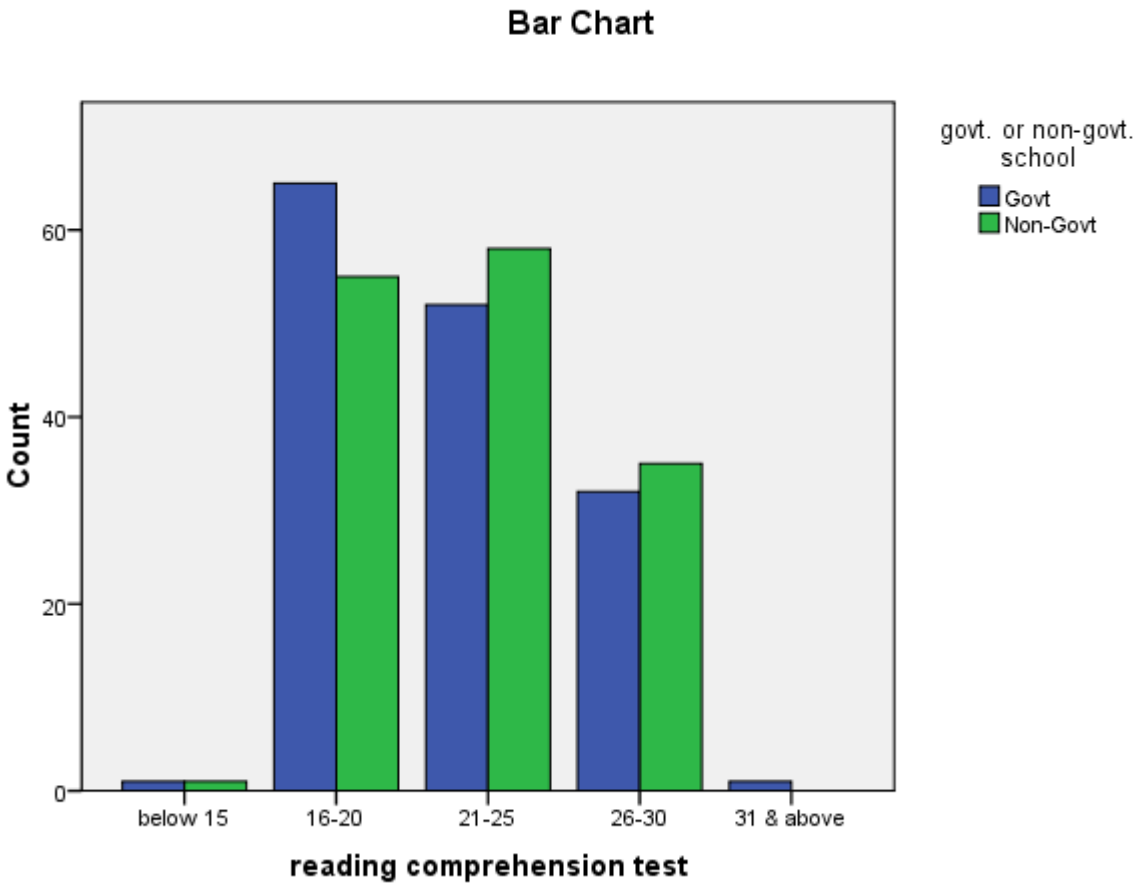

Fig 3.1. Comparison between government and non-government school students' scores according to reading comprehension

Table 3.2. Mean and SD of reading comprehension and cognitive factors between top and bottom students of government and non-government schools (N=300)

Variable category	Roll no	Mean	Std. Deviation
Block Design	Top ten	39.90	4.914
	Bottom ten	24.78	6.111
Similarities	Top ten	13.32	2.425
	Bottom ten	13.60	2.269
Digit Span	Top ten	15.46	2.335
	Bottom ten	11.80	1.149

Picture Concept	Top ten	12.41	1.581
	Bottom ten	9.81	1.942
Coding	Top ten	100.81	5.708
	Bottom ten	78.30	2.519
Vocabulary	Top ten	46.21	2.511
	Bottom ten	47.87	4.161
Letter-Number Sequence	Top ten	15.47	2.315
	Bottom ten	11.83	1.124
Matrix Reasoning	Top ten	14.01	2.503
	Bottom ten	9.77	1.940
Symbol Search	Top ten	45.14	3.100
	Bottom ten	35.32	3.413
Reading Comprehension	Top ten	21.70	4.136
	Bottom ten	23.34	4.272

From the stated table, it is revealed that in most of the items non-government students' average score is greater than government students and also can be seen that though top students' score is high in most of the items (perceptual reasoning, working memory and processing speed) rather than bottom students but in case of verbal comprehension (reading comprehension, similarities and vocabularies); bottom students' score is more than top students.

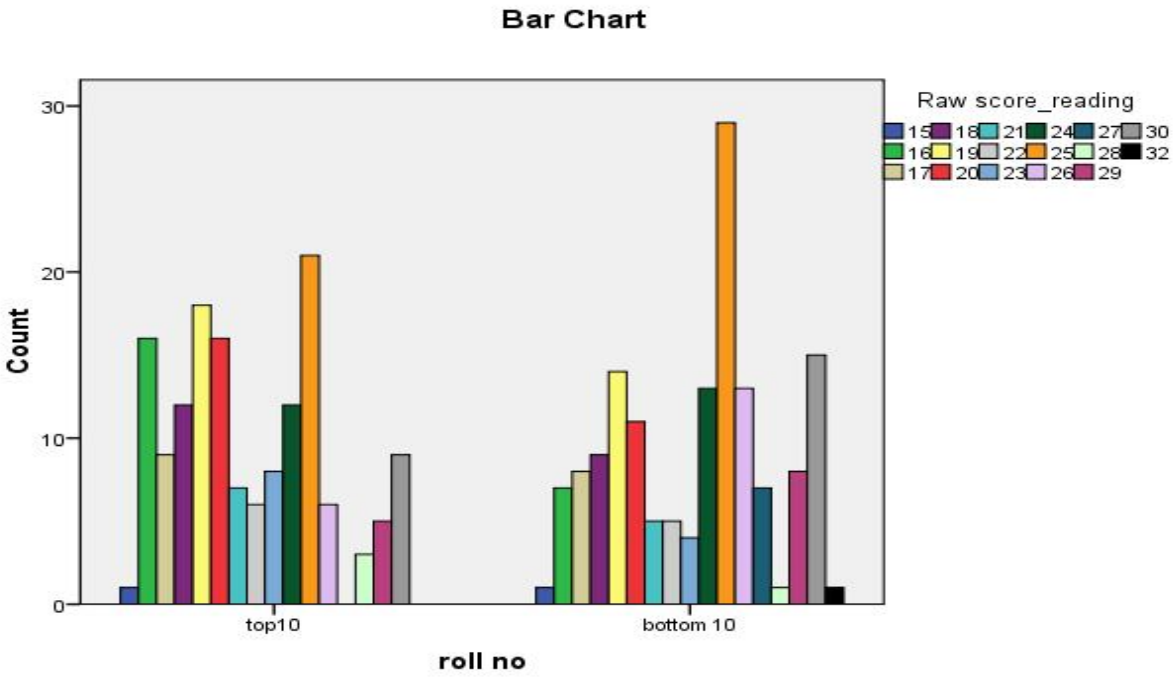

Fig 3.2. Comparison between top and bottom students' scores according to reading comprehension

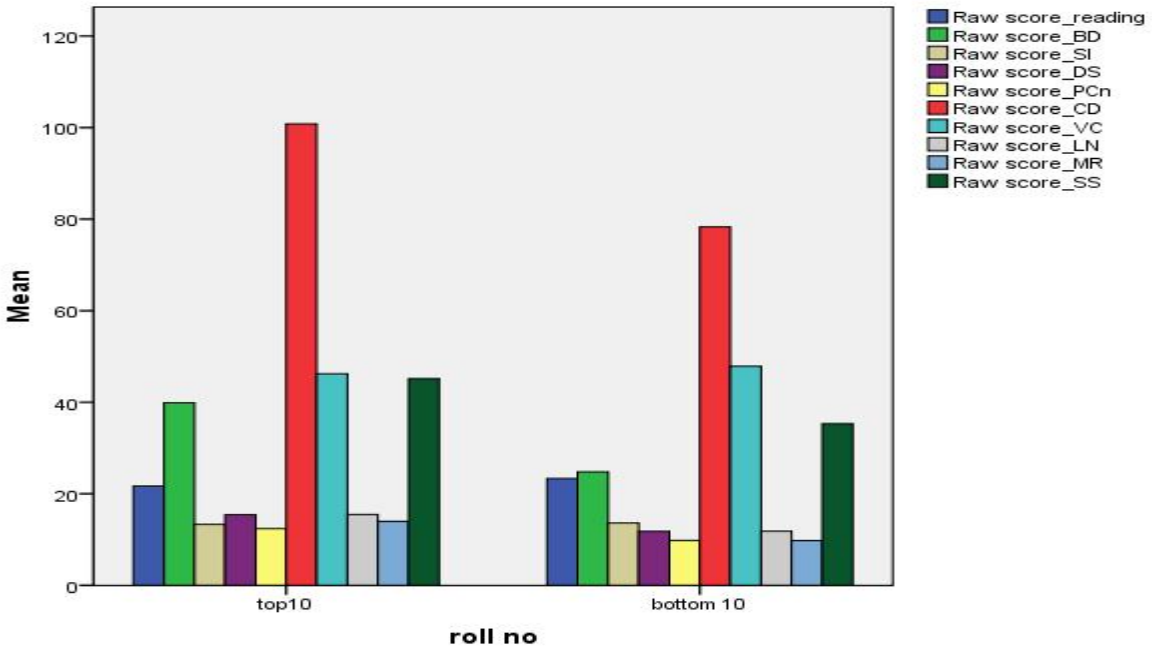

Fig 3.3. Comparison between top and bottom students' scores according to cognitive factors

Table 3.3. Mean and SD of reading comprehension and cognitive factors according to the sex among the students (M=149, F=151)

Variable category	Sex	Mean	Std. Deviation
Block Design	Male	31.93	9.509
	Female	32.65	9.272
Similarities	Male	13.42	2.366
	Female	13.51	2.338
Digit Span	Male	13.54	2.606
	Female	13.70	2.587
Picture Concept	Male	10.87	2.185
	Female	11.32	2.193
Coding	Male	89.03	12.135
	Female	89.92	12.093
Vocabulary	Male	46.94	3.585
	Female	47.15	3.492
Letter-Number Sequence	Male	13.56	2.582
	Female	13.71	2.568
Matrix Reasoning	Male	11.62	2.992
	Female	12.13	3.151
Symbol Search	Male	39.67	5.953
	Female	40.72	5.813
Reading Comprehension	Male	22.38	4.171
	Female	22.67	4.389

Table 3.3. presents that female students' scores are more than male students' scores in most of the subtests for all classes which is found in both government and non-government schools.

3.3. Independent Samples t-test

Next to find out significant variance among the factors (reading comprehension, similarities, vocabulary, coding, symbol search, digit span, letter-number sequence, block design, picture concept, matrix reasoning) between government and non-government schools.

Table 3.4. Independent Samples t-test (according to types of schools)

Variable category	School type	Mean	t	Sig.
Block Design	Government	31.66	-1.180	.239
	Non-government	32.93		
Similarities	Government	13.39	-.538	.591
	Non-government	13.54		
Digit Span	Government	13.16	-3.146	.002*
	Non-government	14.09		
Picture Concept	Government	10.65	-3.653	.000*
	Non-government	11.56		
Coding	Government	88.73	-1.083	.280
	Non-government	90.24		
Vocabulary	Government	46.66	-1.938	.054
	Non-government	47.44		
Letter-Number Sequence	Government	13.21	-2.963	.003*
	Non-government	14.07		
Matrix Reasoning	Government	11.38	-2.822	.005
	Non-government	12.38		
Symbol Search	Government	38.48	-5.323	.000*
	Non-government	41.95		
Reading Comprehension	Government	22.13	-1.625	.105
	Non-government	22.93		

Table 3.4. Presents the variance as well as significant relationship among these results according to the category of the school. From the result, it is found that digit span, picture concept, symbol search and letter-number sequence significantly differed between government and non-

government schools. In case of reading comprehension, there is no significant difference of two types of school.

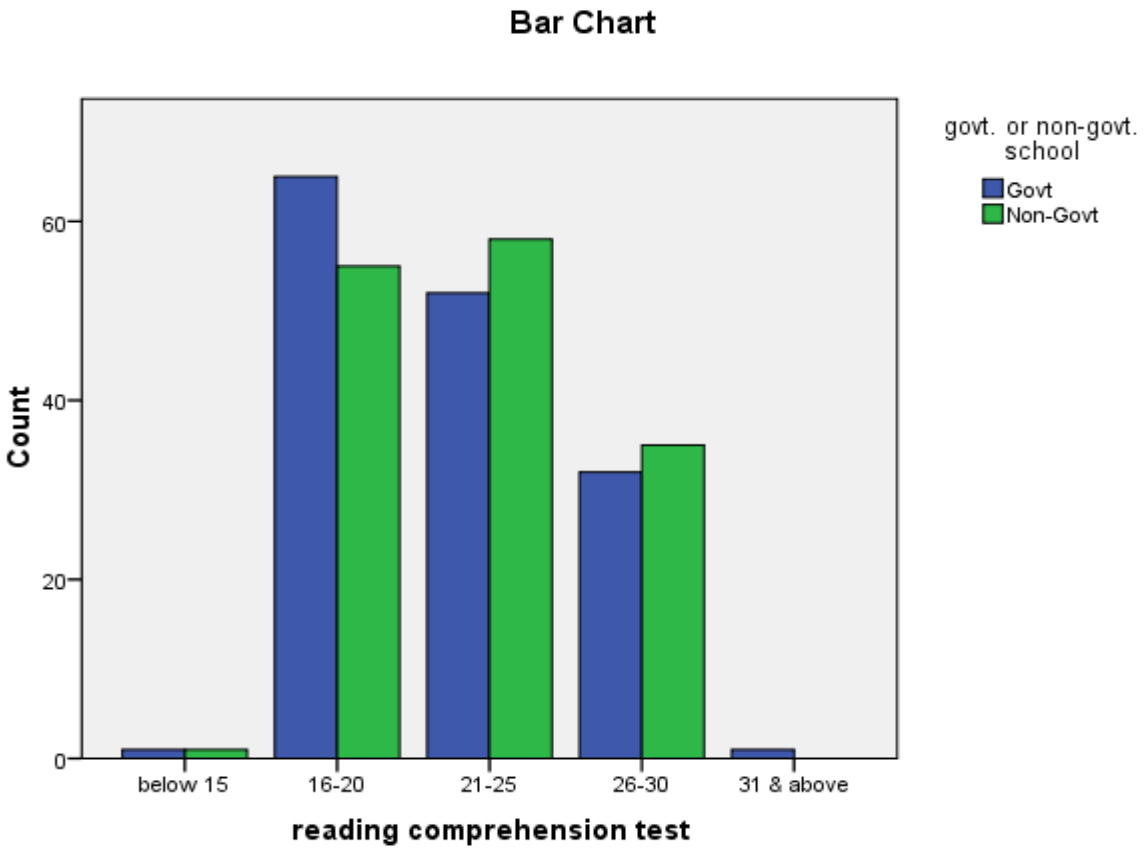

Fig: 3.4. Comparison between government and non-government school according to reading comprehension factor

The stated figure is clearly shown the variance of reading comprehension between and non-government schools. Though government students' score is high for 16 to 20 ranges but non-government students' score is high for higher ranges which are 21 to 30.

Table 3.5. Independent Samples T-Test (according to top and bottom students)

Variable category	Roll no	Mean	t	Sig.
Block Design	Top ten	39.90	23.594	.000*
	Bottom ten	24.78		
Similarities	Top ten	13.32	-1.035	.302
	Bottom ten	13.60		
Digit Span	Top ten	15.46	12.267	.000*
	Bottom ten	11.80		
Picture Concept	Top ten	12.41	12.715	.000*
	Bottom ten	9.81		
Coding	Top ten	100.81	44.293	.000*
	Bottom ten	78.30		
Vocabulary	Top ten	46.21	-4.158	.000*
	Bottom ten	47.87		
Letter-Number Sequence	Top ten	15.47	17.369	.000*
	Bottom ten	11.83		
Matrix Reasoning	Top ten	14.01	16.382	.000*
	Bottom ten	9.77		
Symbol Search	Top ten	45.14	26.068	.000*
	Bottom ten	35.32		
Reading Comprehension	Top ten	21.70	-3.377	.001*
	Bottom ten	23.34		

Table 3.5. represents the variance between top and bottom students. To investigate whether the scores vary according to class role, t-test was conducted. As can be seen in the Table 3.10, top students' score is significantly differ from bottom students' in most of the subtests' (block design, digit span, picture concept, coding, letter-number sequence, matrix reasoning, symbol search) score except similarities which is part of verbal comprehension subtest.

Table 3.6. Independent Samples T-Test (according to sex)

Variable category	Sex	Mean	t	Sig.
Block Design	Male	31.93	-.667	.506
	Female	32.65		
Similarities	Male	13.42	-.346	.730
	Female	13.51		
Digit Span	Male	13.54	-.506	.613
	Female	13.70		
Picture Concept	Male	10.87	-1.788	.075
	Female	11.32		
Coding	Male	89.03	-.634	.527
	Female	89.92		
Vocabulary	Male	46.94	-.521	.603
	Female	47.15		
Letter-Number Sequence	Male	13.56	-.487	.626
	Female	13.71		
Matrix Reasoning	Male	11.62	-1.451	.148
	Female	12.13		
Symbol Search	Male	39.67	-1.547	.123
	Female	40.72		
Reading Comprehension	Male	22.38	-.593	.554
	Female	22.67		

Table 3.6. presents the variance as well as significant relationship among these results according to the sex of the school students. To scrutinize whether scores vary by sex, t-test was conducted. It is revealed that there is no significant difference between male and female students.

3.4. Correlation (according to reading comprehension, cognitive factors, types of schools, students' roll and sex)

Table 3.7. Correlation between reading comprehension and types of schools

Correlations

		govt. or non-govt. school	reading comprehension test
govt. or non-govt. school	Pearson Correlation	1	.038
	Sig. (2-tailed)		.514
	N	300	300
reading comprehension test	Pearson Correlation	.038	1
	Sig. (2-tailed)	.514	
	N	300	300

Table 3.8. Correlation between reading comprehension and students' roll

Correlations

		roll no	reading comprehension test
roll no	Pearson Correlation	1	.231**
	Sig. (2-tailed)		.000
	N	300	300
reading comprehension test	Pearson Correlation	.231**	1
	Sig. (2-tailed)	.000	
	N	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3.9. Correlation between reading comprehension and students' sex

Correlations

		reading comprehension test	sex
reading comprehension test	Pearson Correlation	1	-.097
	Sig. (2-tailed)		.095
	N	300	300

sex	Pearson Correlation	-.097	1
	Sig. (2-tailed)	.095	
	N	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3.7, 3.8 and 3.9 presents the correlation between reading comprehension and other factors (types of schools, students' roll and sex). As can be seen, reading comprehension is significantly correlated with students' roll and positively correlated with types of school but there have no significant correlation with students' sex.

Table 3.10. Correlation between cognitive factors and types of schools

Correlations

		WISC IV test	govt. or non-govt. school
WISC IV test	Pearson Correlation	1	.051
	Sig. (2-tailed)		.376
	N	300	300
govt. or non-govt. school	Pearson Correlation	.051	1
	Sig. (2-tailed)	.376	
	N	300	300

Table 3.11. Correlation between cognitive factors and students' roll

Correlations

		WISC IV test	roll no
WISC IV test	Pearson Correlation	1	-.302**
	Sig. (2-tailed)		.000
	N	300	300
roll no	Pearson Correlation	-.302**	1
	Sig. (2-tailed)	.000	
	N	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3.12. Correlation between cognitive factors and students' sex

Correlations

		WISC IV test	sex
WISC IV test	Pearson Correlation	1	-.040
	Sig. (2-tailed)		.491
	N	300	300
sex	Pearson Correlation	-.040	1
	Sig. (2-tailed)	.491	
	N	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3.10, 3.11 and 3.12 presents the correlation between cognitive factors with other areas (types of schools, students' roll and sex). As can be seen, cognitive factors is significantly correlated with students' roll and positively correlated with types of school but there have no significant correlation with students' sex.

Table 3.13. Correlation between reading comprehension and cognitive factors

Correlations

		WISC IV test	reading comprehension test
WISC IV test	Pearson Correlation	1	-.087
	Sig. (2-tailed)		.132
	N	300	300
reading comprehension test	Pearson Correlation	-.087	1
	Sig. (2-tailed)	.132	
	N	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3.13 presents the correlation between reading comprehension and cognitive factors. As can be seen, reading comprehension is negatively correlated with cognitive factors and there have no significant correlation between them.

3.5. Impact of cognitive factors on reading comprehension

In the present study, linear multiple regressions were calculated to investigate the impact of various cognitive factors like VCI (similarities, vocabulary), WMI (digit span, letter-number sequence), PRI (block design, picture concept, matrix reasoning) and PSI (coding, symbol search) on reading comprehension among the students' inserting reading comprehension as dependent variable and other cognitive factors separately as independent variables. Regression coefficient β tell us how much of a change we could make in the dependent variables by making a one unit of change in the independent variables while keeping all other variable constant. The standardized beta (β) indicated that various cognitive factors can be the predictors of reading comprehension.

Table 3.14. Regression Table of reading comprehension and cognitive factors (Verbal Comprehension Index)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Raw score_VC, Raw score_SI[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: reading comprehension test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.076[a]	.006	.000	.795

a. Predictors: (Constant), Raw score_VC, Raw score_SI

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.082	2	.541	.855	.426[a]
	Residual	187.835	297	.632		
	Total	188.917	299			

a. Predictors: (Constant), Raw score_VC, Raw score_SI

b. Dependent Variable: reading comprehension test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.020	.643		3.144	.002
	Raw score_SI	.000	.020	-.001	-.022	.983
	Raw score_VC	.017	.013	.076	1.301	.194

a. Dependent Variable: reading comprehension test

Table 3.15. Selected statistics from Regression of reading comprehension and cognitive factors (VCI)

Independent Variable	β	t	R^2	F	Sig.
Similarities (test score)	-.001	-.022	.006	.855	.983
Vocabulary (test score)	.076	1.301			.194

Dependent Variable: reading comprehension test score

In the above table, β= -.001 indicate negative change in the scores of reading comprehension which is accounted by the variance in the score of similarities. But for the score in, β=.076 shows the positive increase in the score of reading comprehension that is accounted by the score of vocabulary. t value also giving the same indication like β. From the value of $R^{2=}$.006, we can say that only 6% variation of reading comprehension can be explained by variance in the score of VCI (similarities and vocabulary). Among the two dependent variables (similarities and vocabulary); the changing pattern is not significant with reading comprehension.

