Metacognitive Strategies and Logical/Mathematical Intelligence in EFL Context: Investigating Possible Relationships

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Abstract—The current study aimed to investigate the possible relationship between logical/mathematical intelligence and metacognitive strategies Iranian EFL learners used in their reading comprehension process. To this end, 98 students (55 females and 43 males) who were all EFL learners participated in our study. We used MIDAS (multiple intelligences development assessment scales) in order to measure the students’ logical/mathematical intelligence. Furthermore, to measure the metacognitive strategies they applied, MASRI (Metacognitive Awareness of Reading Strategies Inventory) was used. Using Pearson correlation, we analyzed the obtained data. Data analysis revealed that logical/mathematical intelligence had a significant relationship with metacognitive strategies in EFL context. Moreover, males and females, except for logical/mathematical intelligence usage, didn't have any significant difference in the application of metacognitive strategies.

Index Terms—logical/mathematical intelligence, metacognitive strategies, the MIDAS, MASRI

I. INTRODUCTION
A. Statement of the Problem
According to Brown (1978) and Flavell (1976), metacognition is one of the basic predictors of learning. In other word, metacognition plays a significant role in language learning process (Brown, 1978; Wang, Haertel & Walberg, 1990, 1993; Flavell, 1976). Furthermore, it's believed that metacognitive strategies applied by language learners are crucially influenced by intellectual skills in general and logical/mathematical intelligence in particular (Slife, B. D., Weiss, J., & Bell, T., 1985). The current study tries to investigate the possible relationship between metacognitive strategies and logical/mathematical intelligence. Moreover, it tries to investigate the possible effects of gender on the abovementioned relationship.

B. Significance of the Study
In the twentieth century where individual differences and values play a crucial role in language learning, it's extremely important to teach learners strategies in line with their characteristics (Akbari & Hosseini 2008). It's believed that logically and mathematically intelligent learners are better users of metacognitive strategies in problem-solving activities. Moreover, male-female differences are assumed to have a significant role in the learning process. Anyway, the current study investigates the extent to which Iranian EFL learners make use of logical/mathematical intelligence and metacognitive strategies in their reading comprehension process; it also tries to investigate sex differences regarding the abovementioned relationship.

C. Research Questions and Hypotheses
The present study will try to investigate the following research questions:
1. Is there any significant relationship between logical/mathematical intelligence and metacognitive strategies Iranian EFL learners apply in their reading comprehension process?
2. Does gender have any effect on the abovementioned relationship?
   The abovementioned research questions are reworded to form the following null hypotheses:
   1. There is no significant relationship between logical/mathematical intelligence and metacognitive strategies of Iranian EFL learners.
   2. Gender doesn't have any effect on the abovementioned relationship.

II. REVIEW OF LITERATURE
As the basic purpose of the current study is to investigate the possible relationship between logical/mathematical intelligence and metacognitive strategies and the effect of gender on them, in the following part of the review of literature, first of all, we focus on logical/mathematical intelligence, and then metacognitive strategies will be dealt with. The last part of this section will focus on the possible relationship between logical/mathematical intelligence and metacognitive strategies.

A. Intelligence, Multiple Intelligences, Logical/Mathematical Intelligence

According to Elshout (1983), Intelligence is the property of human cognitive toolbox which functions basic cognitive operations. If we look back in the history, we can easily notice that intelligence and IQ tests have always been used to classify people as intelligent or unintelligent or specifically to pass value judgments about their social status (Mensch, 1991). In other word, IQ tests were used to attribute the failure or success of a particular group or race to its low or high IQ scores. Consequently, it caused racial discrimination among different races. Those with high IQ scores were regarded as the noble race and those with low IQ scores were regarded as the mean race (Howe, 1997). However, as time passed, Gardner (1983) questioned the construct validity of general cognitive ability or intelligence (Visser, Ashton & Vernon, 2006). He critically questioned the idea that it was just the presence or absence of g (intelligence) that made a person intelligent or unintelligent (Akbari & Hosseini, 2008). According to Gardner (1983), intelligence is conceived as “the biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture” (Kelly & Tanguay, 2006). Finally, Gardner (1983) proposed the Multiple Intelligences Theory. According to his theory, intelligence is a module having got different components which are more or less independent of one another. Gardner believes that it’s definitely incorrect to pass negative value judgment on a person and call him/her unintelligent just due to having a low score on IQ tests (Visser, Ashton & Vernon, 2006). He continues that each person possesses all eight intelligences: linguistic, logical/mathematical, spatial, musical, bodily/kinesthetic, interpersonal, intrapersonal & naturalistic intelligence. Below, we present a quick recapitulation of all eight intelligences as derived from Akbari & Hosseini (2008).

