

Cognitive Style (risk-caution) and its Relationship to Meta-memory Skills among Secondary School Students in the District of South Hebron

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ABSTRACT : *The aim of this study is to determine the relationship between cognitive style (risk-caution) and the meta-memory skills among the secondary school students in the South Hebron district. To achieve the goal of the study, correlational approach, cognitive style measurement (risk-caution) and meta-memory measurement were used. The study was conducted on 295 students (male and female). The findings revealed that both the cognitive style level (risk-caution) and the meta-memory skills level were moderate, and that there was a statistically significant inverse negative relationship between the cognitive style level score (risk-caution) and meta-memory skills scores. The findings also revealed that there were no statistically significant differences between the means of the cognitive style (risk-caution) and the means of meta-memory skills attributed to gender, but there were statistically significant differences due to the grade in favor of Grade 11. According to the findings of the recent study, it is critical to establish a program which can develop the meta-memory skills among students, particularly those with moderate or low achievement.*

KEYWORDS - Cognitive Style, Risk-Caution, Meta-memory skills, Secondary School.

I. Introduction:

Cognitive styles are relatively new concepts in studies of mental processes and their application in the area of learner individual differences (Alferihi, 2001). The cognitive style (risk-caution) is one of the cognitive styles that influence how an individual think and how he behaves in various situations. Risk-takers are more inclined to adventure and challenging the unknown, are more self-confident, take advantage of opportunities, and are more capable in decision-making than cautious individuals who emphasize obtaining guarantees before embarking on adventures, prefer situations, and have no desire to challenge the unknown (Abu Allam and Sharif, 1983).

Students' behaviors differ in terms of memorizing, understanding, decision-making, and problem solving as a result of the pressures and problems they face due to individual differences in information processing processes, as these images direct the individual's cognitive activity, imposing a new cognitive style that allows us to reasonably predict the accurate type of behavior that can be performed by individuals who differ in their cognitive styles (Al-Atoum, 2004). The emotional components of cognitive style are related to the feelings that accompany the situations that the individual deals with, as well as its behavioral components that result from them, and the cognitive component that relates to the individual's awareness of his cognitive style (Al-Mousawi, 2004), (Muslim, 2007).

The memory is known to be the center of cognitive processes, influencing all other mental activities (Azayat, 2006), and it is the foundation of all psychological processes. Learning does not occur in their absence that is because human thinking lacks the previous experiences and acquired information on which he/she is based to learn (Ibraheem, 2013). Memory deficiency can also cause difficulties in the learning process or low achievement among learners who tend to guess or use ineffective learning strategies (McNamera. & Wong, 2003).

Memory familiarizes the student with the suitable strategies and different memory systems, which aids the student in completing all cognitive tasks efficiently. Given its significance and close relationship to the learning process, and because learning, thinking, and memory are intertwined processes that are difficult to be understood, the individual's life is a collection of educational situations, and the individual is not considered learning unless he is able to remember what he has learned (Ashkanani, 2013). According to Abu Ghazal (2007), meta-memory training improves daily life functioning by improving memory system knowledge, as it develops in students a better understanding and awareness of how memory works, as well as knowledge of appropriate memory strategies and different memory systems, which helps students to accomplish all cognitive tasks in an effective and efficient manner. Cognitive styles are one of the important factors that help students improve their memory by providing new meta-memory methods for sorting and retrieving information. This study is in line with recent cognitive psychology research. Meta-memory and working memory are two concepts that have piqued the interest to researchers from various disciplines (Rimawi, & Rimawi, 2020).

Previous research on the cognitive style (risk-caution), such as as (Rimawi & QURB, 2020), revealed differences in the cognitive style (risk-caution) due to the gender variable in favor of females, with no differences attributed to the accommodation or grade point average (GPA). The findings of Al-akayshi (2019) also showed that the cognitive style (caution) outweighed the cognitive style (risk) in favor of males. Hmoud and Nouri (2019) revealed a statistically significant difference in the cognitive style (risk - caution) based on specialization (scientific - humanitarian) in favor of the scientific specialization. According to a study of (Hafedh, et al., 2019), people with a cognitive risk-taking style are better able to learn the skills under study than people with a caution style. For studies on meta-memory, Al-Rabee' and Al-Shopoul (2019) and Salem (2018) found that Yarmouk University students had a moderate level of meta-memory as a whole. The findings also revealed that there were no statistically significant differences in the means of the participants' responses on the meta-memory measurement due to gender or academic level, but there were differences due to the GPA variable in favor of an excellent average. The findings of Abdullah's study (2018) revealed statistically significant differences in the memory processes attributed to the gender variable in favor of males as well as due to the academic major in favor of the scientific specialization, whereas Odai and Ghali, in their study (2017), revealed no significant differences in meta-memory level attributed to gender but there were statistically significant differences due to the grade variable in favor of Grade 4. Finally, the findings of a study conducted by Geurten, Lejeune, and Meulemans (2015) demonstrated that training improves children's ability to remember future events, as well as how the interaction of meta-memory and the use of strategies and executive functions improves children's ability to remember future events.