Table 3.16. Regression Table of reading comprehension and cognitive factors (Perceptual Reasoning Index)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Raw score_MR, Raw score_PCn, Raw score_BD[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: reading comprehension test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.165[a]	.027	.017	.788

a. Predictors: (Constant), Raw score_MR, Raw score_PCn, Raw score_BD

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.152	3	1.717	2.766	.042[a]
	Residual	183.764	296	.621		
	Total	188.917	299			

a. Predictors: (Constant), Raw score_MR, Raw score_PCn, Raw score_BD

b. Dependent Variable: reading comprehension test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.233	.240		13.463	.000
	Raw score_BD	-.015	.007	-.181	-2.212	.028
	Raw score_PCn	.000	.028	-.003	-.035	.972
	Raw score_MR	.008	.021	.029	.368	.713

a. Dependent Variable: reading comprehension test

Table 3.17. Selected statistics from Regression of reading comprehension and cognitive factors (PRI)

Independent Variable	β	t	R^2	F	Sig.
Block Design (test score)	-.181	-2.212	.027	2.766	.028
Picture Concept (test score)	-.003	-.035			.972
Matrix Reasoning (test score)	.029	.368			.713

Dependent Variable: reading comprehension test score

In the above table, β= -.181 and -.003 indicate negative change in the scores of reading comprehension which is block design and picture concept. But for the score in, β=.029 shows the positive increase of reading comprehension score that is accounted by the variance in the score of matrix reasoning. t value also give the same indication like β. From the value of $R^{2=}$.027, we can say that only 3% variation of reading comprehension can be explained by the variance in PRI (block design, picture concept and matrix reasoning). Among the three dependent variables; the changing pattern is significant only for reading comprehension and block design.

Table 3.18. Regression Table of reading comprehension and cognitive factors (Working Memory Index)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Raw score_LN, Raw score_DS[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: reading comprehension test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.115[a]	.013	.007	.792

a. Predictors: (Constant), Raw score_LN, Raw score_DS

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.485	2	1.243	1.980	.140[a]
	Residual	186.431	297	.628		
	Total	188.917	299			

a. Predictors: (Constant), Raw score_LN, Raw score_DS

b. Dependent Variable: reading comprehension test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.288	.247		13.288	.000
	Raw score_DS	.033	.093	.107	.354	.724
	Raw score_LN	-.067	.094	-.218	-.720	.472

a. Dependent Variable: reading comprehension test

Table 3.19. Selected statistics from Regression of reading comprehension and cognitive factors (WMI)

Independent Variable	*β*	t	R^2	F	Sig.
Digit Span (test score)	.107	.354	.013	1.980	.724
Letter-Number Sequence (test score)	-.218	-.720			.472

Dependent Variable: reading comprehension test score

In the above table, β= .107 indicate positive change in the scores of reading comprehension that is accounted by the score of digit span. But for the score in letter-number sequence, β=-.218 shows the negative change with reading comprehension for which letter-number sequence score is accountable. t value also giving the same indication like β that means between digit span and reading comprehension; though the difference is positive but that is not significant. But in case of letter-number sequence and reading comprehension; the difference is negative which is also not significant. From the value of $R^{2=}$.013, we can say that only 1% variation of reading comprehension can be explained by the variance in WMI. Among the two dependent variables (digit span and letter-number sequence); the changing pattern is not significant with reading comprehension.

Table 3.20. Regression Table of reading comprehension and cognitive factors (Processing Speed Index)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Raw score_SS, Raw score_CD[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: reading comprehension test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.150[a]	.023	.016	.789

a. Predictors: (Constant), Raw score_SS, Raw score_CD

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.259	2	2.129	3.425	.034[a]
	Residual	184.658	297	.622		
	Total	188.917	299			

a. Predictors: (Constant), Raw score_SS, Raw score_CD

b. Dependent Variable: reading comprehension test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.708	.344		10.774	.000
	Raw score_CD	-.008	.007	-.126	-1.200	.231
	Raw score_SS	-.004	.014	-.028	-.266	.790

a. Dependent Variable: reading comprehension test

Table 3.21. Selected statistics from Regression of reading comprehension and cognitive factors (PSI)

Independent Variable	*β*	t	R^2	F	Sig.
Coding (test score)	-.126	-1.200	.023	3.425	.231
Symbol Search (test score)	-.028	-.266			.790

Dependent Variable: reading comprehension test score

In the above table, β= -.126 and -.028 indicate negative change in the scores of reading comprehension that is accounted by both score of coding and symbol search. t value also giving the negative differences like β. From the value of $R^{2=}$.023, we can say that only 2% variation of reading comprehension can be explained by variance in the score of PSI. Among the two dependent variables (coding and symbol); the changing pattern is not significant with reading comprehension.

Chapter 04: Discussion

Discussion

The present study was designed to investigate the relationship between reading comprehension and cognitive factors among the students between government and non-government school in Dhaka city. Specific objectives of the current study were to identify the deviation between reading comprehension and cognitive factors among the top and bottom students of different classes in government and non-government schools. In addition, it was also expected to identify whether male and female students differ in respect of types of schools and to know whether there have any impacts of these factors on academic sectors. In order to meet those objectives 300 students of age 10 to 14 were conveniently selected from four government and non-government schools located in Dhaka city of Bangladesh. Following standardized procedure of the Bengali Version of WISC IV were administered to the students to assess reading comprehension and cognitive factors which was already developed by researcher. The study was conducted following ethical guidelines prescribed by American Psychological Association (APA) and local norm. Descriptive, t-test, correlation and some inferential statistics were applied to answer the research questions.

Results indicated that in every subtest like non-government students' average score (M and SD) is higher (though the range is not vary too much) rather than government students' score. In coding, the score is very high in both government (M=88.73, SD=12.263) and non-government (M=90.24, SD=11.929) students. In vocabulary, both students' average score is near about 50% (government M= 46.66, SD=3.462 and non-government M=47.44, SD=3.574). Now-a-days, creative parts are included in most of the subjects. In this study, ten subtests were administered which are the part of main four core subtests which are verbal comprehension subtests, processing speed, perceptual reasoning subtests and working memory subtests. A possible

explanation for such findings in the current study found between government and non-government school students (as measured by Bengali Version of WISC IV) may be the students' lowered vocabulary knowledge caused by lack of reading, reading decoding problems, or lessened reading knowledge growth. The government students may have been socially and linguistically diverse. This cultural difference may have been affected their scores in a myriad of ways.

In comparison between top and bottom students among four government and non-government schools, the results showed statistically significant difference between top and bottom students in most of the subtests like perceptual reasoning, working memory and processing speed but in case of verbal comprehension i.e. reading comprehension (top students M=21.70, SD=4.136; bottom students M=23.34, SD=4.272), similarities (top students M=13.32, SD=2.425; bottom students M=13.60, SD=2.269) and vocabulary(top students M=46.21, SD=2.511; bottom students M=47.87, SD=4.161); bottom students' score is more than top students. Numerous researchers agree that lessened word knowledge and impoverished reading experience may lower reading comprehension of top students. Another possibility may be a shortage in the total fund of information usually obtained through reading (Wechsler, 2003b). Top students' mean reading comprehension scores may have been lower because of lack of knowledge, misinterpretation, or incomplete context elaboration. The students may have difficulty with the surface order of the presentation, the propositional organizational text base, or the situation of the text base (Block & Pressley, 2002).

There was also significant difference according to sex among the students. Female students' scores are much more than male scores in most of the subtests for all classes which is found in

both government and non-government schools. In coding, the score is very high in both male (M=89.03, SD=12.135) and female (M=89.92, SD=12.093) students. In vocabulary, both students' average score is near about 50% (male students' M= 46.94, SD=3.585 and female students' M=47.15, SD=3.492). Now-a-days, creative parts are included in most of the subjects. In this study, ten subtests were administered which are the part of main four core subtests which are verbal comprehension subtests, processing speed, perceptual reasoning subtests and working memory subtests. Some of the reasons for this study's lower reading comprehension mean standard score in male students may possibly be found in Schema, Mental Model, and Proposition Reading Theories. Schema and Mental Model Theory suggests that individuals who read and interpret the same text end up with different understandings because of differences in prior knowledge brought by the reader to the text (Block & Pressley, 2002).

Wechsler (2003a) finds a correlation between reading comprehension and full-scale intelligence. The current study's findings appear to support previous studies regarding the correlation between reading comprehension and cognitive factors. The present study suggests that verbal comprehension is significantly correlated with reading comprehension. The results of the correlation analyses of the relationship between reading comprehension and cognitive factors (block design, similarities, digit span, picture concept, coding, vocabulary, letter-number sequence, matrix reasoning, and symbol search) assessed by WISC-IV, suggested that there is a statistically significant negative correlation between reading comprehension and other cognitive factors which are perceptual reasoning (block design, picture concept, matrix reasoning), processing speed (coding, symbol search) and working memory (digit span, letter-number sequence). As can be seen, reading comprehension is positively correlated with verbal comprehension (similarities, vocabulary). A possible explanation for the correlation findings in

the current study which found between reading comprehension and cognitive factors; may be the students' lowered vocabulary knowledge caused by lack of reading, reading decoding problems, or lessened reading knowledge growth. Intelligence and reading comprehension may appear to decrease in upper elementary because of slow growth in vocabulary resulting from impoverished reading experience (Torgensen, 2000; Badian, 1999). This area has implications for future research, changes in assessment methods, and information regarding relationships between reading comprehension and cognitive factors.

The study also investigates the potential impact of cognitive factors (VCI, PRI, WMI, PSI) that is highly correlated with reading comprehension. The result showed not all forms of cognitive factors were found to have significant impact on reading comprehension. To explore the result, linear multiple regressions were calculated to investigate the impact of various cognitive factors like VCI (similarities, vocabulary), WMI (digit span, letter-number sequence), PRI (block design, picture concept, matrix reasoning) and PSI (coding, symbol search) on reading comprehension among the students' inserting reading comprehension as dependent variable and other cognitive factors separately as independent variables. Tables 3.14-3.15 indicate that for VCI ($R^{2=}$ .006); similarities (β=-.001) is strongly and negatively but vocabulary (β=.076) is positively associated with reading comprehension. For PRI ($R^{2=}$ .027); tables 3.16-3.17 indicate that block design (β=-.181) and picture concept (β=-.003) is strongly and negatively but matrix reasoning (β=.029) is positively associated with reading comprehension. The tables also indicate that block design is significant predictor of reading comprehension. Tables 3.18-3.19 indicate that for WMI ($R^{2=}$ .013); though letter number sequence (β=-.218) is strongly and negatively associated but digit span (β=.107) is positively associated with reading comprehension. Tables 3.20-3.21 indicate that for PSI ($R^{2=}$ .023); both coding (β=-.126) and symbol search (β=-.028)

are strongly and negatively associated with reading comprehension.

The result is particularly important as indicates other cognitive factors which are highly correlated with reading comprehension rather than these cognitive factors if other factors remain constant. All of these findings indicate, although minimal but still there have alarming connection between reading comprehension and cognitive factors. Lack of verbal comprehension may influence reading comprehension and ultimately intelligence (Torgensen, 2000). Shaywitz (2003) states that the direction of the relationship between reading comprehension and vocabulary comprehension is not clearly understood, but it is a reciprocal relationship. The current study does not document a reciprocal relationship between reading comprehension and verbal comprehension, but does indicate that reading comprehension (as measured by the WISC-IV VCI) critically impacts verbal comprehension.

4.1. Recommendations

This study is unique as it investigates top students reading comprehension difficulties. However, studies of students with reading comprehension difficulties are scarce or nonexistent. As teachers play a vital role for child development; a better understanding of the students' performance which is highly correlated with reading comprehension and cognitive factors; would benefit researchers, child psychologist, counselors, teachers and mental health professionals working in the field of child and adolescent development.

Similarly, this study would be helpful for understanding teacher's appropriate evaluation which is necessary for better cognitive development for their students. Furthermore, the understanding of how cognitive factors are related with the students' performance might help us to formulate positive teaching strategies to promote healthy mental life of the students.

Educational psychologists and child psychologists could incorporate these findings with their practice especially when they are working with parents and teachers. They can organize workshops, seminars, group meeting to sensitize parents and teachers on the individual differences of the learners.

Teachers especially those who assess students based on only academic performance rather than focus on everyone's inner potentiality need to be taken under special targeted programs to reduce judgmental attitude. On the other hand, students also need to focus for effective programs which support them to overcome their deficiencies in order to achieve those abilities to show their expected performance according to their level best.

There are lots of schools who presently are doing everything possible to create successful readers since third grade. Early childhood educators can be trained through courses in reading and additional training programs to detect students' with possible reading comprehension difficulties in early age.

For Teachers and Parents: Though often the first person to spot a problem with reading is the teacher but sometimes it may be a parent who voices the concern that his/her child can "call" the words when reading but does not understand what he is reading. The teacher or parents may check the student by asking to describe the main character, sequence of events, and essential concepts in a story read orally to the child. The parent or teacher may also question the student concerning what the story is depicting, the organizational main ideas, and understanding of words or ideas in the story.

4.2. Directions for Future Research

The possibilities for future research are vast, as this small study has only scratched the surface of the problem. The advantage of the study is the timeliness. Students with reading comprehension difficulties have serious lifelong problems that require better methods of assessment created by future research include examining the relationship between intelligence variables, partitioning, scale scores and specific reading comprehension subgroups.

Educators and researchers are always looking for new ideas for assessment of learners who have various difficulties. This study presents empirical based assessment instructional implications and recommendations for students with reading comprehension difficulties.

Since, prevention is better than remedy, Ministry of Education and Ministry of Law along with all other concerned bodies should start strong advocacy campaign so that every learner is individual and everyone has the potentiality to prove to do something unique. In a consequence, we will able to contribute the future national developmental process by reducing drop out at school level from Bangladesh.

4.3. Limitations

Although the present study tried to maintain a sound methodology and analysis of data, nerveless it is not free from certain draw backs and limitations which need to be considered. Following may be said to be the major limitations of the study;

1. Data was collected conveniently. There was no randomization in sampling, therefore lack in generation.
2. The number of respondent was small.

3. In reality, many of the students may have included who have reading comprehension difficulties. If this study administered on much more respondents from all over the country, there might have been different findings.
4. Due to shortage of time and lack of financial and other support data was collected from only Dhaka city. Thus it cannot be claimed that the sample was representative.
5. The study design was co relational therefore did not demonstrate the casual relation and tried to show the relationship among variables.
6. The study could not control some of the extraneous variable like socioeconomic condition, number of siblings and others which could affect the result of the study.

   Nevertheless the findings of the present study are interesting and may contribute to develop insight in teachers, parents, students and other resources related to improve and motivate their mind to stop doing category students only based on the academic performance rather than realize the individual difference as every student have unique potentiality to reach his/her level best. Again, the use of the ideas discussed in this study might help prevent these problems in future research studies.

4.4. Conclusion

In conclusion, it can be said that proper teaching strategies, sufficient care, support and guideline can help learners to enrich their cognitive development area. Teachers provide the most immediate and important environment where students can develop their full capacities in these domain. Teachers have key responsibilities like parents to ensure students' fundamental rights. This study provides theoretical band empirical evidence of the contribution of reading comprehension and cognitive factors in students' life.

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Appendix

1. Demographic information collection format
2. Wechsler Intelligence scale for children – Fourth Edition (WISC-IV) Questionnaire
3. Statistical analysis sheet

Appendix 1

আমি ঢাকা বিশ্ববিদ্যালয়ের ‖kÿv মনোবিজ্ঞান বিভাগের এম.‖dj . ২০০9-২০১0 এর একজন শিক্ষার্থী । আমি আমার পাঠ্যক্রমের অংশ হিসেবে থিসিস করছি। এ উদ্দেশ্যে আমি e¨‖³MZ Z_¨‖ejx I মনোবৈজ্ঞানিক প্রশ্নমালা ব্যবহার করছি। প্রশ্নমালাগুলোর প্রতিটি বিবৃতি মনোযোগ সহকারে পড়‡Z n‡e এবং প্রদত্ত নির্দেশনা অনুযায়ী প্রতিটি বিবৃতির পাশে নির্দিষ্ট ঘরে উত্তর চিহ্নিত কর‡Z n‡e। উত্তরের গোপনীয়তা রক্ষা করা হবে এবং শুধুমাত্র একাডেমিক বা গবেষণা কাজেই Z‖ ব্যবহৃত হবে। কাজেই অকপটে প্রতিটি প্রশ্নের উত্তর ‡দqv‖i Abÿi‖a R‖b‖‡b‖ n‡”Q।

e¨w³MZ Z_¨vejx

AvBwW bs: bvg :

বয়স: wj½ : ছেলে ☐ মেয়ে ☐

†kYx : ‡ivj bs:

we`¨vj‡qi bvg :

we`¨vj‡qi aiY : miKvix ☐ †emiKvix ☐

পিতার wkÿvMZ †hvM¨Zv :_____ পিতার পেশা:_____

gvতার wkÿvMZ †hvM¨Zv :_____gvতার পেশা:_____

cwievi cKwZ: Mvg:☐ kni: ☐

cwiewiK gwmK Avq:

cwievi aiY: †hš_: GKK: ☐

Rb¥Kvjxb RwUjZv:

fvB-‡ev‡bi msL¨v: GKgvÎ☐ 2 Rb☐ 3 Rb☐ 4 Rb ☐ 5 Rb A_ev Z‡ZwaK ☐

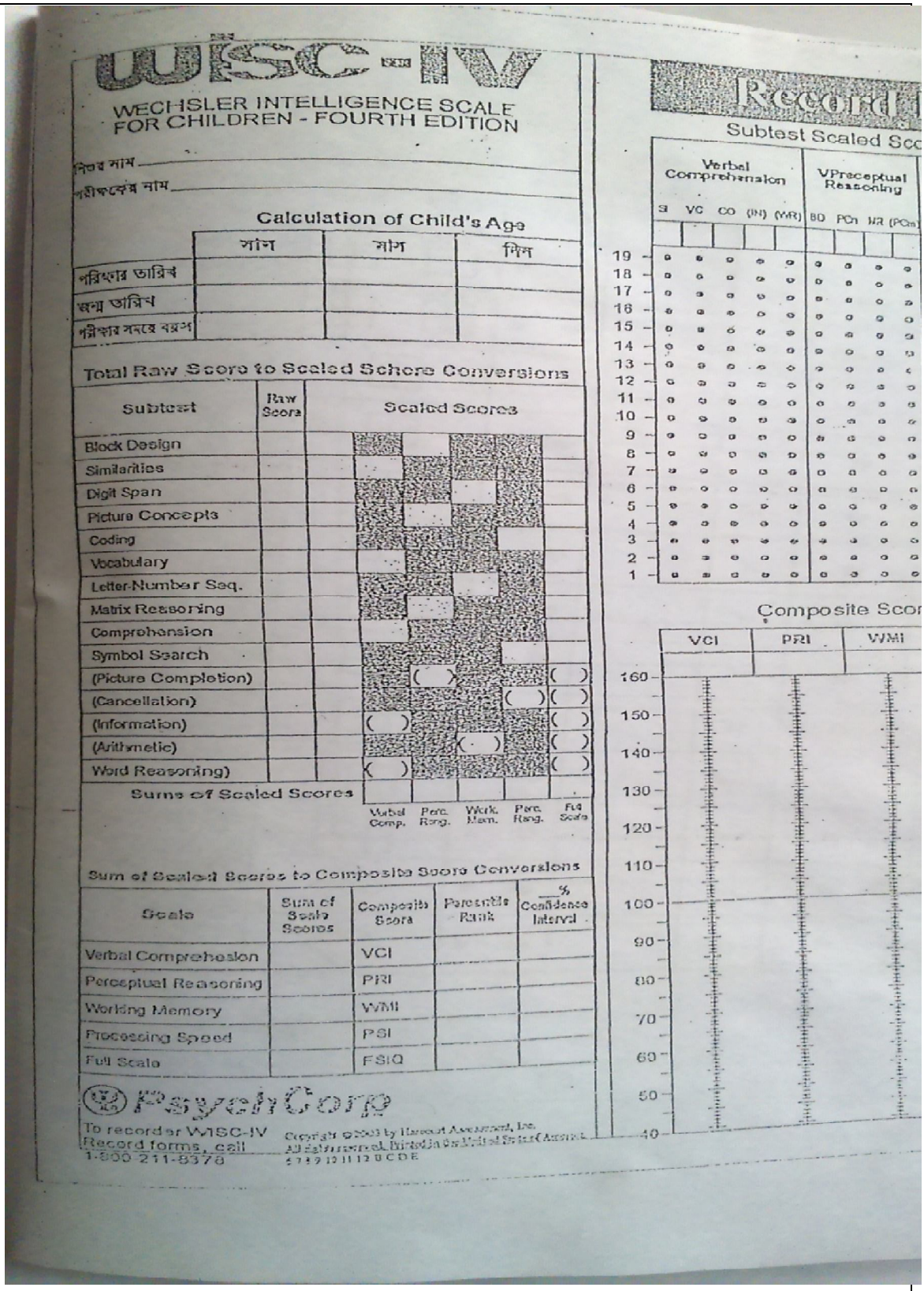
fvB-‡ev‡bi g‡a¨ wb‡Ri Ae¯vb: eo ☐ ga¨g ☐ †mR ☐

Kwbô ☐ GKgvÎ ☐ Ab¨vb¨ ☐

weMZ `ßi eQ‡ii mvgwqK cixÿvi djvdj: †gvU b¤i:

cvß b¤i:

Appendix 2



WISC-IV

WECHSLER INTELLIGENCE SCALE FOR CHILDREN - FOURTH EDITION

শিশুর নাম

পরীক্ষকের নাম

Calculation of Child's Age

	সাল	মাস	দিন
পরিক্ষার তারিখ			
জন্ম তারিখ			
পরীক্ষার সময়ে বয়স			

Total Raw Score to Scaled Score Conversions

Subtest	Raw Score	Scaled Scores
Block Design		
Similarities		
Digit Span		
Picture Concepts		
Coding		
Vocabulary		
Letter-Number Seq.		
Matrix Reasoning		
Comprehension		
Symbol Search		
(Picture Completion)		( ) ( )
(Cancellation)		( ) ( )
(Information)		( ) ( )
(Arithmetic)		( ) ( )
Word Reasoning)		( ) ( )

Sums of Scaled Scores

Verbal Comp.	Perc. Reas.	Work. Mem.	Perc. Reas.	Full Scale

Sum of Scaled Scores to Composite Score Conversions

Scale	Sum of Scale Scores	Composite Score	Percentile Rank	% Confidence Interval
Verbal Comprehension		VCI		
Perceptual Reasoning		PRI		
Working Memory		WMI		
Processing Speed		PSI		
Full Scale		FSIQ		

PsychCorp

To recorder WISC-IV Record forms, call 1-800-211-8378

Record

Subtest Scaled Sc

Verbal Comprehension: SI VC CO (IN) (AR)