1. Linguistic intelligence: effective use of language and good knowledge of words.
3. Logical intelligence: effective use of numbers; ability to deduce conclusion.
4. Spatial intelligence: sensitivity to color & design & graphic forms.
5. Bodily intelligence: physical/ bodily coordination.
6. Interpersonal intelligence: ability to understand others, their intention and moods.
8. Natural intelligence: knowing and caring about nature.

According to Kelley & Tanguay (2006), the categories of multiple intelligences have got their own characteristics, tools and processes that represent different ways of thinking, solving problems and learning. According to Gardner (1983), each person possesses all eight intelligences to a certain degree. Moreover, each individual has the capacity to develop each intelligence to a certain degree; furthermore, as Armstrong (1994) points out, intelligences always interact with each other; in other word, in order to do something, let’s say cooking, different intelligences come together (ex. Linguistic, bodily/kinesthetic,…), letting us cook. It’s worth noticing to mention that Gardner (1983) believes that intelligences are not fixed and can be developed based on educational opportunities.

According to Veemana & Spaans (2005), logical/ mathematical intelligence is the core of MI theory and can be regarded as the true manifestation of MI. According to Gardner (1983), logical/ mathematical intelligence is the ability to use numbers effectively, to reason well and to recognize and solve problems using logical patterns. Having logical/mathematical intelligence, a person is able to categorize, infer and make generalizations; Moreover, as Visser, Ashton & Vernon (2006) point out, numerical facility is included in logical/mathematical intelligence. According to Gardner (1983), logically and mathematically intelligent individuals work well with abstract symbols such as geometrical shapes. Furthermore, a person who is logically intelligent is able to apply knowledge in different contexts, thinks logically and asks surprising questions. (Adey, Caspo, Demetiou, Hautam & Shayer, 2007). Moreover, individuals benefiting from logical/mathematical intelligence are assumed to appreciate activities like strategy games, math activities, logic puzzles, planning and arranging (Visser, Ashton & Vernon, 2006). Furnham (2006), asserting the intelligences proposed by Gardner, points out that spatial, linguistic and logical/mathematical intelligences are actually the essence of Multiple Intelligences Theory. He continues that among the categories of MI, just the traditional ones including spatial, linguistic and logical/intelligences are the best tools to assess an individual’s overall intelligence.

B. Language Learning Strategies; Metacognitive Strategies

According to Akbari & Hosseini (2008), it was Rubin (1975) who got familiar the field of second/foreign language learning with the concept of language learning strategies. Moreover MacIntyre and Gardner (1994), as cited in Doughty & Long (2003), propose that language learning strategies are the most important and fertile areas in research. Oxford (1989) defined language learning strategies as “behaviors or actions which learners use to make language learning more successful, self-directed and enjoyable” (p.235). She later proposed six basic components for language learning strategies which are known as Oxford’s taxonomy (Doughty & Long 2003). She classified language learning strategies as cognitive, memory, metacognitive, social, affective and compensation strategies. However, O’Malley & Chamot
(1990) altered Oxford’s taxonomy and shortened it to just three categories: cognitive, metacognitive and social/affective strategies.

Since metacognitive strategies are the basic focus of this section, we just try to concentrate on them and evaluate them in details.