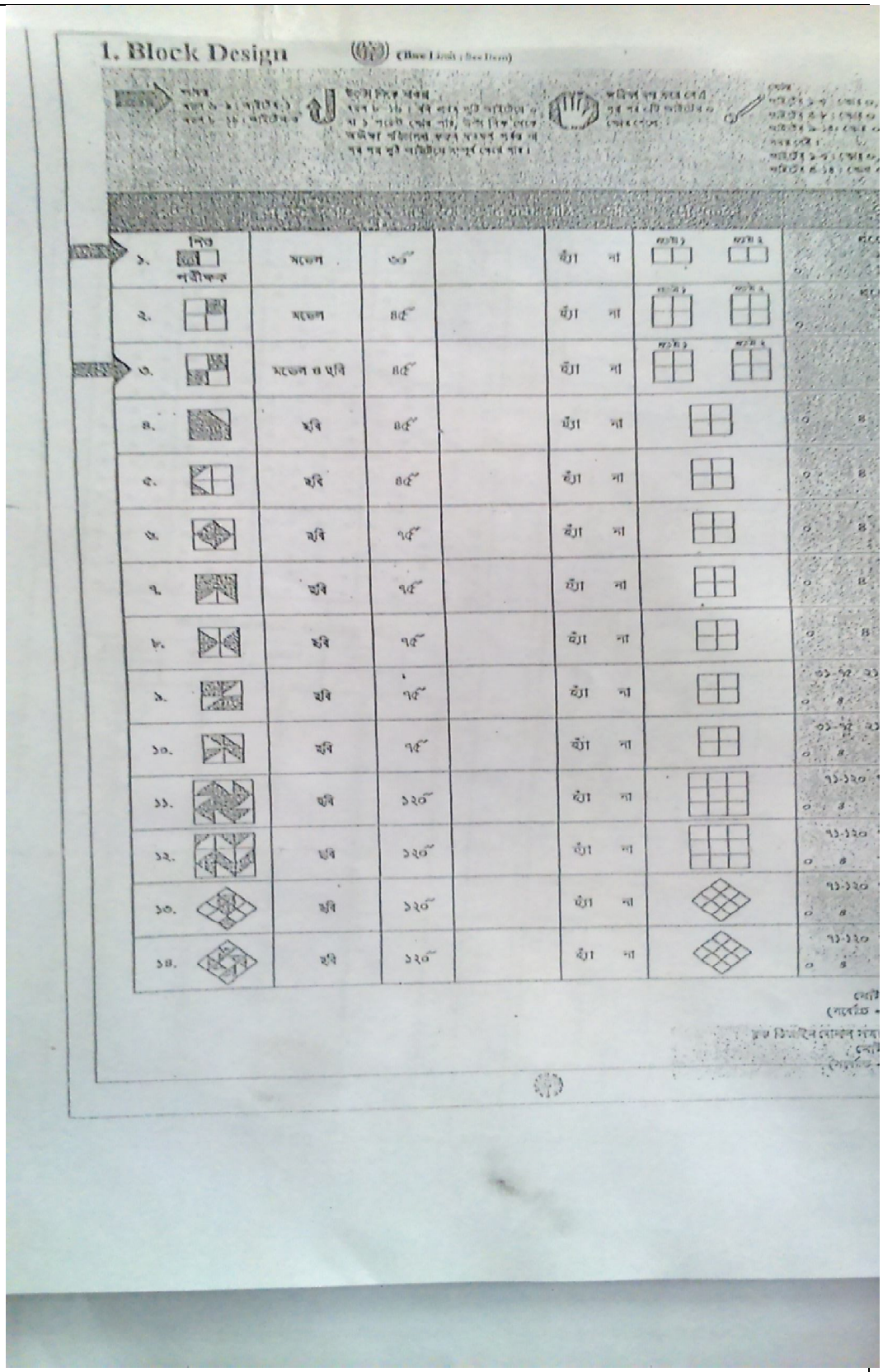
Perceptual Reasoning: BD PCn MR (PCm)

19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Composite Scor

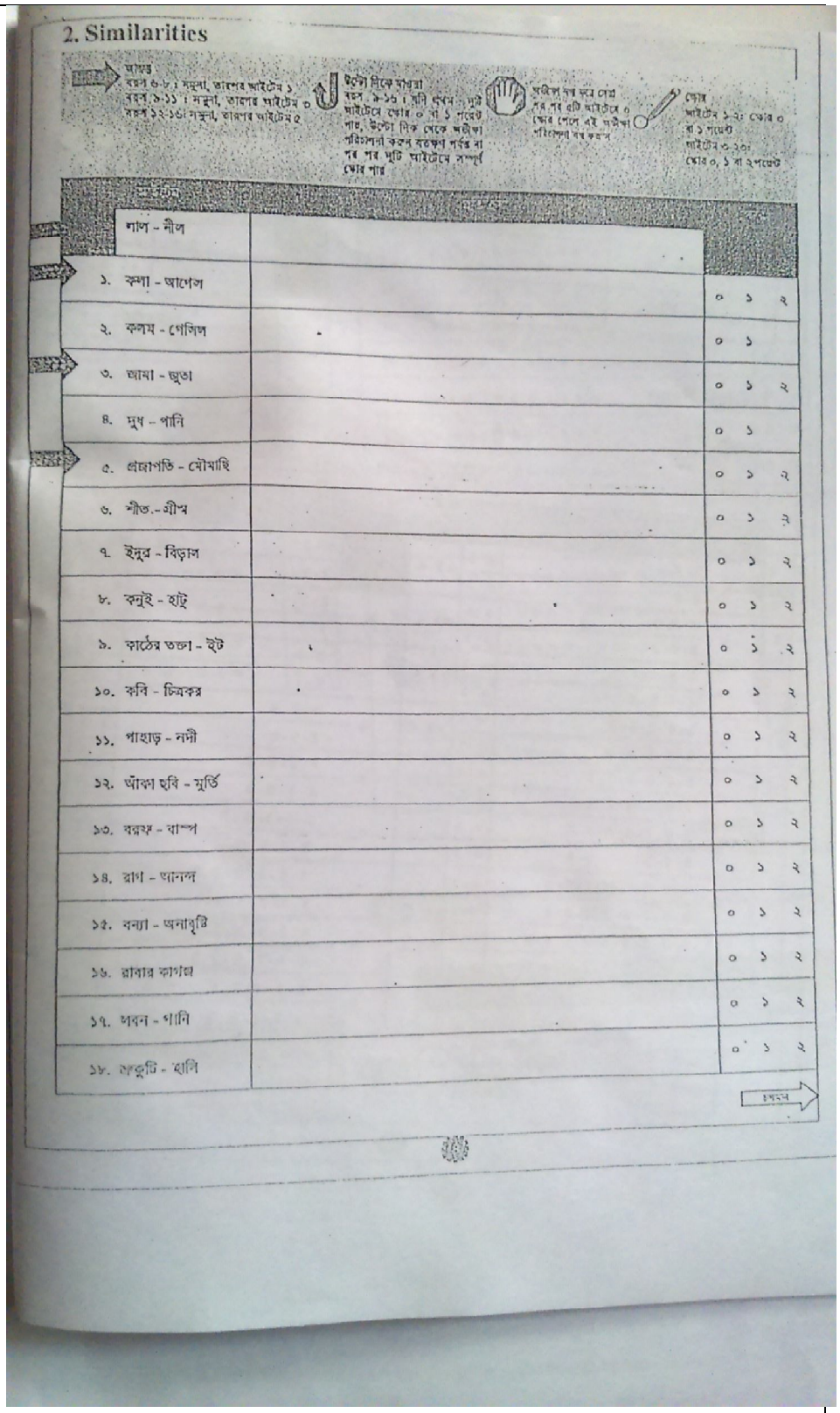
VCI PRI WMI

160 150 140 130 120 110 100 90 80 70 60 50 40



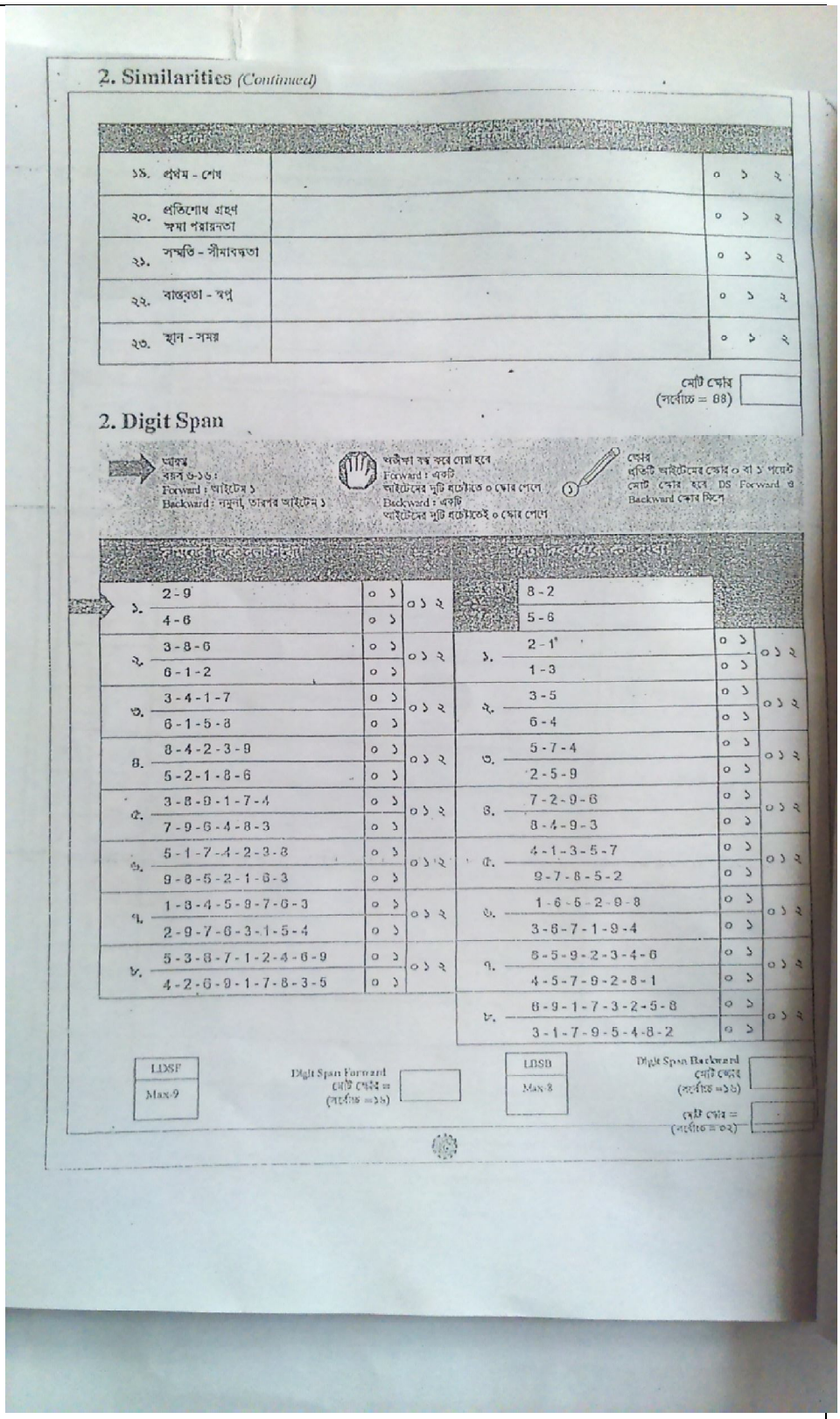
1. Block Design

১.	মডেল	৬০°		হ্যাঁ	না	
২.	মডেল	৪৫°		হ্যাঁ	না	
৩.	মডেল ও ছবি	৪৫°		হ্যাঁ	না	
৪.	ছবি	৪৫°		হ্যাঁ	না	
৫.	ছবি	৪৫°		হ্যাঁ	না	
৬.	ছবি	৭৫°		হ্যাঁ	না	
৭.	ছবি	৭৫°		হ্যাঁ	না	
৮.	ছবি	৭৫°		হ্যাঁ	না	
৯.	ছবি	৭৫°		হ্যাঁ	না	
১০.	ছবি	৭৫°		হ্যাঁ	না	
১১.	ছবি	১২০°		হ্যাঁ	না	
১২.	ছবি	১২০°		হ্যাঁ	না	
১৩.	ছবি	১২০°		হ্যাঁ	না	
১৪.	ছবি	১২০°		হ্যাঁ	না	



2. Similarities

নাশ - নীল		
১. কলা - আপেল		০ ১ ২
২. কলম - পেন্সিল		০ ১
৩. জামা - জুতা		০ ১ ২
৪. দুধ - পানি		০ ১
৫. প্রজাপতি - মৌমাছি		০ ১ ২
৬. শীত - গ্রীষ্ম		০ ১ ২
৭. ইঁদুর - বিড়াল		০ ১ ২
৮. কনুই - হাটু		০ ১ ২
৯. কাঠের তক্তা - ইট		০ ১ ২
১০. কবি - চিত্রকর		০ ১ ২
১১. পাহাড় - নদী		০ ১ ২
১২. আঁকা ছবি - মূর্তি		০ ১ ২
১৩. বরফ - বাষ্প		০ ১ ২
১৪. রাগ - আনন্দ		০ ১ ২
১৫. বন্যা - অনাবৃষ্টি		০ ১ ২
১৬. রাবার কাগজ		০ ১ ২
১৭. পবন - পানি		০ ১ ২
১৮. ফড়িং - হাতি		০ ১ ২



2. Similarities *(Continued)*

১৯. প্রথম - শেষ		০ ১ ২
২০. প্রতিশোধ গ্রহণ ক্ষমা পরায়নতা		০ ১ ২
২১. সম্মতি - সীমাবদ্ধতা		০ ১ ২
২২. বাস্তবতা - স্বপ্ন		০ ১ ২
২৩. স্থান - সময়		০ ১ ২

মোট স্কোর (সর্বোচ্চ = ৪৪)

2. Digit Span

ক্রমবদ্ধ বয়স ৩-১৬ : Forward : আইটেম ১ Backward : নমুনা, তারপর আইটেম ১

অভীক্ষা বন্ধ করে দেয়া হবে Forward : একটি আইটেমের দুটি ট্রায়ালে ০ স্কোর পেলে Backward : একটি আইটেমের দুটি ট্রায়ালেই ০ স্কোর পেলে

স্কোর প্রতিটি আইটেমের স্কোর ০ বা ১ পয়েন্ট মোট স্কোর হবে DS Forward ও Backward স্কোর মিলে

১.	2 - 9	০ ১	০ ১ ২		8 - 2		
	4 - 6	০ ১			5 - 6		
২.	3 - 8 - 6	০ ১	০ ১ ২	১.	2 - 1	০ ১	০ ১ ২
	6 - 1 - 2	০ ১			1 - 3	০ ১	
৩.	3 - 4 - 1 - 7	০ ১	০ ১ ২	২.	3 - 5	০ ১	০ ১ ২
	6 - 1 - 5 - 8	০ ১			6 - 4	০ ১	
৪.	8 - 4 - 2 - 3 - 9	০ ১	০ ১ ২	৩.	5 - 7 - 4	০ ১	০ ১ ২
	5 - 2 - 1 - 8 - 6	০ ১			2 - 5 - 9	০ ১	
৫.	3 - 8 - 9 - 1 - 7 - 4	০ ১	০ ১ ২	৪.	7 - 2 - 9 - 6	০ ১	০ ১ ২
	7 - 9 - 6 - 4 - 8 - 3	০ ১			8 - 4 - 9 - 3	০ ১	
৬.	5 - 1 - 7 - 4 - 2 - 3 - 8	০ ১	০ ১ ২	৫.	4 - 1 - 3 - 5 - 7	০ ১	০ ১ ২
	9 - 8 - 5 - 2 - 1 - 6 - 3	০ ১			9 - 7 - 8 - 5 - 2	০ ১	
৭.	1 - 8 - 4 - 5 - 9 - 7 - 6 - 3	০ ১	০ ১ ২	৬.	1 - 6 - 5 - 2 - 9 - 8	০ ১	০ ১ ২
	2 - 9 - 7 - 6 - 3 - 1 - 5 - 4	০ ১			3 - 8 - 7 - 1 - 9 - 4	০ ১	
৮.	5 - 3 - 8 - 7 - 1 - 2 - 4 - 6 - 9	০ ১	০ ১ ২	৭.	8 - 5 - 9 - 2 - 3 - 4 - 6	০ ১	০ ১ ২
	4 - 2 - 6 - 9 - 1 - 7 - 8 - 3 - 5	০ ১			4 - 5 - 7 - 9 - 2 - 8 - 1	০ ১	
				৮.	6 - 9 - 1 - 7 - 3 - 2 - 5 - 8	০ ১	০ ১ ২
					3 - 1 - 7 - 9 - 5 - 4 - 8 - 2	০ ১	

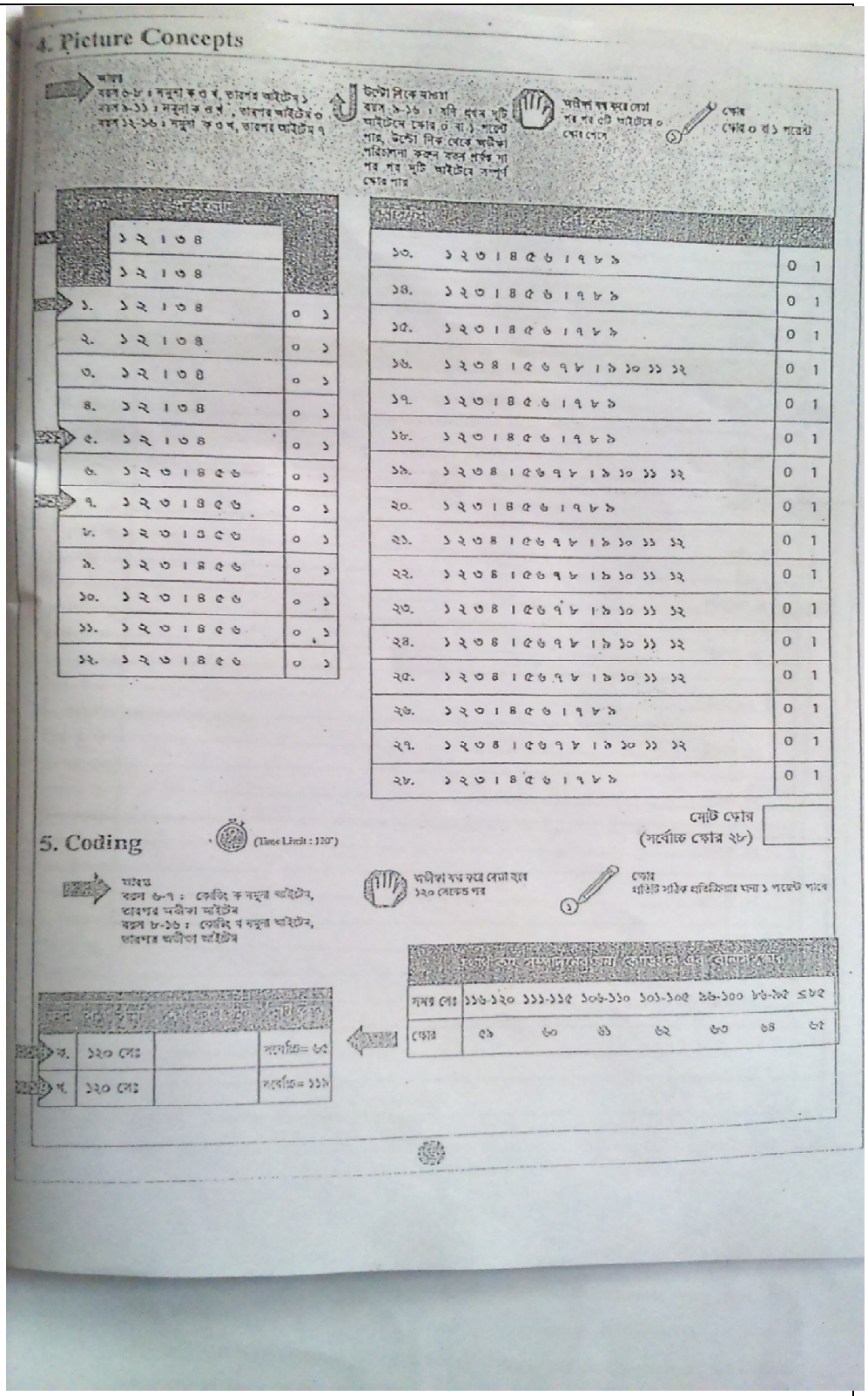
LDSF Max-9

Digit Span Forward মোট স্কোর = (সর্বোচ্চ =১৬)

LDSB Max-8

Digit Span Backward মোট স্কোর (সর্বোচ্চ =১৬)

মোট স্কোর = (সর্বোচ্চ = ৩২)



4. Picture Concepts

উদাহরণ
বক্স ৬-৮ : নমুনা ক ও খ, তারপর আইটেম ১
বক্স ৯-১১ : নমুনা ক ও খ, তারপর আইটেম ০
বক্স ১২-১৬ : নমুনা ক ও খ, তারপর আইটেম ৭

উল্টো দিকে যাওয়া
বক্স ৯-১৬ : যদি প্রথম দুটি আইটেমে স্কোর ০ বা ১ পাওয়া যায়, উল্টো দিক থেকে অভীক্ষা পরিচালনা করুন বক্স ৫টি বা তার পর পর দুটি আইটেমে সম্পূর্ণ স্কোর পায়

অভীক্ষা বন্ধ করে দেয়া হবে পর পর ৫টি আইটেমে ০ স্কোর পেলে

স্কোর
স্কোর ০ বা ১ পাবেন

	১ ২ ৩ ৪	
	১ ২ ৩ ৪	
১.	১ ২ ৩ ৪	০ ১
২.	১ ২ ৩ ৪	০ ১
৩.	১ ২ ৩ ৪	০ ১
৪.	১ ২ ৩ ৪	০ ১
৫.	১ ২ ৩ ৪	০ ১
৬.	১ ২ ৩ ৪ ৫ ৬	০ ১
৭.	১ ২ ৩ ৪ ৫ ৬	০ ১
৮.	১ ২ ৩ ৪ ৫ ৬	০ ১
৯.	১ ২ ৩ ৪ ৫ ৬	০ ১
১০.	১ ২ ৩ ৪ ৫ ৬	০ ১
১১.	১ ২ ৩ ৪ ৫ ৬	০ ১
১২.	১ ২ ৩ ৪ ৫ ৬	০ ১

১৩.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯	0 1
১৪.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯	0 1
১৫.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯	0 1
১৬.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২	0 1
১৭.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯	0 1
১৮.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯	0 1
১৯.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২	0 1
২০.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯	0 1
২১.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২	0 1
২২.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২	0 1
২৩.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২	0 1
২৪.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২	0 1
২৫.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২	0 1
২৬.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯	0 1
২৭.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২	0 1
২৮.	১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯	0 1

মোট স্কোর
(সর্বোচ্চ স্কোর ২৮)

5. Coding

(Time Limit : 120")

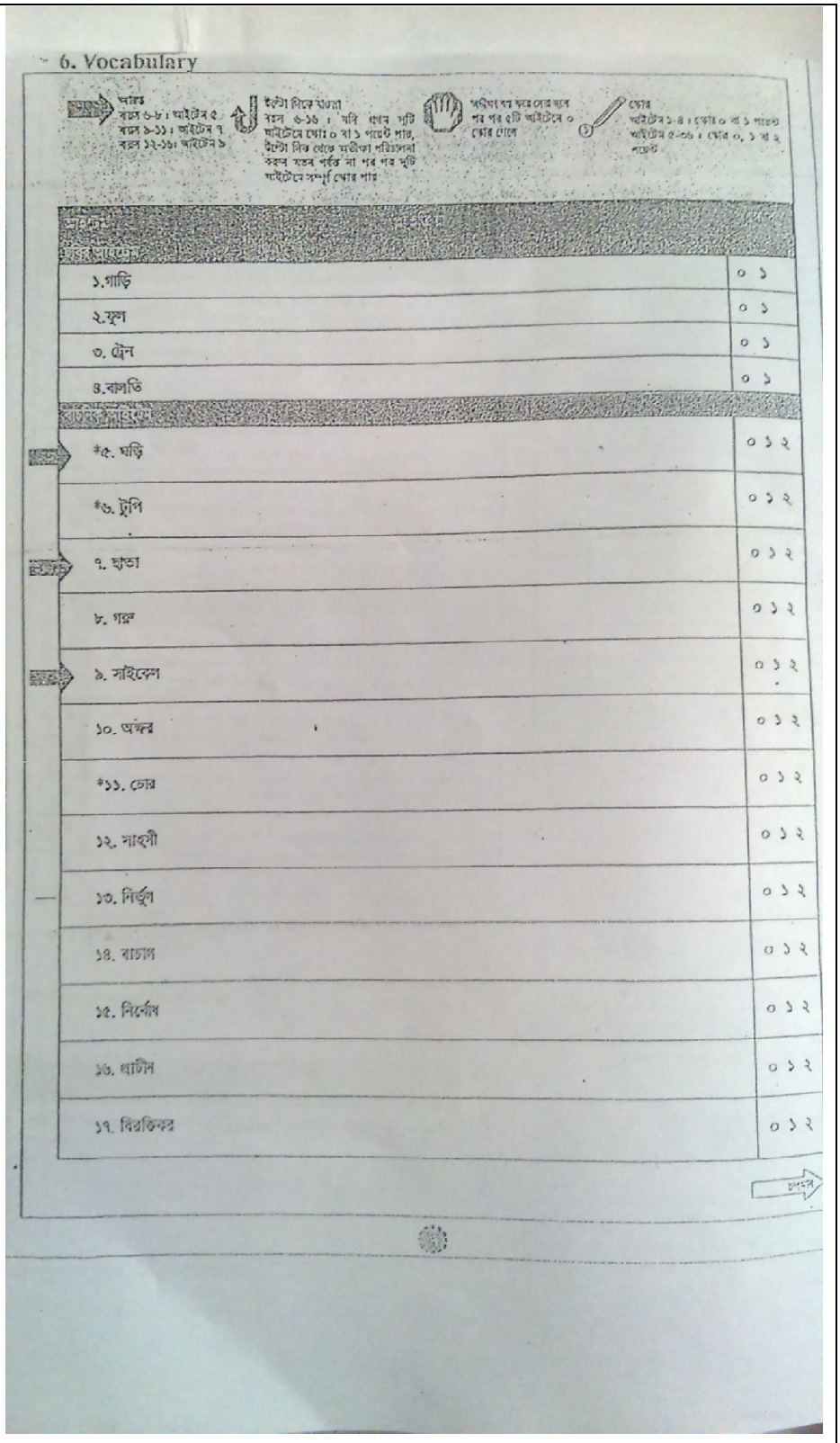
যাবতীয়
বক্স ৬-৭ : কোডিং ক নমুনা আইটেম, তারপর অভীক্ষা আইটেম
বক্স ৮-১৬ : কোডিং খ নমুনা আইটেম, তারপর অভীক্ষা আইটেম

অভীক্ষা বন্ধ করে দেয়া হবে ১২০ সেকেন্ড পর

স্কোর
প্রতিটি সঠিক প্রতিক্রিয়ার জন্য ১ পয়েন্ট পাবে

ক.	১২০ সেঃ		সর্বোচ্চ= ৬৫
খ.	১২০ সেঃ		সর্বোচ্চ= ১১৯

সময় সেঃ	১১৬-১২০	১১১-১১৫	১০৬-১১০	১০১-১০৫	৯৬-১০০	৮৬-৯৫	≤৮৫
স্কোর	৫৯	৬০	৪১	৬২	৬৩	৬৪	৬৫



6. Vocabulary

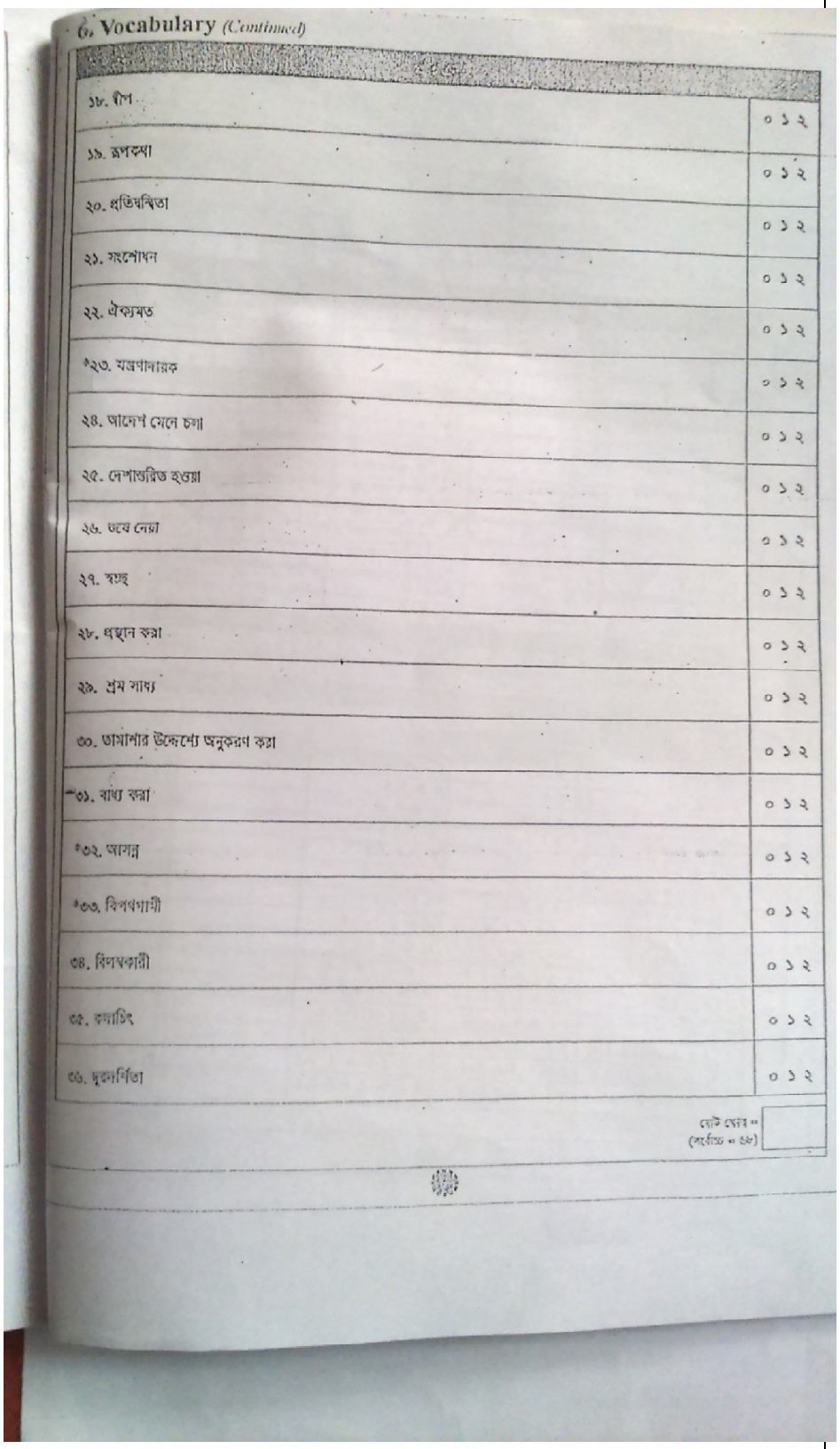
ধারক
বয়স ৬-৮। আইটেম ৫
বয়স ৯-১১। আইটেম ৭
বয়স ১২-১৬। আইটেম ১

উল্টো দিকে যাওয়া
বয়স ৬-১৬ । যদি প্রথম দুটি আইটেমে স্কোর ০ বা ১ পয়েন্ট পায়, উল্টো দিক থেকে সঠিকতা পরিচালনা করুন যতক্ষণ পর্যন্ত না পর পর দুটি আইটেমে সম্পূর্ণ স্কোর পায়

অধিকাংশ ক্ষেত্রে ব্যবহৃত
পর পর ৫টি আইটেমে ০ স্কোর পেলে

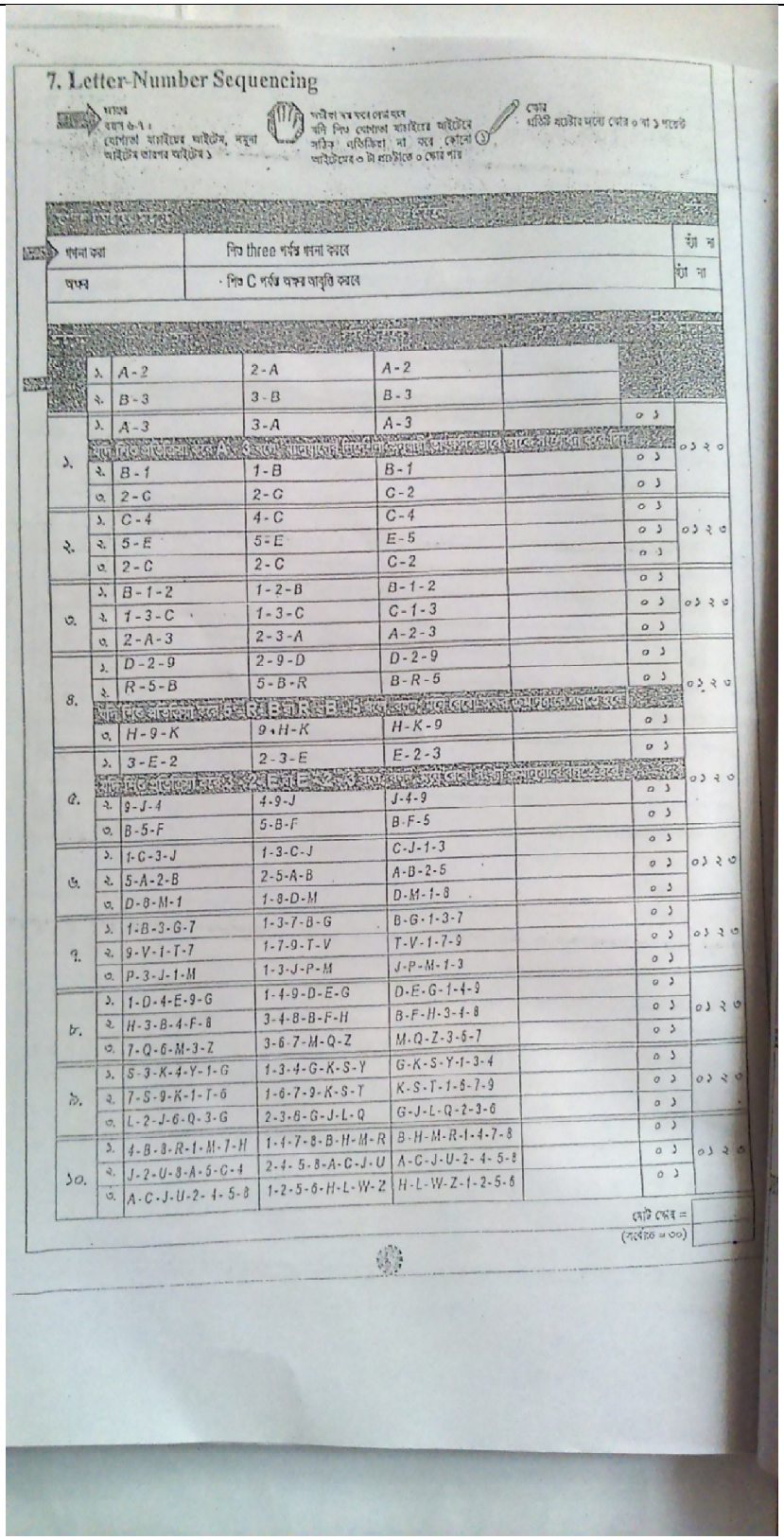
স্কোর
আইটেম ১-৪। স্কোর ০ বা ১ পয়েন্ট
আইটেম ৫-১৬। স্কোর ০, ১ বা ২ পয়েন্ট

প্রকাশ্য শব্দভাণ্ডার	
১.গাড়ি	০ ১
২.ফুল	০ ১
৩. ট্রেন	০ ১
৪.বালতি	০ ১
গাণিতিক শব্দভাণ্ডার	
*৫. ঘড়ি	০ ১ ২
*৬. টুপি	০ ১ ২
৭. ছাতা	০ ১ ২
৮. গরু	০ ১ ২
৯. সাইকেল	০ ১ ২
১০. অঙ্কুর	০ ১ ২
*১১. চোর	০ ১ ২
১২. সাহসী	০ ১ ২
১৩. নির্ভুল	০ ১ ২
১৪. বাচাল	০ ১ ২
১৫. নির্বোধ	০ ১ ২
১৬. ঘাটতি	০ ১ ২
১৭. বিরক্তিকর	০ ১ ২



6. Vocabulary (Continued)

১৮. দীপ	০ ১ ২
১৯. রূপকথা	০ ১ ২
২০. প্রতিদ্বন্দ্বিতা	০ ১ ২
২১. সংশোধন	০ ১ ২
২২. ঐক্যমত	০ ১ ২
*২৩. যন্ত্রণাদায়ক	০ ১ ২
২৪. আদেশ মেনে চলা	০ ১ ২
২৫. দেশান্তরিত হওয়া	০ ১ ২
২৬. ভয়ে নেয়া	০ ১ ২
২৭. স্বচ্ছ	০ ১ ২
২৮. প্রস্থান করা	০ ১ ২
২৯. শ্রম সাধ্য	০ ১ ২
৩০. তামাশার উদ্দেশ্যে অনুকরণ করা	০ ১ ২
৩১. বাধ্য করা	০ ১ ২
*৩২. আসন্ন	০ ১ ২
*৩৩. বিপথগামী	০ ১ ২
৩৪. বিলম্বকারী	০ ১ ২
৩৫. কম্পিং	০ ১ ২
৩৬. দূরদর্শিতা	০ ১ ২
	মোট স্কোর = (সর্বোচ্চ = ৬৮)

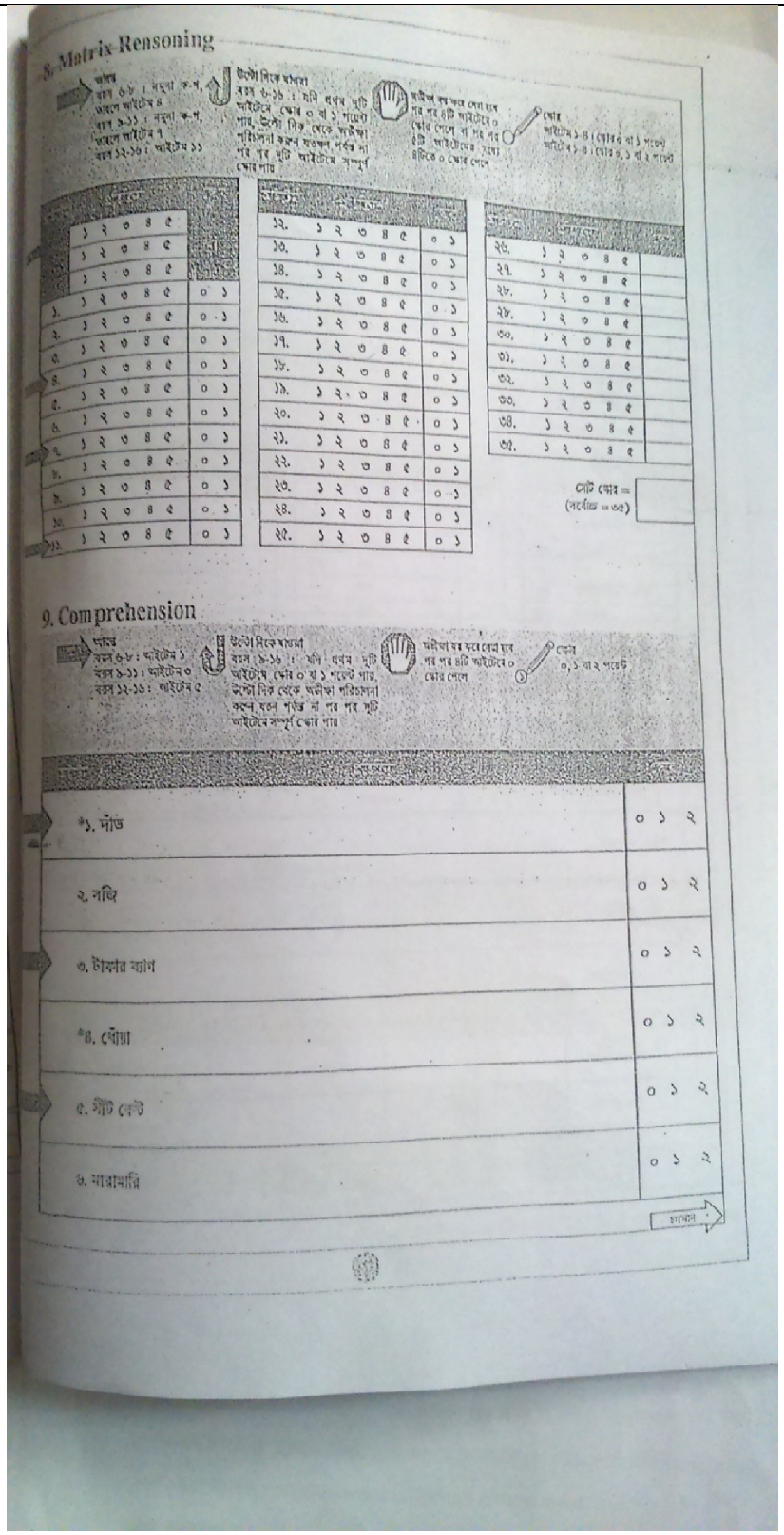


7. Letter-Number Sequencing

গণনা করা	শিউ three পর্যন্ত গণনা করবে
অক্ষর	শিউ C পর্যন্ত অক্ষর আবৃত্তি করবে

১.	১. A-2	2-A	A-2		০ ১	০১২০
	২. B-3	3-B	B-3			
	৩. A-3	3-A	A-3		০ ১	
২.	১. B-1	1-B	B-1		০ ১	০১২৩
	২. C-2	2-C	C-2		০ ১	
	৩. C-4	4-C	C-4		০ ১	
৩.	১. 5-E	5-E	E-5		০ ১	০১২৩
	২. 2-C	2-C	C-2		০ ১	
	৩. B-1-2	1-2-B	B-1-2		০ ১	
৪.	১. 1-3-C	1-3-C	C-1-3		০ ১	০১২৩
	২. 2-A-3	2-3-A	A-2-3		০ ১	
	৩. D-2-9	2-9-D	D-2-9		০ ১	
৫.	১. R-5-B	5-B-R	B-R-5		০ ১	০১২৩
	২. H-9-K	9-H-K	H-K-9		০ ১	
	৩. 3-E-2	2-3-E	E-2-3		০ ১	
৬.	১. 9-J-4	4-9-J	J-4-9		০ ১	০১২৩
	২. B-5-F	5-B-F	B-F-5		০ ১	
	৩. 1-C-3-J	1-3-C-J	C-J-1-3		০ ১	
৭.	১. 5-A-2-B	2-5-A-B	A-B-2-5		০ ১	০১২৩
	২. D-8-M-1	1-8-D-M	D-M-1-8		০ ১	
	৩. 1-B-3-G-7	1-3-7-B-G	B-G-1-3-7		০ ১	
৮.	১. 9-V-1-T-7	1-7-9-T-V	T-V-1-7-9		০ ১	০১২৩
	২. P-3-J-1-M	1-3-J-P-M	J-P-M-1-3		০ ১	
	৩. 1-D-4-E-9-G	1-4-9-D-E-G	D-E-G-1-4-9		০ ১	
৯.	১. H-3-B-4-F-8	3-4-8-B-F-H	B-F-H-3-4-8		০ ১	০১২৩
	২. 7-Q-6-M-3-Z	3-6-7-M-Q-Z	M-Q-Z-3-6-7		০ ১	
	৩. S-3-K-4-Y-1-G	1-3-4-G-K-S-Y	G-K-S-Y-1-3-4		০ ১	
১০.	১. 7-S-9-K-1-T-6	1-6-7-9-K-S-T	K-S-T-1-6-7-9		০ ১	০১২৩
	২. L-2-J-6-Q-3-G	2-3-6-G-J-L-Q	G-J-L-Q-2-3-6		০ ১	
	৩. 4-B-8-R-1-M-7-H	1-4-7-8-B-H-M-R	B-H-M-R-1-4-7-8		০ ১	
	১. J-2-U-8-A-5-G-4	2-4-5-8-A-G-J-U	A-G-J-U-2-4-5-8		০ ১	০১২৩
	২. A-C-J-U-2-4-5-8	1-2-5-6-H-L-W-Z	H-L-W-Z-1-2-5-6		০ ১	

মোট স্কোর =
(সর্বোচ্চ = ৩০)