It's believed that Flavell (1976) proposed the concept of metacognition for the first time (Memmun, D. S. & Akkaya, R., 2009). He defines metacognition as "individual's knowledge about his/her cognitive process, and employing this knowledge to inspect cognitive processes" (Flavell, 1976, p232). Schmitt (2002) refers to metacognitive strategies as those processes which language learners consciously use in order to monitor and manage their learning process. These strategies let language learners set goals for their learning, check how it's going on and furthermore, evaluate how they acted through the process of learning (Schmitt, 2002). Other researchers regarded metacognition as "thinking of thought" (Blakey, Spence, 1990; Livingston, 1997; Akin, Abaci & Cetin, 2007). As a matter of fact, they all considered regulation of cognition as the basic component of metacognition. According to Sanchez & Vovides (2007), those language learners who are aware of their metacognitive strategies are actually effective language learners and consequently succeed to promote their learning process. Cubukcu (2008) points out that the metacognitive strategies learners use consist of three basic parts, namely known as metacognitive knowledge, metacognitive monitoring and self-regulation and control. He continues that metacognitive knowledge is referred to cognitive strategies like memory strategies that language learners use to regulate their knowledge acquisition. The second group, metacognitive monitoring, refers to those activities language learners do to control and monitor their learning process; and finally, self-regulation, refers to activities used for managing the whole learning process. Other researchers summarized metacognitive strategies in the acronym CAPE; this specific acronym stands for centering, arranging, planning and evaluating the learning process (Birjandi, Abbasian & Mirhassani, 2005). They put emphasis on the metacognitive strategies used by language learners and further claim that individuals' success or failure in education is resulted from the presence or absence of these strategies. They continue that those language learners who are benefiting from metacognitive strategies can easily determine what they need to do and how to manage the situation; in other word, they have strategies to identify their needs and necessities in language learners who don't use metacognitive strategies are actually learners "without direction". He then continues that it's a little bit irritating for language learners to be controlled by others. So using metacognitive strategies, they can control and monitor their progress themselves (Wang, Spencer & Xing, 2009). Paris & Winograd (1990) believe that metacognitive strategies alter a passive learner to an active learner, helping him/her go beyond the limitations imposed by the instruction in order to control and manage their learning process through personal appraisal and management (Wang, Spencer & Xing, 2009). Senay (2009) asserts the crucial role of metacognitive strategies and further believes that using these strategies, language learners set goals for their own learning and consequently become effective and independent learners. He also claims that metacognitive strategies contain three basic skills, namely known as planning, monitoring and evaluation. As Visser, Ashton & Vernon (2006) point out, there is a close relationship between intrapersonal intelligence and metacognition. As they believe, individuals with high intrapersonal intelligence are aware of what they know and what they don't know. In other word, generally they are generally aware of their needs; using metacognitive strategies, they can easily self-direct their own learning and accurately judge their relative weakness and strength. Metacognitive strategies have the lion's share in the self-direction process which is an important process in problem-solving activities (Memmun, D. S. & Akkaya, R., 2009). It's claimed that strategic language learning which includes metacognitive strategies results in self-regulatory learning which is a desired goal for all language learners (Doughty & Long, 2003). As they point out, self-regulating learners are active participants of their learning process and can easily differentiate between what they know and what they don't know, resulting in the promotion of achievements. The last but not the least point in this section is that metacognitive strategies are recognized as the main predicaters of academic performance. Cubukcu (2009) asserts that those language learners that consistently monitor, control and manage their learning, can easily review and retain new information.learning process so that they can control and monitor it effectively. Graham (1997) emphasizes the significant role metacognitive strategies play in individuals' educational progress, adding that those

C. Logical/Mathematical Intelligence & Metacognitive Strategies: Possible Relationship

As it was already mentioned, the basic focus of the current study is to investigate to what extent logical/mathematical intelligence and metacognitive strategies are related together. However, it's claimed that logical/mathematical intelligence is the true manifestation of the Multiple Intelligences theory; in other word, MI theory is represented mostly through the logical/mathematical intelligence (Veemana & Spaanssa, 2005). So when we point to intellectual ability in this section, we mostly mean logical/ mathematical intelligence. Veeman & Verheij (2003) point out that there are three basic models to describe the possible relationship. The first model, namely known as "intelligence model", regards "metacognitive strategies as manifestation of intellectual ability". According to this model, intellectual ability and metacognitive strategies are cause and effect for each other and consequently can't stand freely as independent phenomena; this is in line with Sternberg’s triarchaic theory of intelligence (Veeman & Verheij, 2003). According to the second model, "contrasting model", intellectual ability and metacognitive strategies are totally independent predictors of learning; as it's clear, the proponents of this model assume that logical/mathematical intelligence which is a true representative of the MI theory is not related to metacognitive strategies and consequently they function independently. The last model, namely known as “mixed model”, assumes that metacognitive strategies and intellectual ability are
related together to a certain degree; later on metacognitive strategies occupy the top of intellectual ability. Therefore, metacognitive strategies are regarded as efficient tools for predicating the individuals’ learning (Veeman & Verheij 2003). Other researchers, like Stankov (2000), believe that metacognitive strategies are functioning independently of intellectual ability (Veeman & Spaansa 2005).