8. Matrix Reasoning

9. Comprehension

*১. দাঁড়

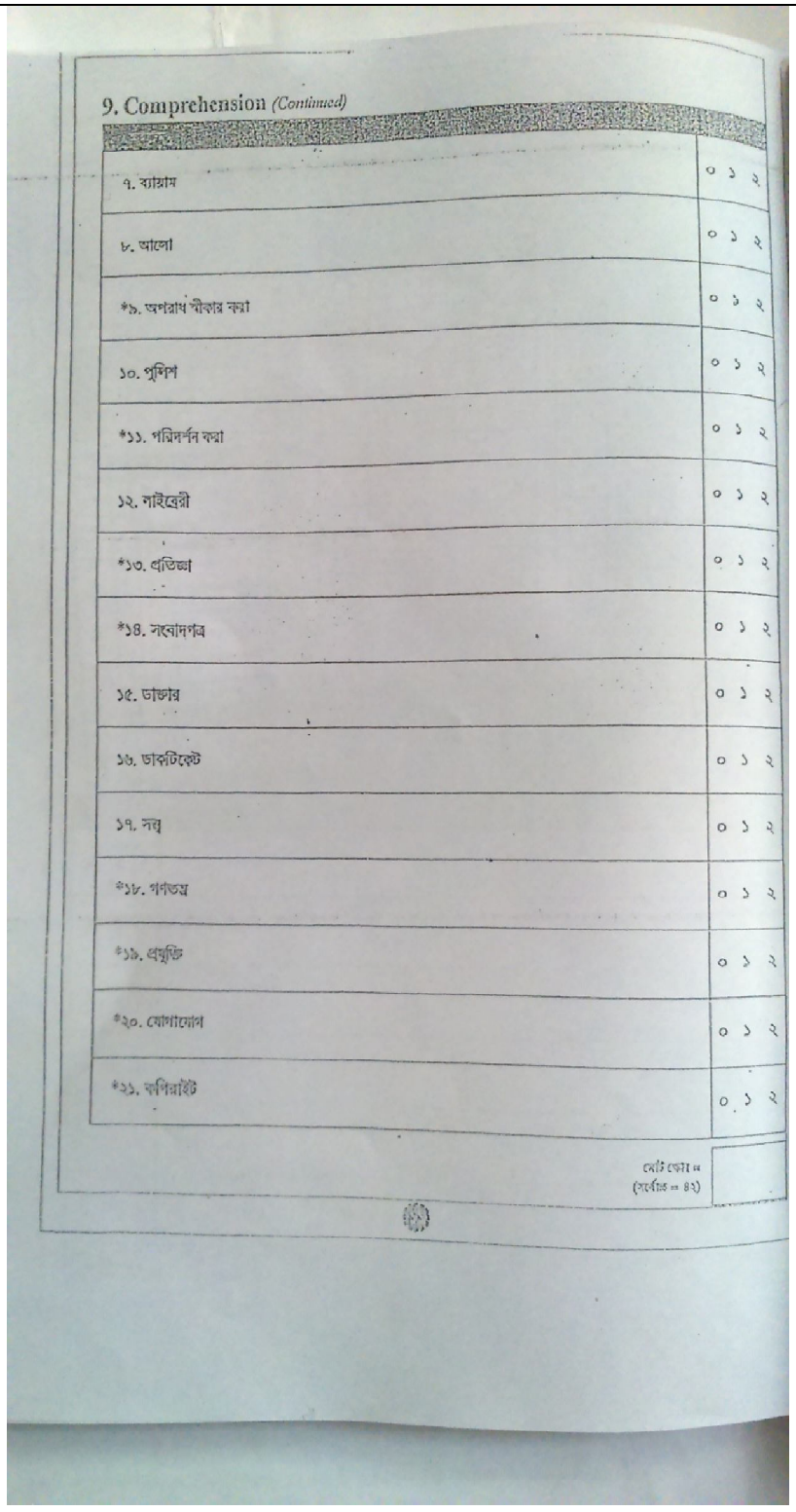
২. নড়ি

৩. টাকার ব্যাগ

*৪. ধোঁয়া

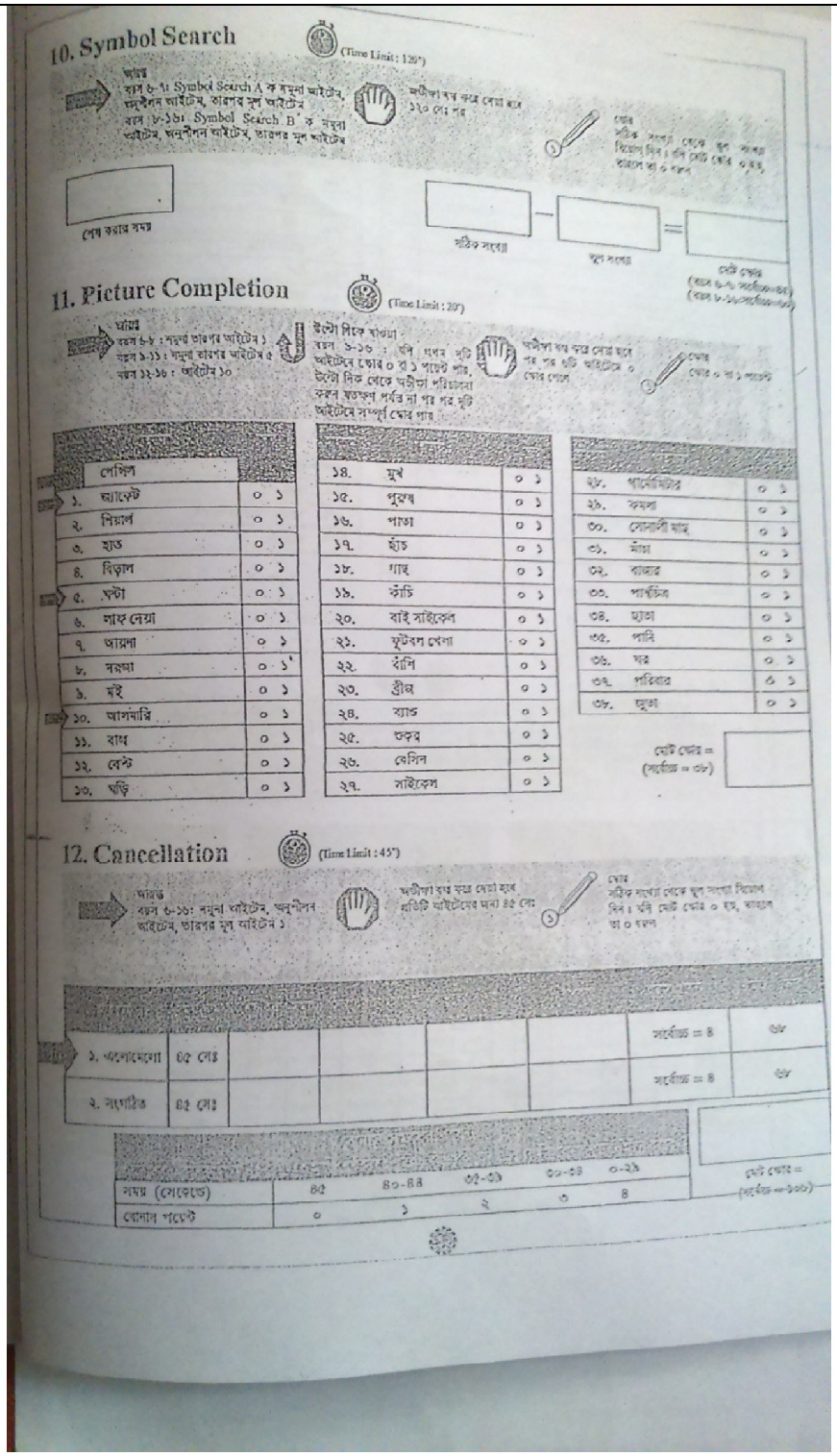
৫. সীট বেল্ট

৬. মারামারি



9. Comprehension *(Continued)*

৭. ব্যায়াম	০ ১ ২
৮. আলো	০ ১ ২
*৯. অপরাধ স্বীকার করা	০ ১ ২
১০. পুলিশ	০ ১ ২
*১১. পরিদর্শন করা	০ ১ ২
১২. লাইব্রেরী	০ ১ ২
*১৩. প্রতিজ্ঞা	০ ১ ২
*১৪. সংবাদপত্র	০ ১ ২
১৫. ডাক্তার	০ ১ ২
১৬. ডাকটিকেট	০ ১ ২
১৭. সত্ব	০ ১ ২
*১৮. গণতন্ত্র	০ ১ ২
*১৯. প্রযুক্তি	০ ১ ২
*২০. যোগাযোগ	০ ১ ২
*২১. কপিরাইট	০ ১ ২
	মোট স্কোর = (সর্বোচ্চ = ৪২)



10. Symbol Search

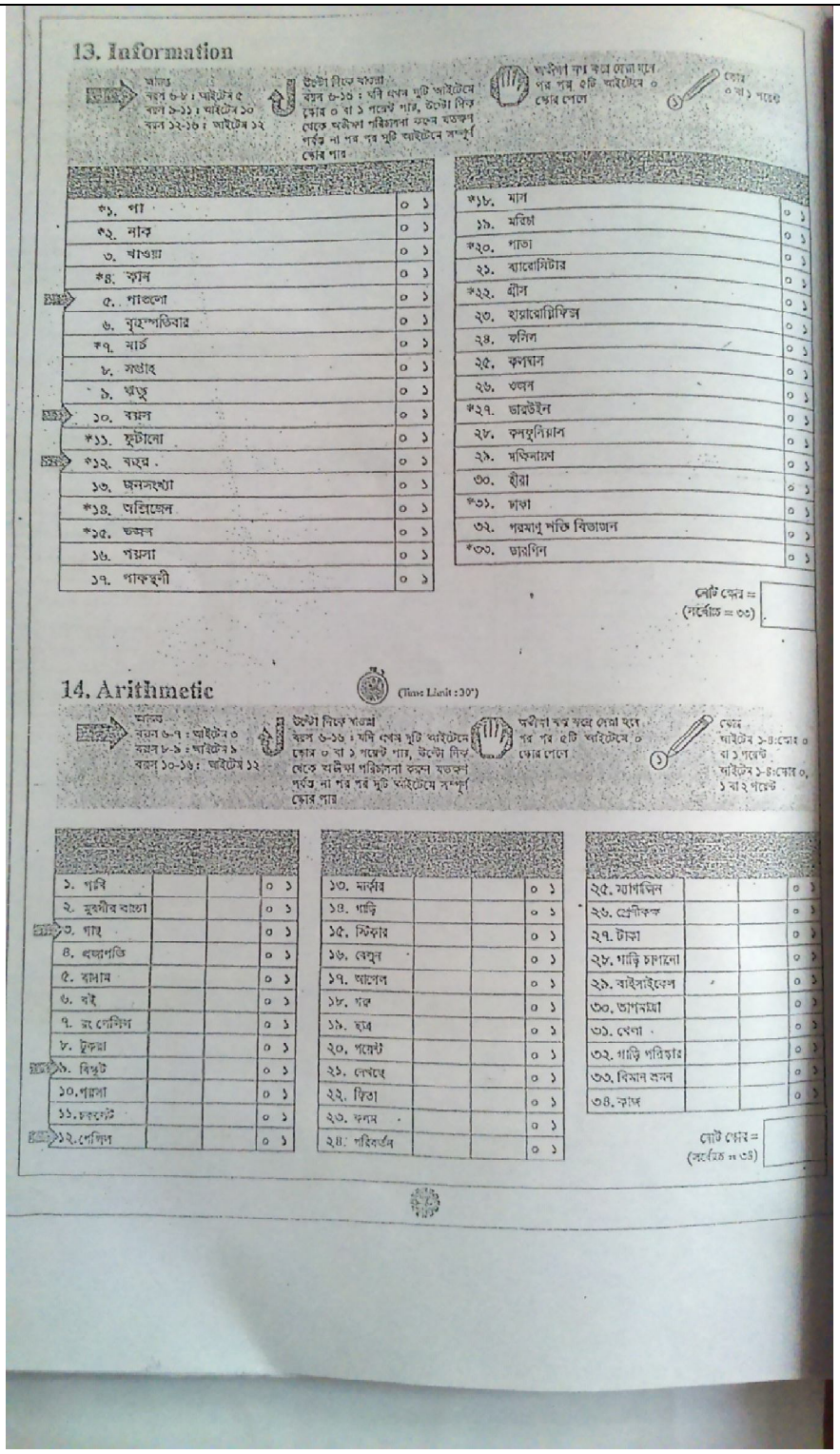
(Time Limit: 120")

11. Picture Completion

(Time Limit: 20")

12. Cancellation

(Time Limit: 45")



13. Information

*১. পা	০	১
*২. নাক	০	১
৩. খাওয়া	০	১
*৪. কান	০	১
৫. গাওলো	০	১
৬. মুহূর্তিবার	০	১
*৭. মার্চ	০	১
৮. সপ্তাহ	০	১
৯. খুড়ু	০	১
১০. বয়স	০	১
*১১. ফুটানো	০	১
*১২. বছর	০	১
১৩. জনসংখ্যা	০	১
*১৪. অহিজেন	০	১
*১৫. জন্ম	০	১
১৬. পয়সা	০	১
১৭. পাকস্থলী	০	১
*১৮. মাস	০	১
১৯. মরিচা	০	১
*২০. পাতা	০	১
২১. ব্যারোমিটার	০	১
*২২. গ্রীন	০	১
২৩. হাইড্রোক্লিফিল্ড	০	১
২৪. ফসিল	০	১
২৫. ফুসফুস	০	১
২৬. ওজন	০	১
*২৭. ডারউইন	০	১
২৮. ফসফুরিয়াস	০	১
২৯. মফিনাস	০	১
৩০. হীরা	০	১
*৩১. দাঁত	০	১
৩২. পরমাণু শক্তি বিভাগন	০	১
*৩৩. ডায়গিন	০	১

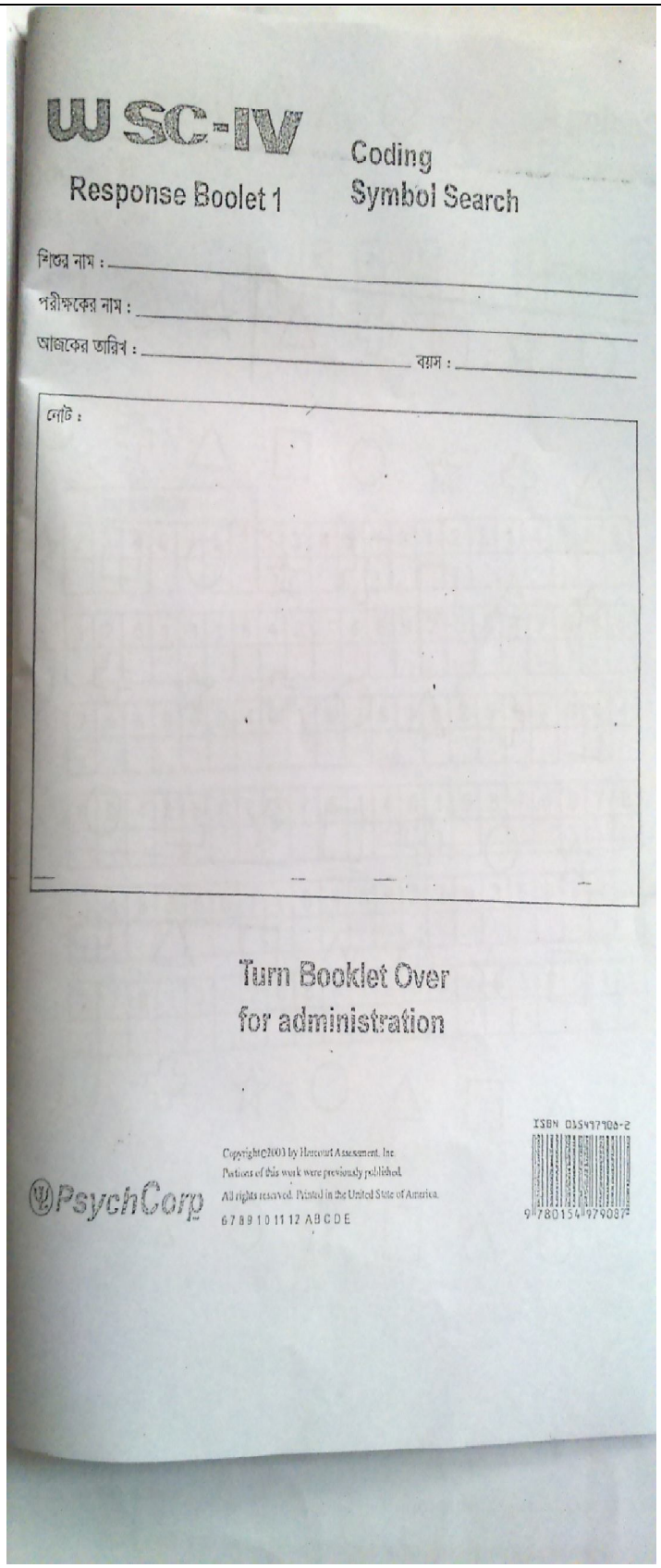
মোট স্কোর = (সর্বোচ্চ = ৩৩)

14. Arithmetic

(Time Limit : 30')

১. গাড়ি			০ ১
২. মুহূর্তীর বাচ্চা			০ ১
৩. গাই			০ ১
৪. ধ্বজপতি			০ ১
৫. বাদাম			০ ১
৬. বই			০ ১
৭. রু লেগিন্স			০ ১
৮. টুকরা			০ ১
৯. বিস্কুট			০ ১
১০. পয়সা			০ ১
১১. চকলেট			০ ১
১২. পেন্সিল			০ ১
১৩. মার্কার			০ ১
১৪. গাড়ি			০ ১
১৫. স্টিকার			০ ১
১৬. বেসুন			০ ১
১৭. খাপোল			০ ১
১৮. গরু			০ ১
১৯. ছাত্র			০ ১
২০. পয়েন্ট			০ ১
২১. লেখছে			০ ১
২২. চিতা			০ ১
২৩. ফলস			০ ১
২৪. পরিবর্তন			০ ১
২৫. স্যাপলিন			০ ১
২৬. প্রেসীকল			০ ১
২৭. টাকা			০ ১
২৮. গাড়ি চালানো			০ ১
২৯. বাইসাইকেল			০ ১
৩০. তাপনমা			০ ১
৩১. খেলা			০ ১
৩২. গাড়ি পরিষ্কার			০ ১
৩৩. বিমান ভ্রমন			০ ১
৩৪. কাদ			০ ১

মোট স্কোর = (সর্বোচ্চ = ৩৪)


WISC-IV

Coding
Symbol Search

Response Booklet 1

শিশুর নাম : _____

পরীক্ষকের নাম : _____

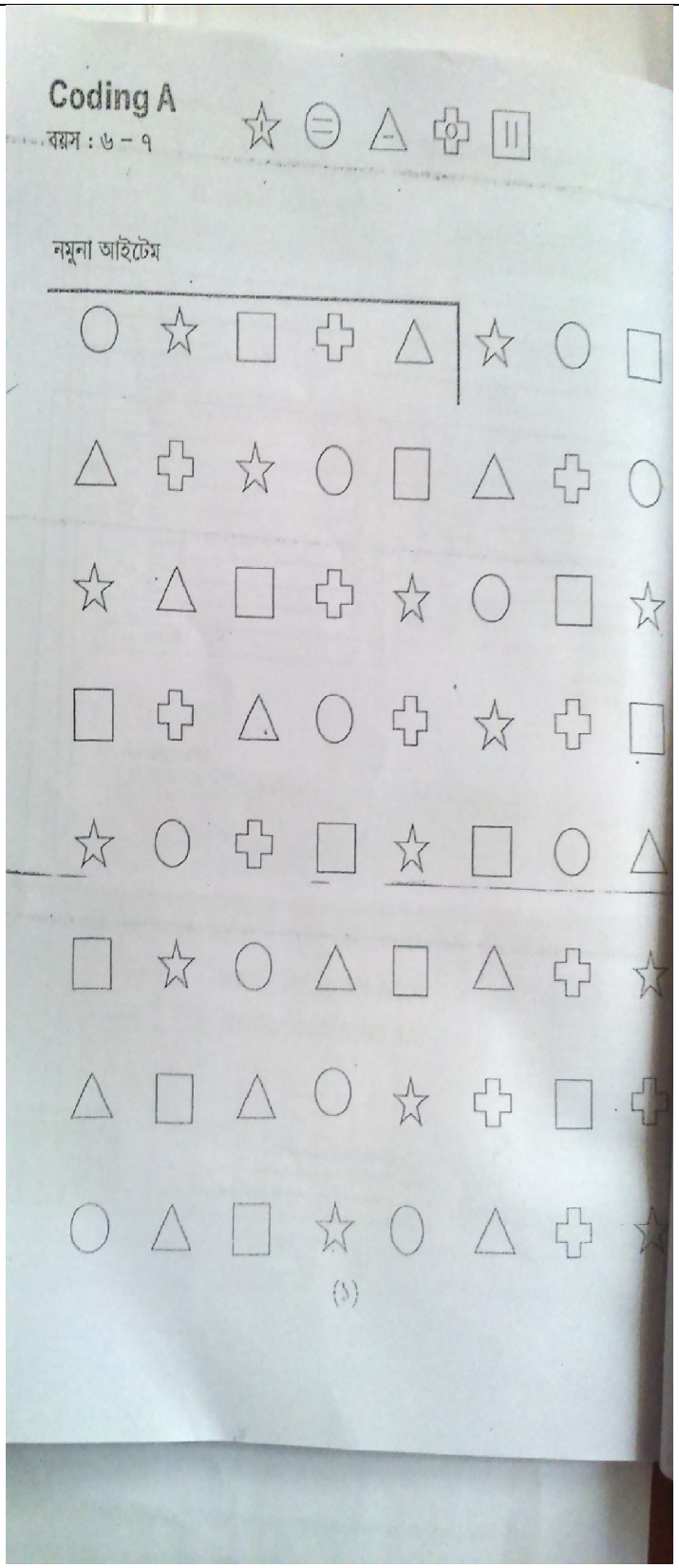
আজকের তারিখ : _____ বয়স : _____

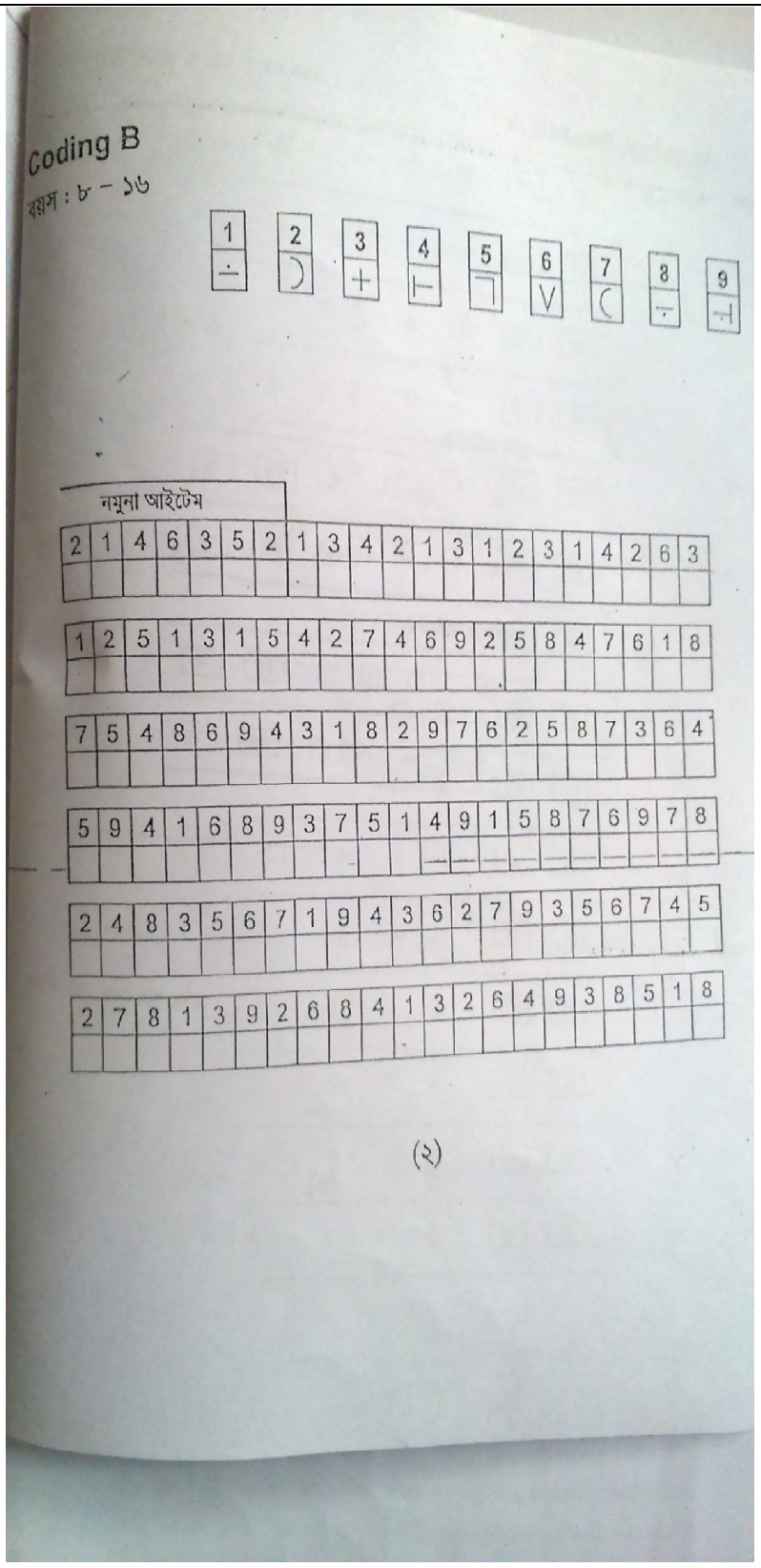
নোট :

Turn Booklet Over
for administration

ISBN 0154977903-2
9 780154 979087

PsychCorp
6 7 8 9 10 11 12 A B C D E


Coding A
বয়স : ৬ – ৭
নমুনা আইটেম
(১)



Coding B

বয়স : ৮ – ১৬

1	2	3	4	5	6	7	8	9
÷	)	+	⊢	⊐	V	(	·	⊣

নমুনা আইটেম

2	1	4	6	3	5	2	1	3	4	2	1	3	1	2	3	1	4	2	6	3

1	2	5	1	3	1	5	4	2	7	4	6	9	2	5	8	4	7	6	1	8

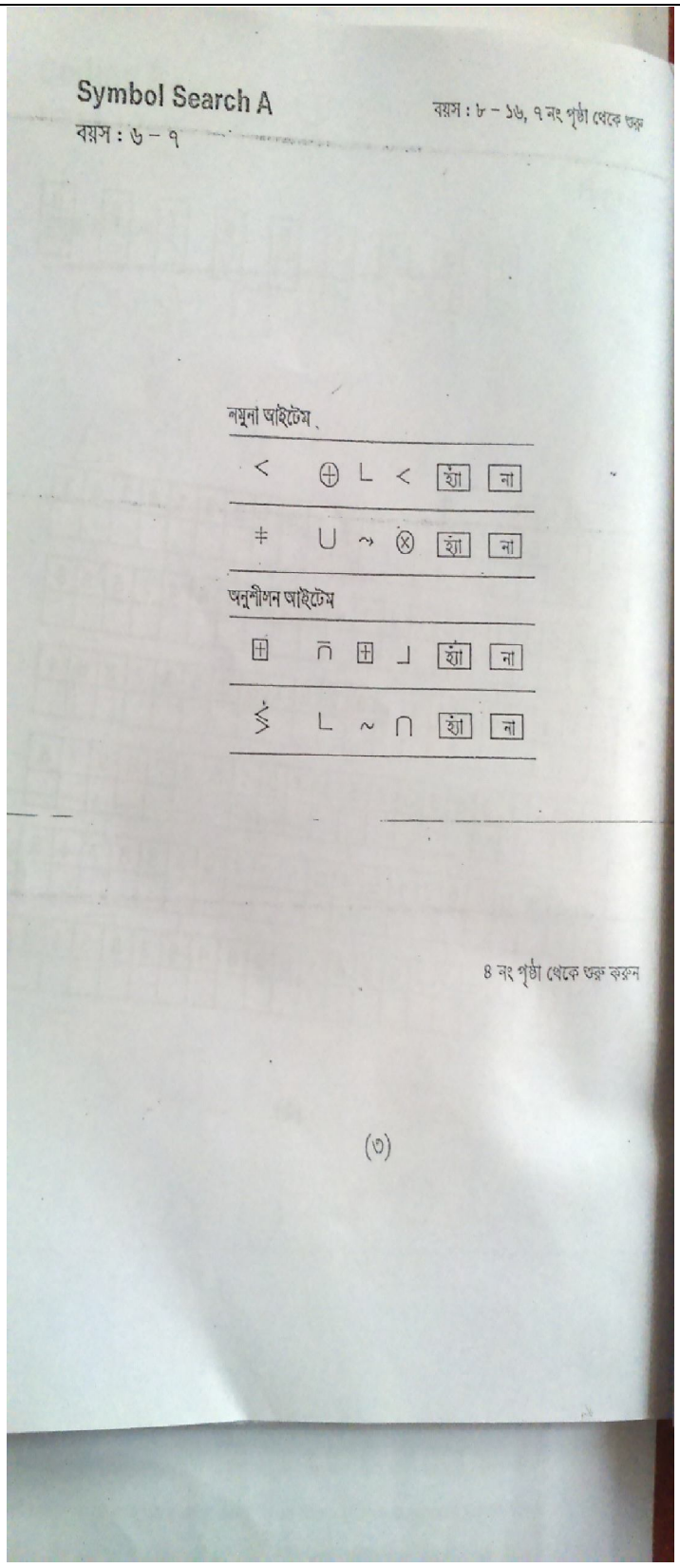
7	5	4	8	6	9	4	3	1	8	2	9	7	6	2	5	8	7	3	6	4

5	9	4	1	6	8	9	3	7	5	1	4	9	1	5	8	7	6	9	7	8

2	4	8	3	5	6	7	1	9	4	3	6	2	7	9	3	5	6	7	4	5

2	7	8	1	3	9	2	6	8	4	1	3	2	6	4	9	3	8	5	1	8

(২)



Symbol Search A

বয়স : ৬ – ৭

বয়স : ৮ – ১৬, ৭ নং পৃষ্ঠা থেকে শুরু

নমুনা আইটেম

< ⊕ L < হ্যাঁ না

≠ ∪ ⇝ ⊗ হ্যাঁ না

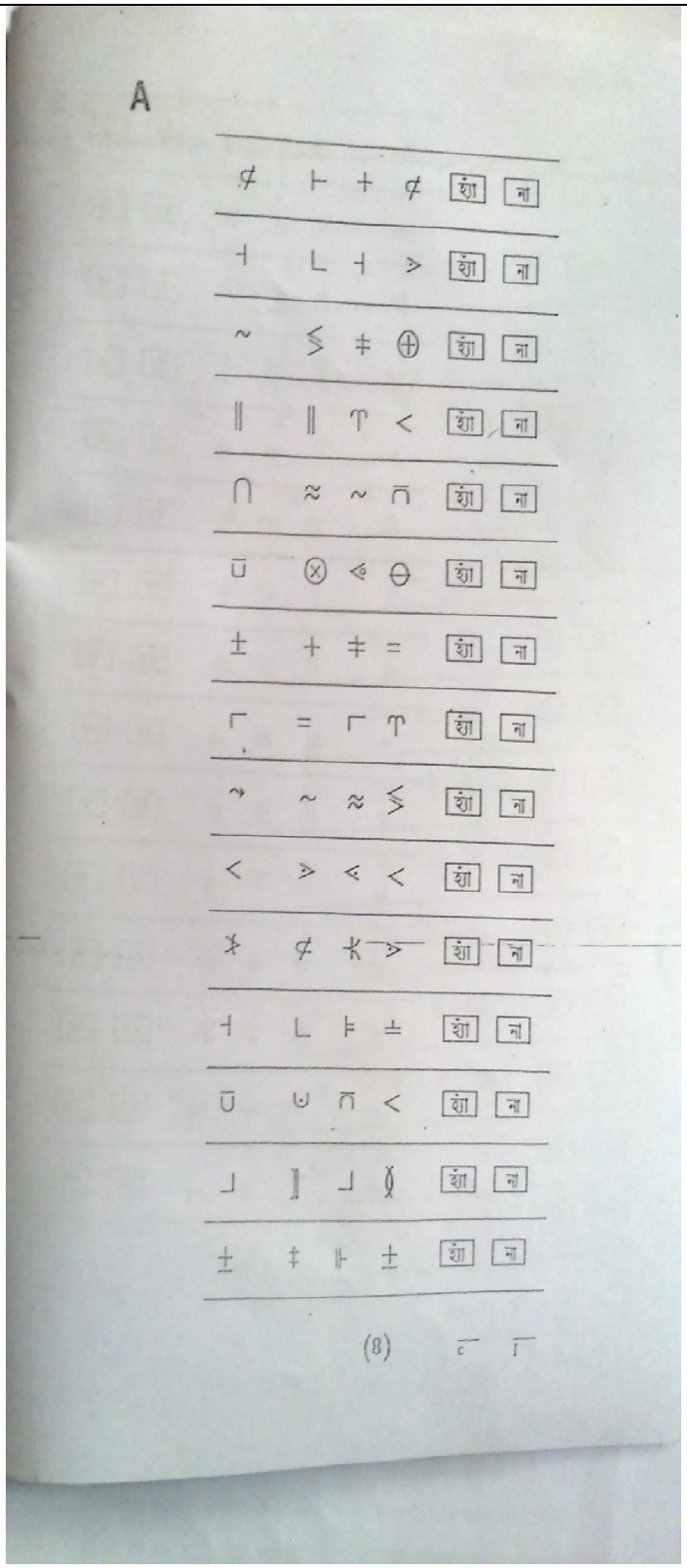
অনুশীলন আইটেম

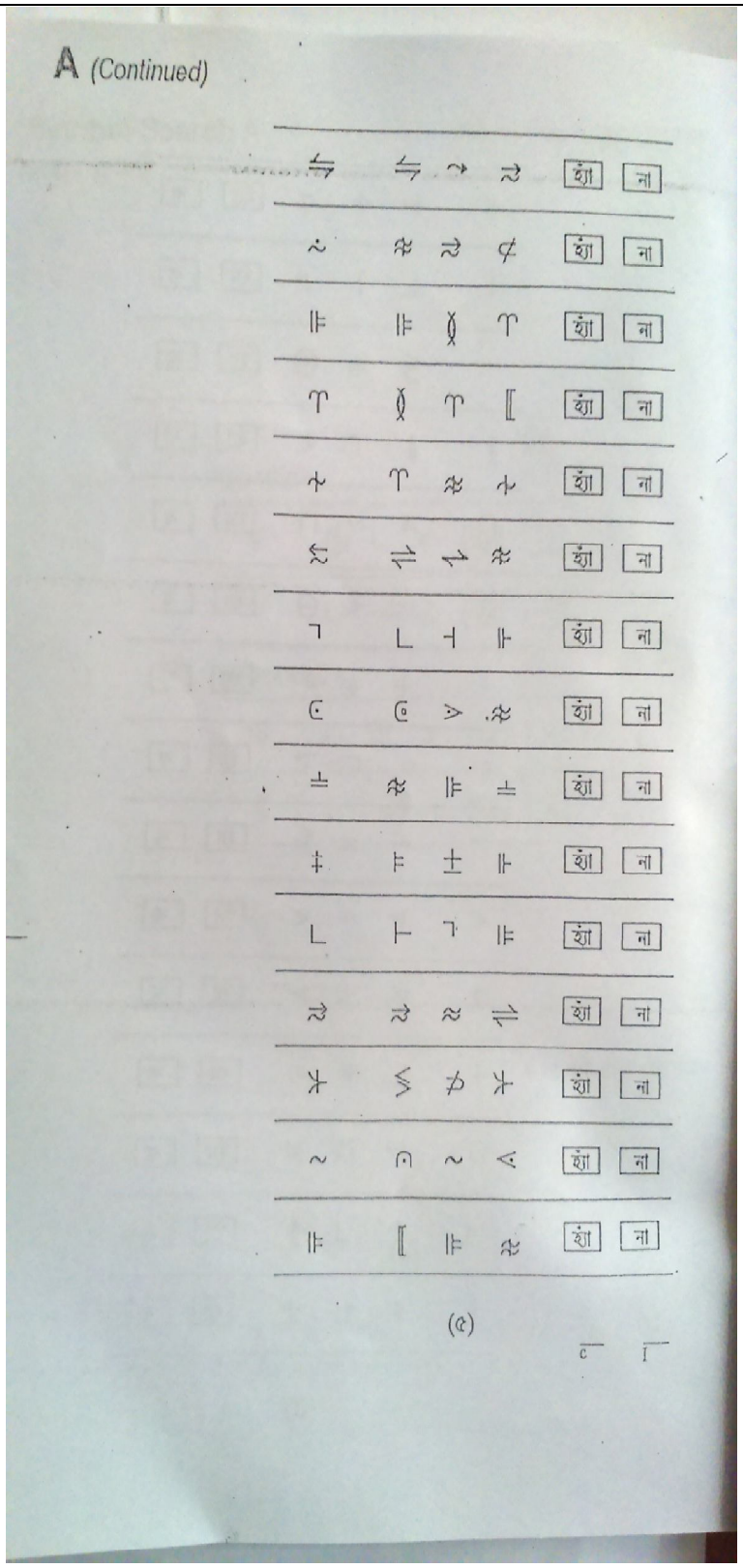
⊞ ⊓ ⊞ ⌟ হ্যাঁ না

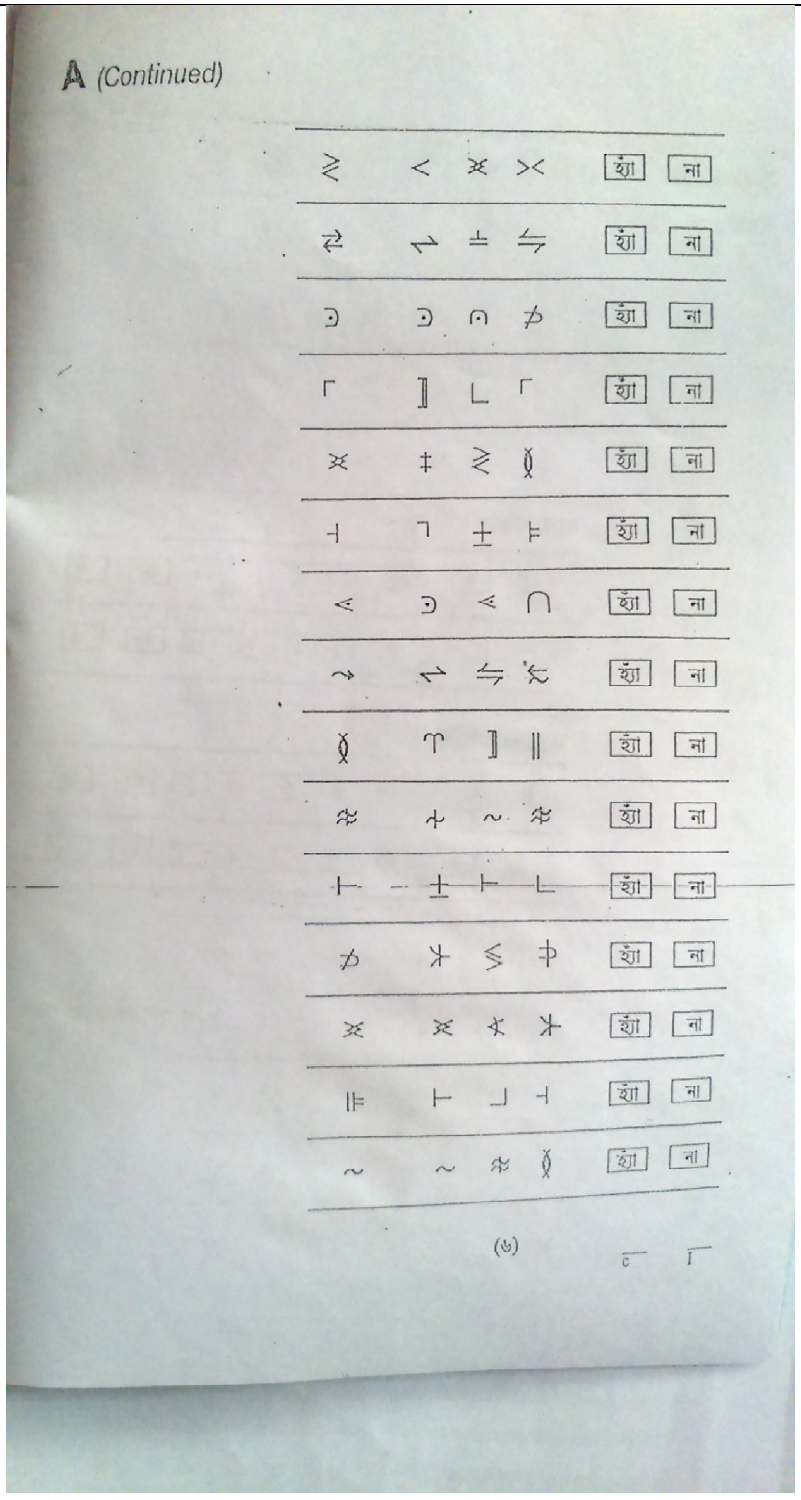
≶ L ~ ∩ হ্যাঁ না

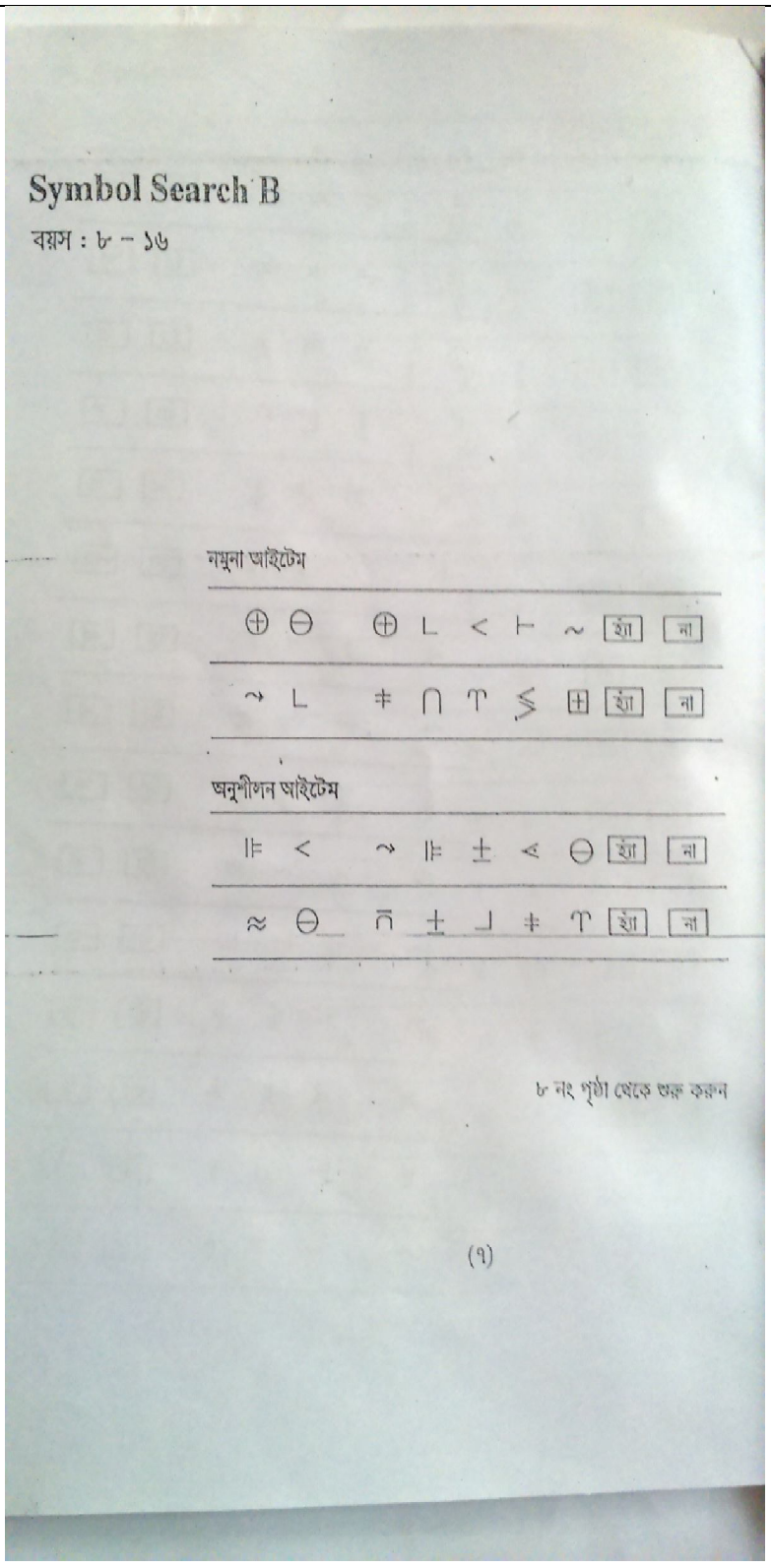
৪ নং পৃষ্ঠা থেকে শুরু করুন

(৩)


A
हाँ
ना


A (Continued)
(৫)


A (Continued)
हाँ
ना



Symbol Search B

বয়স : ৮ – ১৬

নমুনা আইটেম

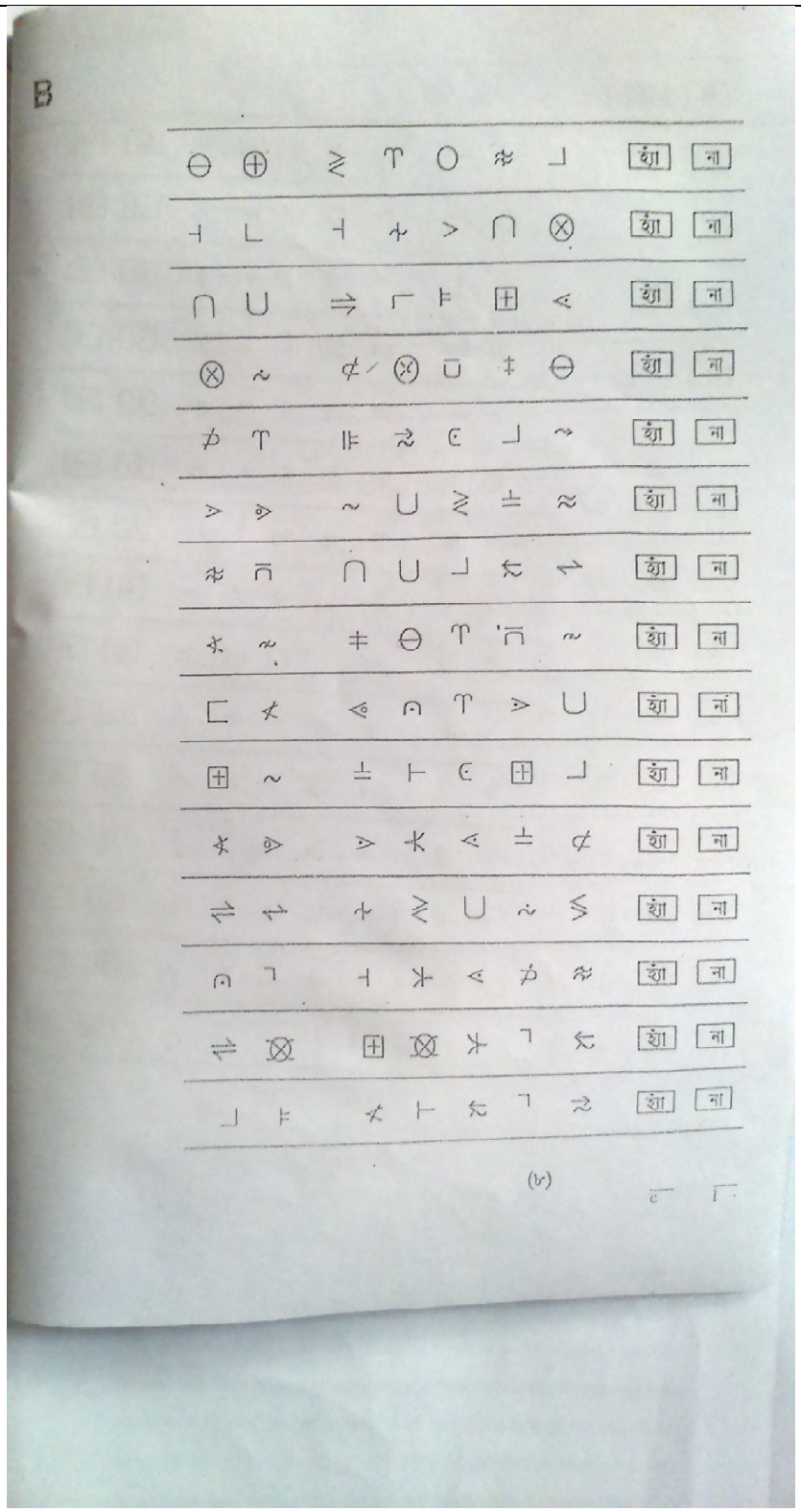
⊕	⊖	⊕	L	<	⊢	~	হ্যাঁ	না	
⇝	L	≠	∩	⊤	≦	⊞	হ্যাঁ	না	