However, as Gardner (1983) cautions the components of MI are culture-bound; so researchers are advised to be extremely cautious when generalizing the outcomes to different cultures (Almeida, Prieto, Ferreria, Bermejo, Ferrando & Ferrandiz, 2010). Moreover, as Bayer (1990, 1998, 1999) points out, sex differences have been observed in the self-evaluation tasks related to intelligence; so researchers are suggested to be extremely conservative when generalizing the outcomes of gender differences to different social and psychological realms (Furnham, 2001).

III. METHOD

A. Participants

Ninety eight EFL learners of English at Tarbiat Moallem University participated in this study; 55 females and 43 males were involved in our study. They aged within 18 to 23. They were all studying English at intermediate and upper-intermediate levels.

B. Instrumentation

In order to measure students' logical/mathematical intelligence, the Persian version of MIDAS (multiple intelligences development assessment scales) (See Appendix A) was utilized. To avoid the possible problems related to students’ language proficiency, the Persian equivalent of the logical/mathematical intelligence was administered among the students. It contained 17 likert type questions. Moreover, we used the Persian version of MARSI (Metacognitive Awareness of Reading Strategies Inventory) (See Appendix C) to measure their metacognitive strategies. This questionnaire contained 30 questions which assessed students' global, supportive and problem solving strategies. Again, the Persian equivalent of the test was utilized to avoid any possible complexity on the part of students.

C. Procedure

We used two questionnaires to measure both logical/mathematical intelligence and metacognitive strategies Iranian EFL learners used in their reading comprehension process; first of all, all the 98 students were asked to answer the logical/mathematical intelligence test. The test contained likert-type questions and the subjects were assumed to choose the best answer based on their desire and interest. The questions were all related to problem-solving activities that measured the subjects’ logics, planning, and mathematical ability. Furthermore, in order to investigate what sort of metacognitive strategies they used in their reading comprehension process, they were requested to answer a questionnaire of metacognitive strategies. This test, again, contained likert-type questions which primarily focused on three basic metacognitive strategies namely as global reading strategies, problem solving strategies and supportive reading strategies. Moreover, all of the subjects were asked to specify their gender because the effect of gender was under investigation and crucially influenced the outcomes of our study. Later, using Pearson correlation, we analyzed the data obtained from each individual participant; using Pearson correlation, we analyzed the obtained data and it was revealed that logical/mathematical intelligence had a significant relationship with all levels of metacognitive strategies students may apply in their reading comprehension process.

IV. RESULTS AND DISCUSSION

As table No.1 shows, logical/mathematical intelligence proved to have a significant relationship with metacognitive strategies Iranian EFL learners applied in their reading comprehension process. The above-mentioned relation is 0.596 which is significant (p<.001). In other words, those students who apply logical/mathematical intelligence do apply metacognitive strategies while reading and are regarded to be better problem solvers. Considering the relationship between logical/mathematical intelligence and each of the metacognitive strategies sub-skills, it's noteworthy to mention that logical/mathematical intelligence had a significant relationship with problem solving strategies(r=.428), global reading strategies (r=.345) and supportive reading strategies (r=.381). As the following table shows, regarding the correlation between logical/mathematical intelligence and each of the metacognitive strategies sub-skills, Pearson correlation can be summarized as p<.001, p<.01 and p<.001. Needless to mention, logical/mathematical intelligence had a stronger relationship with problem solving strategies (r=.428).
TABLE NO. 1: CORRELATION MATRIX FOR LOGICAL/MATHEMATICAL INTELLIGENCE AND METACOGNITIVE STRATEGIES