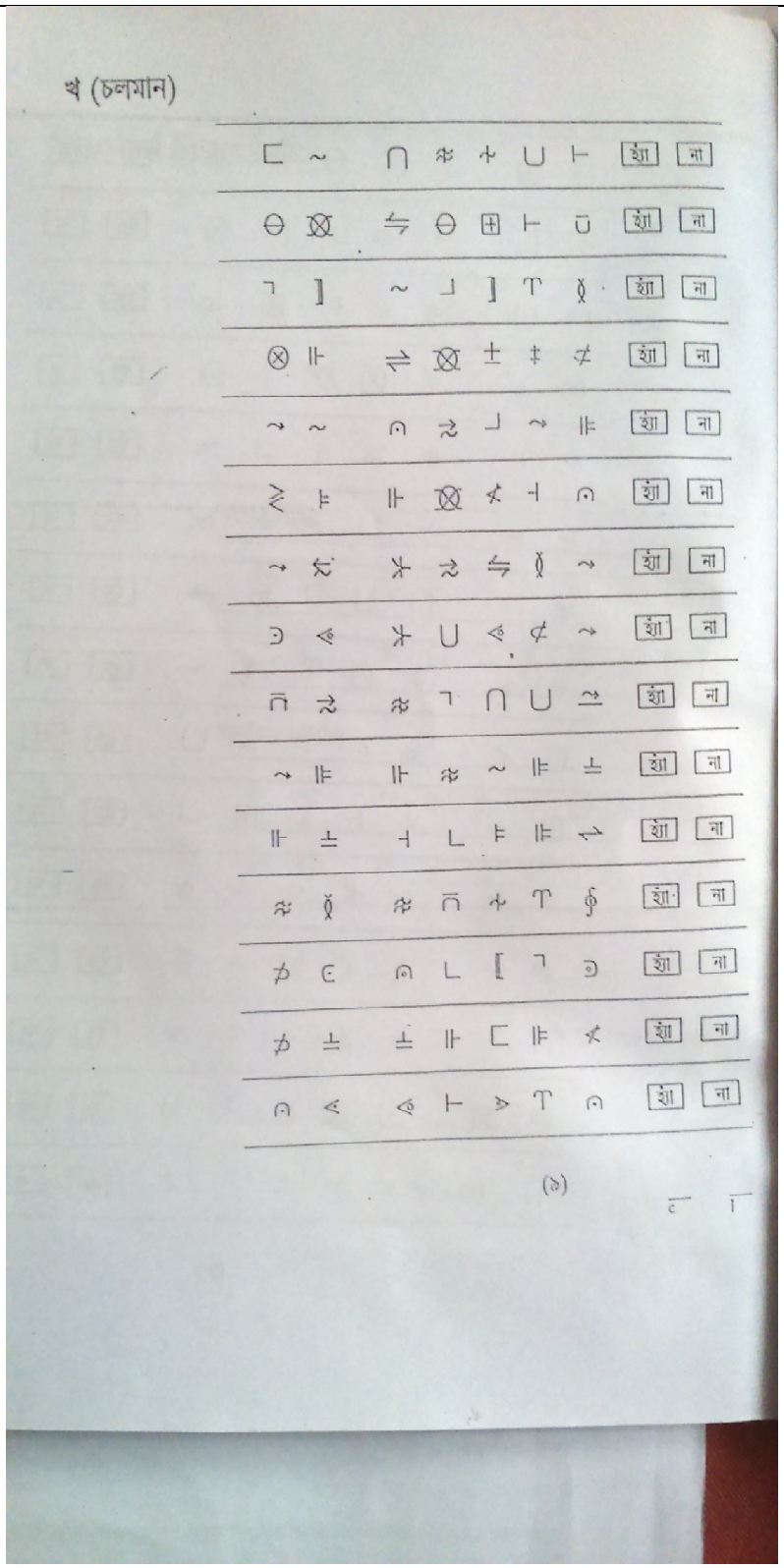
অনুশীলন আইটেম

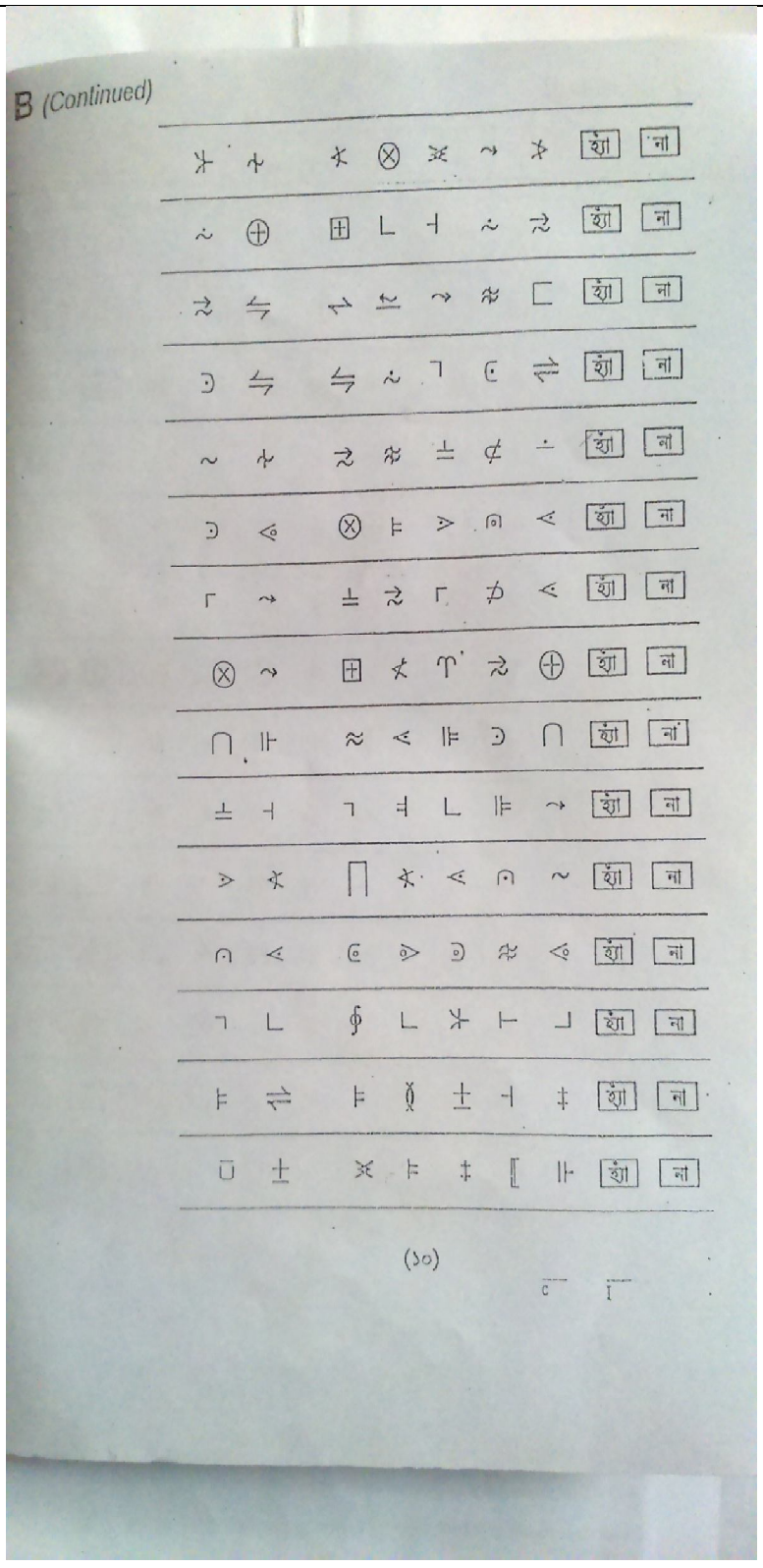
⊨	<	⇝	⊨	±	≮	⊖	হ্যাঁ	না	
≈	⊖	⊓	±	⊥	≠	⊤	হ্যাঁ	না	

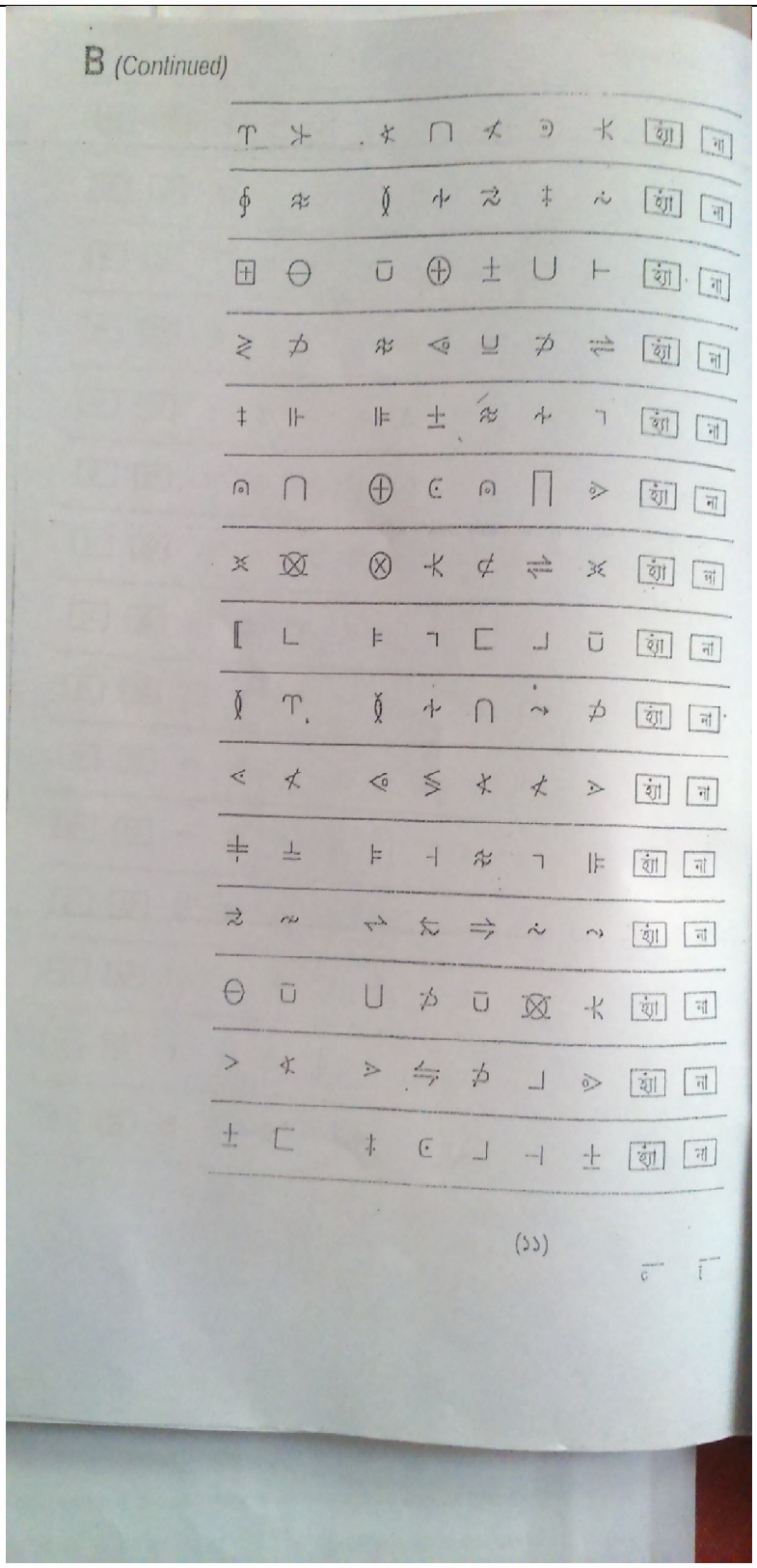
৮ নং পৃষ্ঠা থেকে শুরু করুন

(৭)


B
हाँ
ना


খ (চলমান)
হ্যাঁ
না


B (Continued)
हाँ
ना
(১০)


B (Continued)
हाँ
ना

Appendix 3

Mother's Education of the study sample

Variable category: Mother's education	Frequency	Percent
Below SSC	9	3.0
SSC	10	3.3
HSC	30	10.0
Honors	122	40.7
Masters or above	129	43.0
Total	300	100.0

Father's Education of the study sample

Father's education	Frequency	Percent
Honors	81	27.0
Masters or above	219	73.0
Total	300	100.0

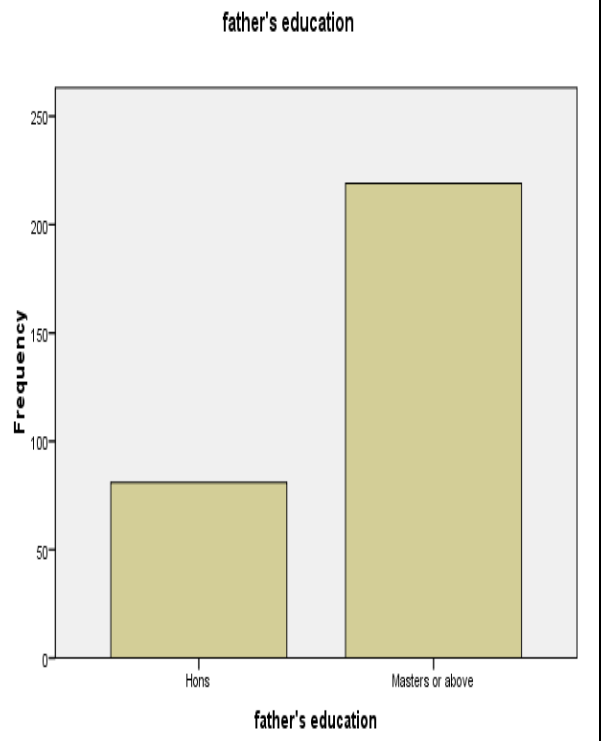


Fig 3.2.1. Father's education

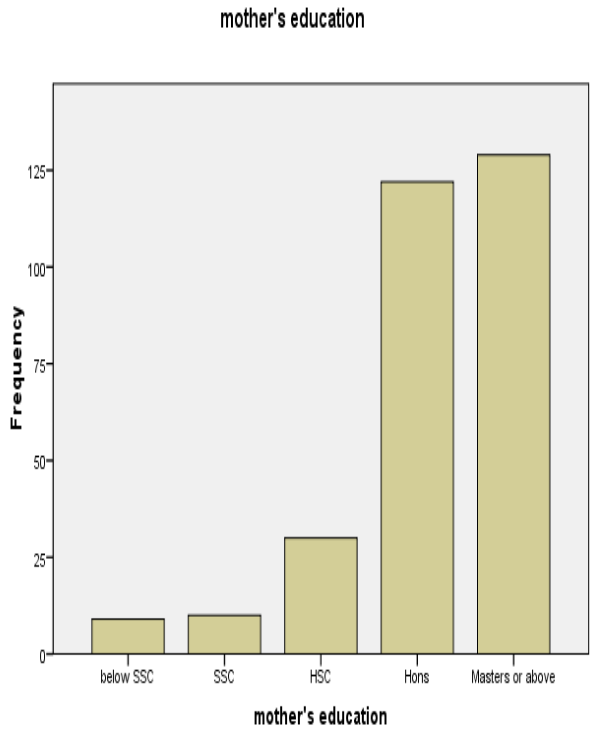


Fig 3.2.2. Mother's education

Descriptive statistics of parents' education

Family type of the study sample

Family type	Frequency	Percent
urban	148	49.3
rural	152	50.7
Total	300	100.0

Table 3.4: Family structure of the study sample

Family structure	Frequency	Percent
Joint family	131	43.7
Nuclear family	169	56.3
Total	300	100.0

Number of siblings of the study sample

Number of siblings	Frequency	Percent
only 1 child	58	19.3
2 children	148	49.3
3 children	57	19.0
4 children	20	6.7
5 or more children	17	5.7
Total	300	100.0

Frequencies

Statistics

		class	age	sex
N	Valid	300	300	300
	Missing	0	0	0
Mean		2.00	2.00	1.50
Std. Deviation		.820	.820	.501
Variance		.672	.672	.251
Range		2	2	1
Minimum		1	1	1
Maximum		3	3	2

Frequency Table

class

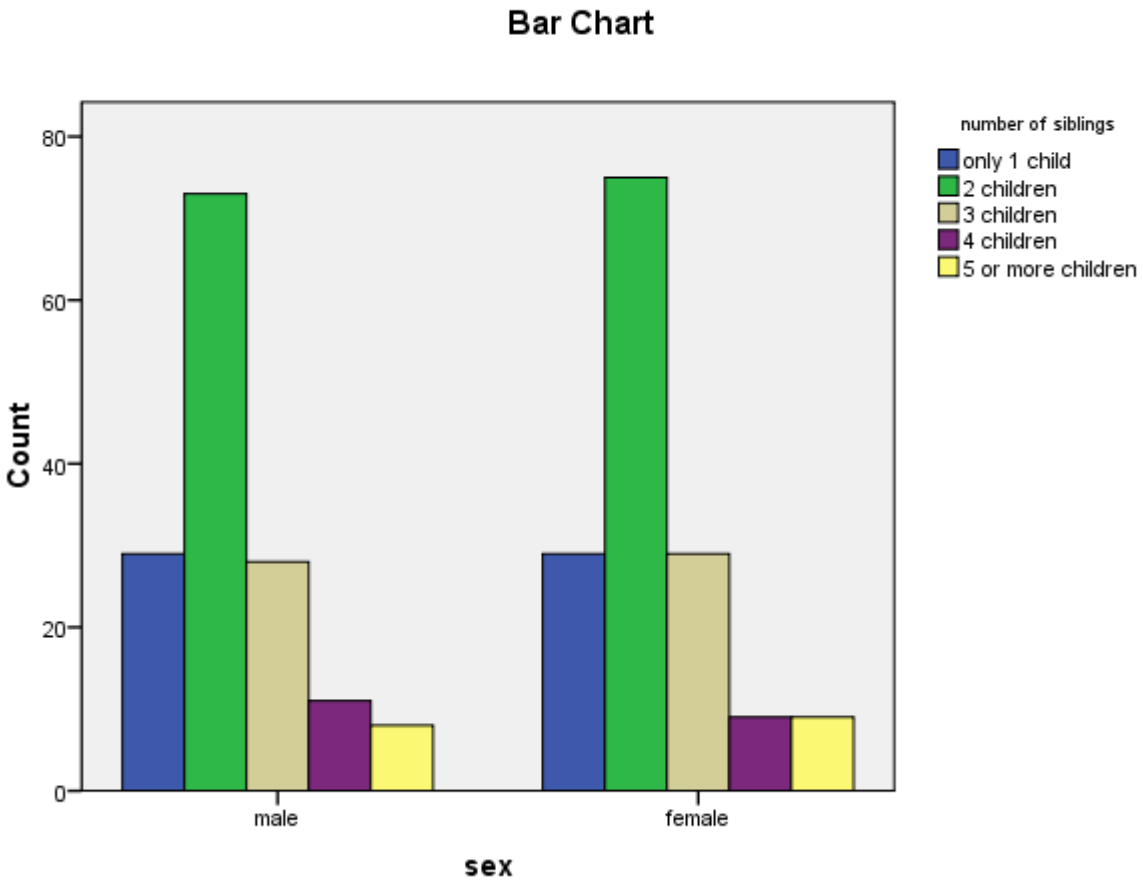
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	vi	101	33.7	33.7	33.7
	vii	99	33.0	33.0	66.7
	viii	100	33.3	33.3	100.0
	Total	300	100.0	100.0	

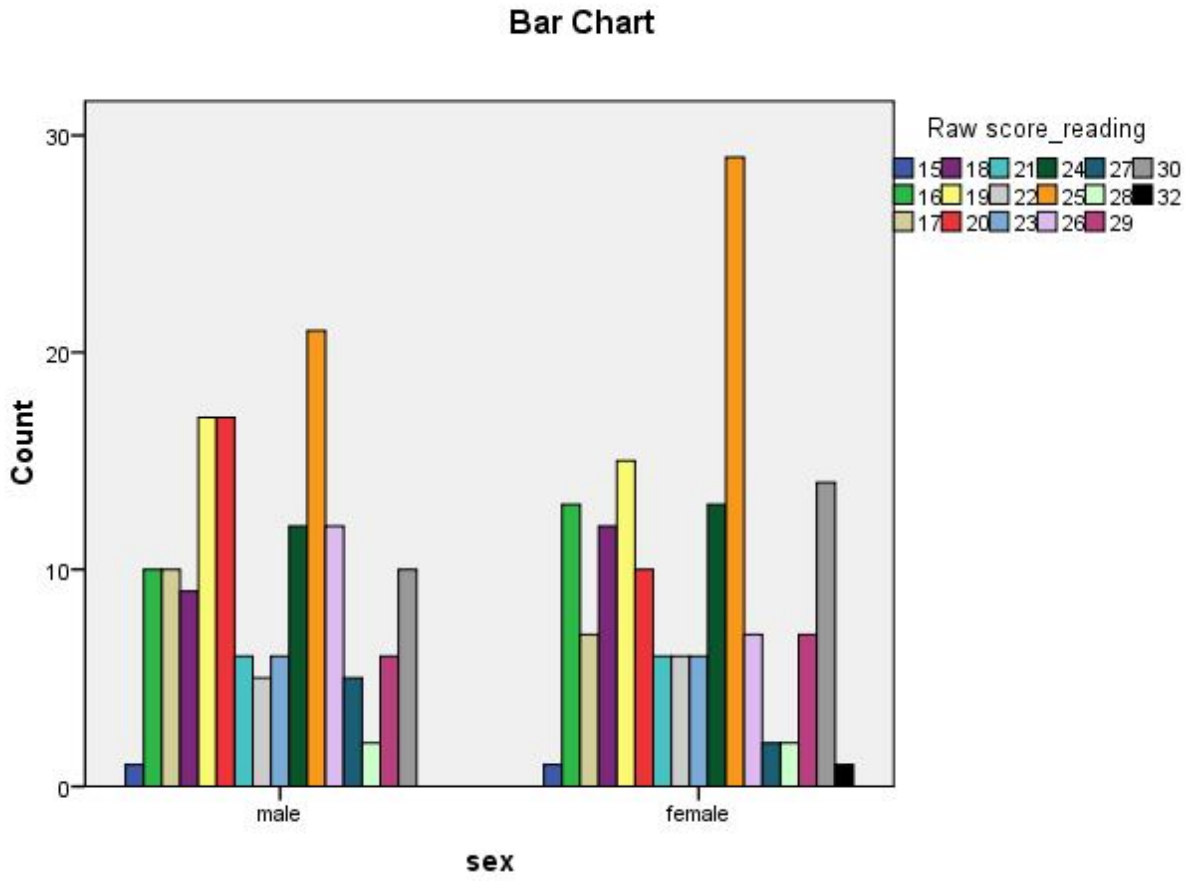
age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10-12	101	33.7	33.7	33.7
	13	99	33.0	33.0	66.7
	14	100	33.3	33.3	100.0
	Total	300	100.0	100.0	

sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	149	49.7	49.7	49.7
	female	151	50.3	50.3	100.0
	Total	300	100.0	100.0	


Bar Chart
number of siblings
only 1 child
2 children
3 children
4 children
5 or more children
Count
80
60
40
20
0
male
female
sex

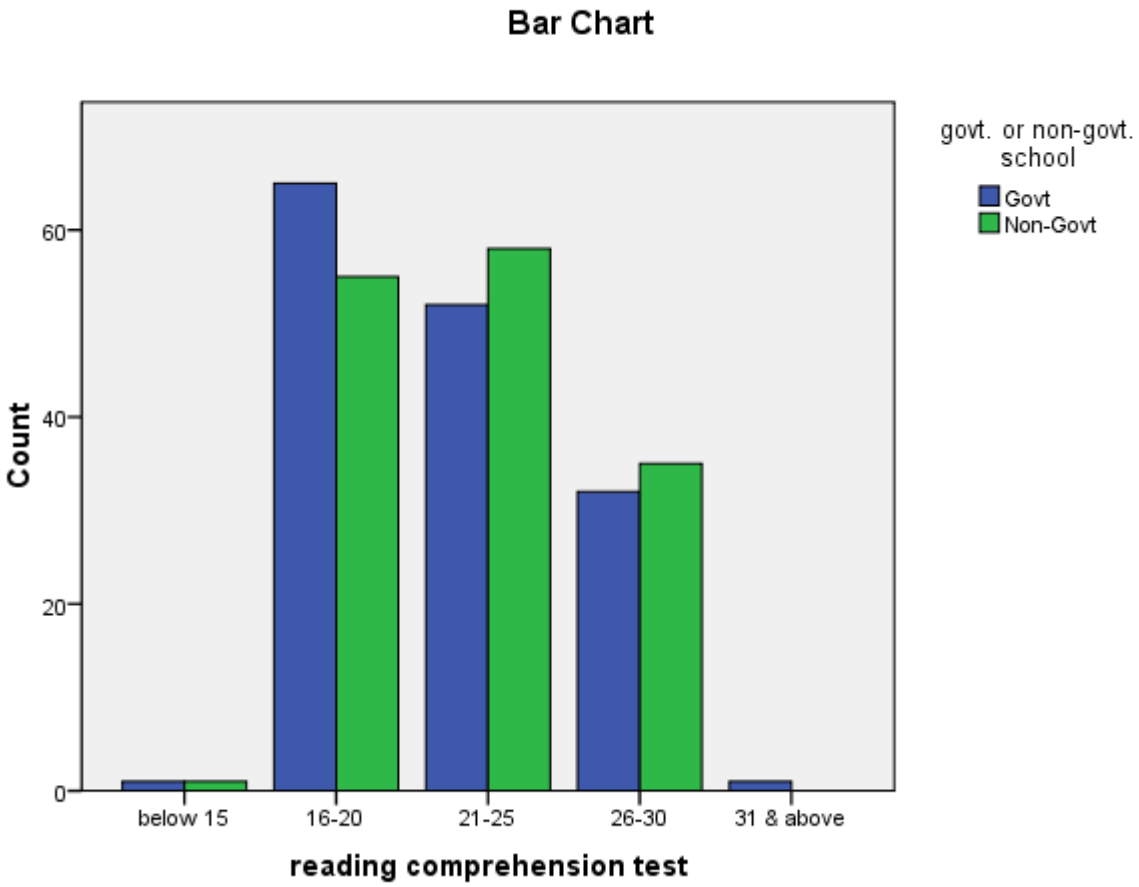


Crosstabs

reading comprehension test * govt. or non-govt. school Crosstabulation

Count

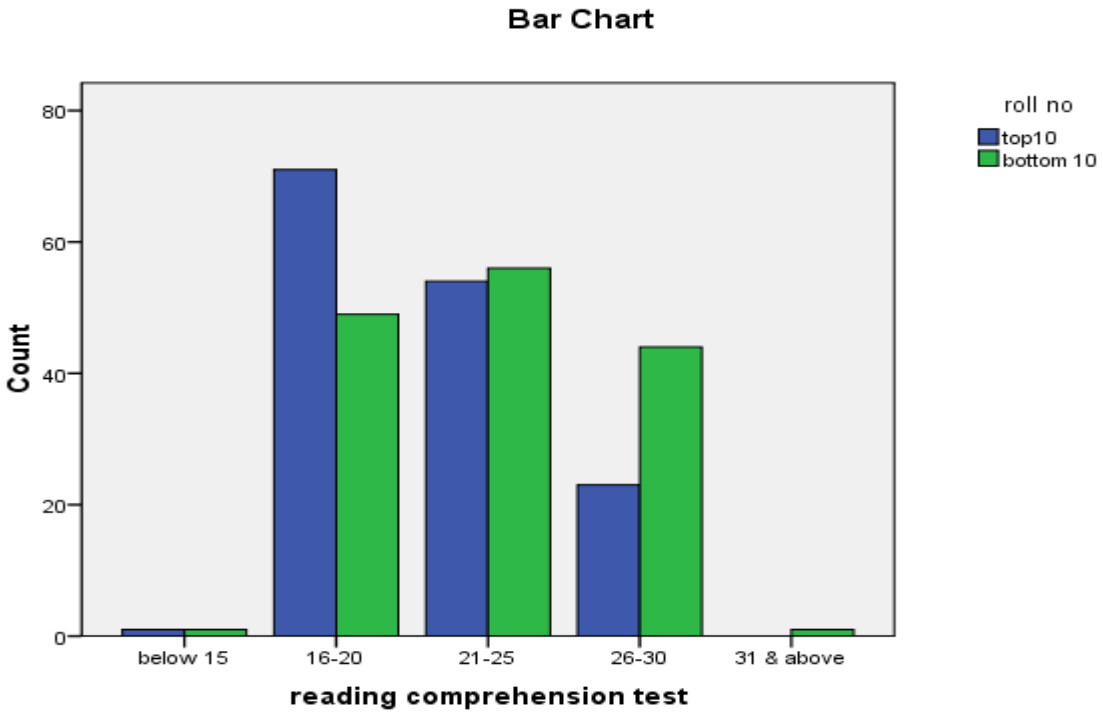
		govt. or non-govt. school		
		Govt	Non-Govt	Total
reading comprehension test	below 15	1	1	2
	16-20	65	55	120
	21-25	52	58	110
	26-30	32	35	67
	31 & above	1	0	1
Total		151	149	300

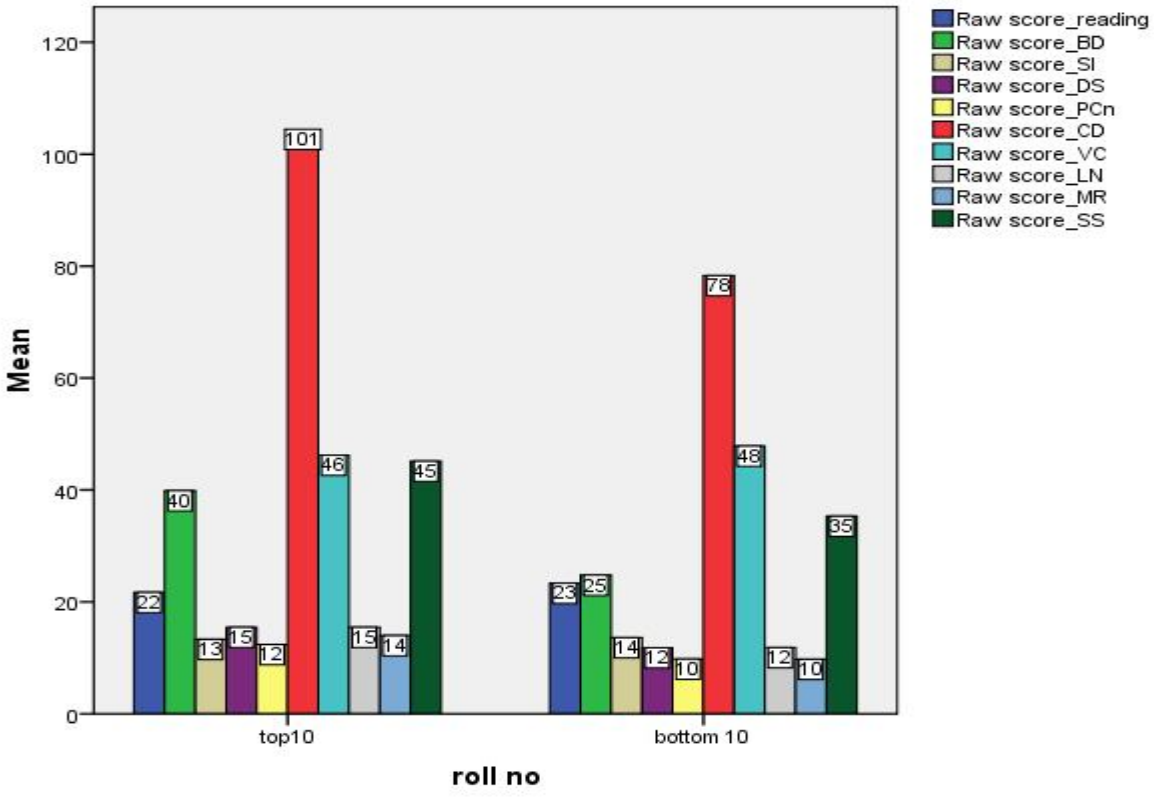


reading comprehension test * roll no Crosstabulation

Count

		roll no		
		top10	bottom 10	Total
reading comprehension test	below 15	1	1	2
	16-20	71	49	120
	21-25	54	56	110
	26-30	23	44	67
	31 & above	0	1	1
Total		149	151	300


Bar Chart
roll no
top10
bottom 10
Count
80
60
40
20
0
below 15
16-20
21-25
26-30
31 & above
reading comprehension test


Raw score_reading
Raw score_BD
Raw score_SI
Raw score_DS
Raw score_PCn
Raw score_CD
Raw score_VC
Raw score_LN
Raw score_MR
Raw score_SS
Mean
120
100
80
60
40
20
0
22
40
13
15
12
101
46
15
14
45
23
25
14
12
10
78
48
12
10
35
top10
bottom 10
roll no

T-Test

Group Statistics

	govt. or non-govt. school	N	Mean	Std. Deviation	Std. Error Mean
Raw score_reading	Govt	151	22.13	4.306	.350
	Non-Govt	149	22.93	4.225	.346
Raw score_BD	Govt	151	31.66	9.446	.769
	Non-Govt	149	32.93	9.303	.762
Raw score_SI	Govt	151	13.39	2.366	.193
	Non-Govt	149	13.54	2.335	.191
Raw score_DS	Govt	151	13.16	2.482	.202
	Non-Govt	149	14.09	2.628	.215
Raw score_PCn	Govt	151	10.65	2.127	.173
	Non-Govt	149	11.56	2.179	.179
Raw score_CD	Govt	151	88.73	12.263	.998
	Non-Govt	149	90.24	11.929	.977
Raw score_VC	Govt	151	46.66	3.462	.282
	Non-Govt	149	47.44	3.574	.293
Raw score_LN	Govt	151	13.21	2.453	.200
	Non-Govt	149	14.07	2.623	.215
Raw score_MR	Govt	151	11.38	3.017	.246
	Non-Govt	149	12.38	3.070	.252
Raw score_SS	Govt	151	38.48	5.827	.474
	Non-Govt	149	41.95	5.452	.447

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Raw score_reading	Equal variances assumed	.785	.376	-1.625	298	.105	-.800	.493	-1.770	.169
	Equal variances not assumed			-1.625	297.991	.105	-.800	.493	-1.770	.169
Raw score_BD	Equal variances assumed	.001	.981	-1.180	298	.239	-1.277	1.083	-3.408	.853
	Equal variances not assumed			-1.180	297.999	.239	-1.277	1.082	-3.408	.853
Raw score_SI	Equal variances assumed	.083	.773	-.538	298	.591	-.146	.271	-.680	.388
	Equal variances not assumed			-.539	298.000	.591	-.146	.271	-.680	.388

Raw score_DS	Equal variances assumed	1.228	.269	-3.146	298	.002	-.928	.295	-1.509	-.348
	Equal variances not assumed			-3.145	296.537	.002	-.928	.295	-1.509	-.347
Raw score_PCn	Equal variances assumed	.116	.734	-3.653	298	.000	-.908	.249	-1.397	-.419
	Equal variances not assumed			-3.652	297.576	.000	-.908	.249	-1.397	-.419
Raw score_CD	Equal variances assumed	.002	.966	-1.083	298	.280	-1.513	1.397	-4.262	1.236
	Equal variances not assumed			-1.083	297.939	.280	-1.513	1.397	-4.262	1.236
Raw score_VC	Equal variances assumed	.853	.356	-1.938	298	.054	-.787	.406	-1.587	.012
	Equal variances not assumed			-1.938	297.392	.054	-.787	.406	-1.587	.012

Raw score_LN	Equal variances assumed	1.322	.251	-2.963	298	.003	-.869	.293	-1.445	-.292
	Equal variances not assumed			-2.961	296.096	.003	-.869	.293	-1.446	-.291
Raw score_MR	Equal variances assumed	.140	.709	-2.822	298	.005	-.992	.351	-1.683	-.300
	Equal variances not assumed			-2.821	297.720	.005	-.992	.352	-1.683	-.300
Raw score_SS	Equal variances assumed	.943	.332	-5.323	298	.000	-3.469	.652	-4.752	-2.187
	Equal variances not assumed			-5.326	297.163	.000	-3.469	.651	-4.752	-2.187

T-Test

Group Statistics

	sex	N	Mean	Std. Deviation	Std. Error Mean
Raw score_reading	male	149	22.38	4.171	.342
	female	151	22.67	4.389	.357
Raw score_BD	male	149	31.93	9.509	.779
	female	151	32.65	9.272	.755
Raw score_SI	male	149	13.42	2.366	.194
	female	151	13.51	2.338	.190
Raw score_DS	male	149	13.54	2.606	.213
	female	151	13.70	2.587	.211
Raw score_PCn	male	149	10.87	2.185	.179
	female	151	11.32	2.193	.178
Raw score_CD	male	149	89.03	12.135	.994
	female	151	89.92	12.093	.984
Raw score_VC	male	149	46.94	3.585	.294
	female	151	47.15	3.492	.284
Raw score_LN	male	149	13.56	2.582	.212
	female	151	13.71	2.568	.209
Raw score_MR	male	149	11.62	2.992	.245
	female	151	12.13	3.151	.256
Raw score_SS	male	149	39.67	5.953	.488
	female	151	40.72	5.813	.473

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Raw score_ reading	Equal variances assumed	.298	.586	-.593	298	.554	-.293	.494	-1.266	.680
	Equal variances not assumed			-.593	297.582	.554	-.293	.494	-1.266	.680
Raw score_BD	Equal variances assumed	.031	.861	-.667	298	.506	-.723	1.084	-2.857	1.411
	Equal variances not assumed			-.667	297.556	.506	-.723	1.084	-2.857	1.411
Raw score_SI	Equal variances assumed	.118	.731	-.346	298	.730	-.094	.272	-.628	.441
	Equal variances not assumed			-.346	297.810	.730	-.094	.272	-.628	.441
Raw score_DS	Equal variances assumed	.002	.960	-.506	298	.613	-.152	.300	-.742	.438
	Equal variances not assumed			-.506	297.874	.613	-.152	.300	-.742	.438
Raw score_PCn	Equal variances assumed	.179	.673	-1.788	298	.075	-.452	.253	-.949	.045
	Equal variances not assumed			-1.788	297.971	.075	-.452	.253	-.949	.045
Raw score_CD	Equal variances assumed	.138	.711	-.634	298	.527	-.887	1.399	-3.640	1.866
	Equal variances not assumed			-.634	297.916	.527	-.887	1.399	-3.640	1.866
Raw score_VC	Equal variances assumed	.044	.833	-.521	298	.603	-.213	.409	-1.017	.591
	Equal variances not assumed			-.520	297.533	.603	-.213	.409	-1.017	.592
Raw score_LN	Equal variances assumed	.000	.992	-.487	298	.626	-.145	.297	-.730	.440
	Equal variances not assumed			-.487	297.895	.627	-.145	.297	-.730	.440

Raw score_MR	Equal variances assumed	.566	.452	-1.451	298	.148	-.515	.355	-1.213	.183
	Equal variances not assumed			-1.452	297.564	.148	-.515	.355	-1.213	.183
Raw score_SS	Equal variances assumed	.200	.655	-1.547	298	.123	-1.051	.679	-2.388	.286
	Equal variances not assumed			-1.546	297.588	.123	-1.051	.679	-2.388	.286

T-Test

Group Statistics

	roll no	N	Mean	Std. Deviation	Std. Error Mean
Raw score_reading	top10	149	21.70	4.136	.339
	bottom 10	151	23.34	4.272	.348
Raw score_BD	top10	149	39.90	4.914	.403
	bottom 10	151	24.78	6.111	.497
Raw score_SI	top10	149	13.32	2.425	.199
	bottom 10	151	13.60	2.269	.185
Raw score_DS	top10	149	15.46	2.335	.191
	bottom 10	151	11.80	1.149	.094
Raw score_PCn	top10	149	12.41	1.581	.130
	bottom 10	151	9.81	1.942	.158
Raw score_CD	top10	149	100.81	5.708	.468
	bottom 10	151	78.30	2.519	.205
Raw score_VC	top10	149	46.21	2.511	.206

	bottom 10	151	47.87	4.161	.339
Raw score_LN	top10	149	15.47	2.315	.190
	bottom 10	151	11.83	1.124	.091
Raw score_MR	top10	149	14.01	2.503	.205
	bottom 10	151	9.77	1.940	.158
Raw score_SS	top10	149	45.14	3.100	.254
	bottom 10	151	35.32	3.413	.278

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Raw score_ reading	Equal variances assumed	.137	.712	-3.377	298	.001	-1.640	.486	-2.595	-.684
	Equal variances not assumed			-3.378	297.891	.001	-1.640	.485	-2.595	-.684
Raw score_BD	Equal variances assumed	15.072	.000	23.594	298	.000	15.118	.641	13.857	16.379
	Equal variances not assumed			23.628	286.362	.000	15.118	.640	13.859	16.377

Raw score_SI	Equal variances assumed	.216	.642	-1.035	298	.302	-.281	.271	-.814	.253
	Equal variances not assumed			-1.034	296.109	.302	-.281	.271	-.814	.253
Raw score_DS	Equal variances assumed	65.770	.000	17.267	298	.000	3.662	.212	3.244	4.079
	Equal variances not assumed			17.197	215.054	.000	3.662	.213	3.242	4.081
Raw score_PCn	Equal variances assumed	7.935	.005	12.715	298	.000	2.601	.205	2.199	3.004
	Equal variances not assumed			12.733	287.686	.000	2.601	.204	2.199	3.004
Raw score_CD	Equal variances assumed	49.956	.000	44.293	298	.000	22.514	.508	21.514	23.514
	Equal variances not assumed			44.093	202.935	.000	22.514	.511	21.507	23.521
Raw score_VC	Equal variances assumed	29.646	.000	-4.158	298	.000	-1.653	.397	-2.435	-.871
	Equal variances not assumed			-4.171	247.034	.000	-1.653	.396	-2.433	-.872
Raw score_LN	Equal variances assumed	63.102	.000	17.369	298	.000	3.642	.210	3.229	4.055
	Equal variances not assumed			17.297	213.475	.000	3.642	.211	3.227	4.057

Raw score_MR	Equal variances assumed	.877	.350	16.382	298	.000	4.232	.258	3.724	4.740
	Equal variances not assumed			16.355	278.799	.000	4.232	.259	3.723	4.741
Raw score_SS	Equal variances assumed	4.814	.029	26.068	298	.000	9.816	.377	9.075	10.558
	Equal variances not assumed			26.085	295.980	.000	9.816	.376	9.076	10.557

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Raw score_reading	22.52	4.278	300
Raw score_BD	32.29	9.382	300
Raw score_SI	13.46	2.348	300
Raw score_DS	13.62	2.593	300
Raw score_PCn	11.10	2.197	300
Raw score_CD	89.48	12.102	300
Raw score_VC	47.05	3.535	300
Raw score_LN	13.64	2.572	300
Raw score_MR	11.88	3.079	300
Raw score_SS	40.20	5.897	300

Correlations

		Raw score_reading	Raw score_BD	Raw score_SI	Raw score_DS	Raw score_PCn	Raw score_CD	Raw score_VC	Raw score_LN	Raw score_MR	Raw score_SS
Raw score_ reading	Pearson Correlation	1	-.147*	.033	-.121*	-.056	-.139*	.069	-.126*	-.068	-.103
	Sig. (2-tailed)		.011	.572	.036	.330	.016	.231	.029	.242	.075
	N	300	300	300	300	300	300	300	300	300	300
Raw score_BD	Pearson Correlation	-.147*	1	.018	.546**	.613**	.787**	-.234**	.549**	.657**	.747**
	Sig. (2-tailed)	.011		.762	.000	.000	.000	.000	.000	.000	.000
	N	300	300	300	300	300	300	300	300	300	300
Raw score_SI	Pearson Correlation	.033	.018	1	-.088	.017	-.072	.123*	-.077	.031	.000
	Sig. (2-tailed)	.572	.762		.128	.770	.212	.034	.182	.592	.994
	N	300	300	300	300	300	300	300	300	300	300
Raw score_DS	Pearson Correlation	-.121*	.546**	-.088	1	.465**	.693**	-.116*	.982**	.596**	.645**
	Sig. (2-tailed)	.036	.000	.128		.000	.000	.045	.000	.000	.000
	N	300	300	300	300	300	300	300	300	300	300
Raw score_PCn	Pearson Correlation	-.056	.613**	.017	.465**	1	.617**	-.063	.462**	.584**	.650**
	Sig. (2-tailed)	.330	.000	.770	.000		.000	.276	.000	.000	.000
	N	300	300	300	300	300	300	300	300	300	300

Raw score_CD	Pearson Correlation	-.139*	.787**	-.072	.693**	.617**	1	-.182**	.699**	.724**	.837**
	Sig. (2-tailed)	.016	.000	.212	.000	.000		.002	.000	.000	.000
	N	300	300	300	300	300	300	300	300	300	300
Raw score_VC	Pearson Correlation	.069	-.234**	.123*	-.116*	-.063	-.182**	1	-.114*	-.116*	-.135*
	Sig. (2-tailed)	.231	.000	.034	.045	.276	.002		.048	.044	.019
	N	300	300	300	300	300	300	300	300	300	300
Raw score_LN	Pearson Correlation	-.126*	.549**	-.077	.982**	.462**	.699**	-.114*	1	.601**	.639**
	Sig. (2-tailed)	.029	.000	.182	.000	.000	.000	.048		.000	.000
	N	300	300	300	300	300	300	300	300	300	300
Raw score_MR	Pearson Correlation	-.068	.657**	.031	.596**	.584**	.724**	-.116*	.601**	1	.710**
	Sig. (2-tailed)	.242	.000	.592	.000	.000	.000	.044	.000		.000
	N	300	300	300	300	300	300	300	300	300	300
Raw score_SS	Pearson Correlation	-.103	.747**	.000	.645**	.650**	.837**	-.135*	.639**	.710**	1
	Sig. (2-tailed)	.075	.000	.994	.000	.000	.000	.019	.000	.000	
	N	300	300	300	300	300	300	300	300	300	300

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Regression (VCI)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Raw score_VC, Raw score_SI[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: reading comprehension test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.076[a]	.006	.000	.795

a. Predictors: (Constant), Raw score_VC, Raw score_SI

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.082	2	.541	.855	.426[a]
	Residual	187.835	297	.632		
	Total	188.917	299			

a. Predictors: (Constant), Raw score_VC, Raw score_SI

b. Dependent Variable: reading comprehension test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.020	.643		3.144	.002
	Raw score_SI	.000	.020	-.001	-.022	.983
	Raw score_VC	.017	.013	.076	1.301	.194

a. Dependent Variable: reading comprehension test

Regression (PRI)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Raw score_MR, Raw score_PCn, Raw score_BD[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: reading comprehension test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

1	.165[a]	.027	.017	.788

a. Predictors: (Constant), Raw score_MR, Raw score_PCn, Raw score_BD

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.152	3	1.717	2.766	.042[a]
	Residual	183.764	296	.621		
	Total	188.917	299			

a. Predictors: (Constant), Raw score_MR, Raw score_PCn, Raw score_BD

b. Dependent Variable: reading comprehension test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.233	.240		13.463	.000
	Raw score_BD	-.015	.007	-.181	-2.212	.028
	Raw score_PCn	.000	.028	-.003	-.035	.972
	Raw score_MR	.008	.021	.029	.368	.713

a. Dependent Variable: reading comprehension test

Regression (WMI)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Raw score_LN, Raw score_DS[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: reading comprehension test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.115[a]	.013	.007	.792

a. Predictors: (Constant), Raw score_LN, Raw score_DS

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.485	2	1.243	1.980	.140[a]
	Residual	186.431	297	.628		
	Total	188.917	299			

a. Predictors: (Constant), Raw score_LN, Raw score_DS

b. Dependent Variable: reading comprehension test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.288	.247		13.288	.000
	Raw score_DS	.033	.093	.107	.354	.724
	Raw score_LN	-.067	.094	-.218	-.720	.472

a. Dependent Variable: reading comprehension test

Regression (PSI)

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Raw score_SS, Raw score_CD[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: reading comprehension test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

1	.150[a]	.023	.016	.789

a. Predictors: (Constant), Raw score_SS, Raw score_CD

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.259	2	2.129	3.425	.034[a]
	Residual	184.658	297	.622		
	Total	188.917	299			

a. Predictors: (Constant), Raw score_SS, Raw score_CD

b. Dependent Variable: reading comprehension test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.708	.344		10.774	.000
	Raw score_CD	-.008	.007	-.126	-1.200	.231
	Raw score_SS	-.004	.014	-.028	-.266	.790

a. Dependent Variable: reading comprehension test