<table>
<thead>
<tr>
<th>Variable</th>
<th>LMI</th>
<th>PROB</th>
<th>GLOB</th>
<th>SUP</th>
<th>MCST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.428**</td>
<td>.345**</td>
<td>.381**</td>
<td>.596**</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.001</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>LMI</th>
<th>PROB</th>
<th>GLOB</th>
<th>SUP</th>
<th>MCST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.96</td>
<td>.264**</td>
<td>.699**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.348</td>
<td>.009</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>LMI</th>
<th>PROB</th>
<th>GLOB</th>
<th>SUP</th>
<th>MCST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.008</td>
<td>.619**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.935</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>LMI</th>
<th>PROB</th>
<th>GLOB</th>
<th>SUP</th>
<th>MCST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.610**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Considering males vs. females' performance, it's worth to mention that males surpassed females in the application of logical/mathematical intelligence. To put it differently, males and females didn't show any significant difference regarding the application of metacognitive strategies while males had a better performance in the application of logical/mathematical intelligence. Taking into account the mean for each group (M=85.88 for males and M=78.00 for females), our males' better performance is vividly depicted in the following table (T=2.181, P<.05).

TABLE 2: COMPARISON OF LOGICAL/MATHEMATICAL INTELLIGENCE IN MALES AND FEMALES

<table>
<thead>
<tr>
<th>Variable</th>
<th>males N</th>
<th>M</th>
<th>SD</th>
<th>females N</th>
<th>M</th>
<th>SD</th>
<th>df</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMI</td>
<td>43</td>
<td>85.88</td>
<td>18.28</td>
<td>55</td>
<td>78.00</td>
<td>17.33</td>
<td>96</td>
<td>2.181</td>
<td>.032</td>
</tr>
</tbody>
</table>

As Graph No.1 depicts clearly, males and females didn't show a sharp difference in the application of metacognitive strategies sub-skills namely global reading strategies, problem solving strategies and supportive reading strategies. However, regarding logical/mathematical intelligence, males' performance was better than females' performance.

V. CONCLUSION

The present study tried to investigate the existing of any possible relationship between logical/mathematical intelligence and metacognitive strategies Iranian EFL learners used in their reading comprehension process. Moreover, it also investigated the effect of gender on the relationship. We used MIDAS (multiple intelligences development assessment scales) in order to measure students’ logical mathematical intelligence. Furthermore, to measure the metacognitive strategies they used, MASRI (Metacognitive Awareness of Reading Strategies Inventory) was used. Using Pearson correlation, we analyzed the obtained data. Data analysis revealed that logical/ mathematical intelligence had a significant relationship with metacognitive strategies in EFL context. Moreover, males and females, except for logical/mathematical intelligence usage, didn't have any significant difference in the application of metacognitive strategies. Although we found a significant relationship, caution should be observed in generalizing the outcomes to other situations in other contexts. In other word, the results show that it's definitely necessary to conduct more studies with larger samples in order to make it possible to generalize our outcomes.

در دوران مدرسه آیا شا نسبت به ریاضيات علاقه‌یا مهارت ویژه‌ای داشت؟

در مورد ریاضيات پیشرفته مانند جبر حساب دیفرانسیل و انتگرال چه طور؟

آیا شا به مطالعه علمی چیزی جال مربوط به آن علاقه‌یا نداشت؟

آیا شا شرط بندی یا چکره‌ای را خوب بازی می‌کرد؟

آیا شا در انواع بازی‌های کارتی و یا فکری موفق بود؟

آیا شا معمولاً حروف می‌کرد و یا بازی‌های شیشه‌ای به جدول را دوست داشت؟

آیا شا بهترین فرماندار بود؟

آیا شا هنگام خوابی برای کراز کردن حسابهای یک دسته چک و یا رسم یک طرح بوده بود؟

آیا شا حافظه خوبی در یه خاطر سیره‌ای اعداد مثل شا تلقین یا آدرس دارد؟

شاید عمومی اعداد در ذهن‌تان (به طور ذهنی) چگونه هستید؟

مرکز 2 به ندرت 3 کاهش 4 اغلب 5 عالی 6

آیا شا یک نسیم خوبی کرد؟

آیا شا یک نسیم خوبی کرد؟

آیا شا یک نسیم خوبی کرد؟

آیا شا یک نسیم خوبی کرد؟

آیا شا یک نسیم خوبی کرد؟
**APPENDIX B. METACOGNITIVE AWARENESS OF READING STRATEGIES INVENTORY (Marsi) Version 1.0**

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**DIRECTIONS:** Listed below are statements about what people do when they read academic or school-related materials such as textbooks, library books, etc. Five numbers follow each statement (1, 2, 3, 4, 5) and each number means the following:

- 1 means “I never or almost never do this.”
- 2 means “I do this only occasionally.”
- 3 means “I sometimes do this.” (About 50% of the time.)
- 4 means “I usually do this.”
- 5 means “I always or almost always do this.”

After reading each statement, circle the number (1, 2, 3, 4, or 5) that applies to you using the scale provided. Please note that there is no right or wrong answer to the statements in this inventory.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>STRATEGIES</th>
<th>SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLOB</td>
<td>1. I have a purpose in mind when I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>2. I take notes while reading to help me understand what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>3. I think about what I know to help me understand what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>4. I preview the text to see what it’s about before reading it.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>5. When text becomes difficult, I read aloud to help me understand what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>6. I summarize what I read to reflect on important information in the text.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>7. I think about whether the content of the text fits my reading purpose.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>8. I read slowly but carefully to be sure I understand what I’m reading.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>9. I discuss what I read with others to check my understanding.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>10. I skim the text first by noting characteristics like length and organization.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>11. I try to get back on track when I lose concentration.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>12. I underline or circle information in the text to help me remember it.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
### PROB
- 13. I adjust my reading speed according to what I’m reading.
- 15. I use context clues to help me better understand what I’m reading.
- 16. When text becomes difficult, I pay closer attention to what I’m reading.
- 17. I try to picture or visualize information to help remember what I read.
- 18. I stop from time to time and think about what I’m reading.
- 19. I critically analyze and evaluate the information presented in the text.
- 20. I paraphrase (restate ideas in my own words) to better understand what I read.
- 21. I try to picture or visualize information to help remember what I read.
- 22. I use typographical aids like bold face and italics to identify key information.
- 23. I adjust my reading speed according to what I’m reading.
- 24. I go back and forth in the text to find relationships among ideas in it.
- 25. I look for and use associations with ideas I know to help me understand new ideas.
- 26. I try to guess what the material is about when I read.
- 27. I use definition clues to help remember what I read.
- 28. I ask myself questions I like to have answered in the text.
- 29. I check to see if my guesses about the text are right or wrong.
- 30. I try to guess the meaning of unknown words or phrases.

### SUP
- 1. I try to guess what the material is about when I read.
- 2. I pay closer attention to what I’m reading.
- 3. I use reference materials such as dictionaries to help me understand what I read.
- 4. I try context clues to help me better understand what I’m reading.
- 5. I use glossaries and indexes that come with the text to learn new words.
- 6. I use context clues to help remember what I read.
- 7. I check my understanding when I come across conflicting information.
- 8. I re-read to increase my understanding.
- 9. I try to picture or visualize information to help remember what I read.
- 10. I check my understanding when I come across conflicting information.
- 11. I check my understanding when I come across conflicting information.
- 12. I try to picture or visualize information to help remember what I read.
- 13. I adjust my reading speed according to what I’m reading.
- 15. I use context clues to help remember what I read.
- 16. I try context clues to help remember what I read.
- 17. I check my understanding when I come across conflicting information.
- 18. I stop from time to time and think about what I’m reading.
- 19. I critically analyze and evaluate the information presented in the text.
- 20. I paraphrase (restate ideas in my own words) to better understand what I read.
- 21. I try to picture or visualize information to help remember what I read.
- 22. I use typographical aids like bold face and italics to identify key information.
- 23. I adjust my reading speed according to what I’m reading.
- 24. I go back and forth in the text to find relationships among ideas in it.
- 25. I use definition clues to help remember what I read.
- 26. I ask myself questions I like to have answered in the text.
- 27. I check to see if my guesses about the text are right or wrong.
- 28. I try to guess the meaning of unknown words or phrases.

### References


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