II. Problem of the study:

Cognitive style (risk-caution) is one of the styles that is distinct in its understanding; both domains (risk, caution) have distinct features and characteristics in their understanding method of, and both dimensions (risk, caution) have their own strategy in employing information in dealing with different environmental stimuli in how to practice different processes such as thinking, problem solving, learning and decision-making. The current study's problem is determined in identifying the important meta-memory topics for individuals at various academic levels, which may contribute to helping them face various life situations and circumstances. As it is an organized cognitive mental process in which the learner is an active participant in the learning process until his learning goal is achieved, revealing these aspects to school students helps students reinforce strategies and components of meta-memory.

III. Limitations of the study:

The following are the study's limitations:

Human limits: secondary school students.

Place limits: Southern Hebron district.

Time limits: school year (2020/2021)

Concept limits: this study is limited to the concepts and terms included in the study, which are the cognitive style (risk - caution), meta-memory skills.

IV. Terminology:

Cognitive style (risk-caution): "It is the extent to which the performance varies between individuals in their willingness to take risks and seize opportunities to achieve goals, compared to those who are cautious and tend to the traditional guaranteed situations and never take risks." (Muhsen, 2010:13)

Meta-memory: Troyer and Rich (2002: 22) defined it as "the individual's observation of his memory functions, his satisfaction with the daily functions that it performs, and the extent to which he uses various strategies and aids for remembering in life situations."

Procedural definition: It is the score that obtained by individuals on the meta-memory and cognitive style (risk-caution) measurements used in the current study.

V. Methods and procedures:

The procedures that were followed in conducting the current study, in terms of the used approach, describing the study population, defining the study sample, preparing the study instrument (a questionnaire), verifying its validity and reliability, stating the study procedures, and the statistical methods that were used to process the results. Below is a description for these procedures.

Approach of the study:

The researcher used the correlational approach to achieve the goals of the study, which is defined as the approach that studies an existing phenomenon, event or issue from which we can obtain information that answers the research questions without the researcher's intervention.

Population of the study and its sample:

The study's population included all secondary school students in the Southern Hebron district; it was conducted on 17 schools (6170 secondary school students). The study's sample consisted of (295) secondary school students from the Southern Hebron district who were chosen using the cluster sampling method. Table (3) shows the distribution of the participants.

Description of the participants' variables:

Table 1. Distribution of the participants in the study's sample due to study's variables.

| Variable | level | n (295) | n% |
|--------------------|----------|------------|------|
| Gender | Male | 127 | 43.1 |
| | female | 168 | 56.9 |
| Last grade average | > 75 | 54 | 18.3 |
| | 75-84 | 99 | 33.6 |
| | ≤85 | 142 | 48.1 |
| Grade | Grade 11 | 139 | 47.1 |
| | Grade 12 | 156 | 52.9 |

VI. Instrumentation:

After reviewing the educational literature related to the subject of the study and reviewing their instruments, the cognitive style measurement (risk-caution) developed by Hmoud and Nouri (2019) was used. The answer to one of the two alternatives (A, B) represents the (risk) style and the other alternative represents the (caution style), and two degrees are given to alternative (A) which represents (risk style) and one degree is given to the alternative (B) which represents the (caution style). The total score for the participant is calculated in this manner. To determine the overjet of the cognitive style (risk-caution) in the study's sample, the median, which was (46.5), was calculated based on measurement score ranging from (31-62); this corresponds to a mean (1.50), that is, the higher the score above this mean, the more it tends towards the risk-taking style, and the lower the score below this mean, the more it tends towards the caution style. The mean is equal to the sum of values divided by the number of values ($46.5/31 = 1.5$). Abd and Abbas (2019) meta-memory measurement was used; it consisted of 30 items, divided into three domains: memory performance reliability, evaluating memory capacity Skill, and memorialization strategies. All items represented the positive meta-memory trend, the participant was asked to estimate his/her answers on a five-point Likert scale, and the items were valued from 1 to 5.

Instrument validity:

A group of specialized and experienced arbitrators confirmed the study instrument's validity. The instrument's validity was also verified by calculating the Pearson correlation coefficient for the questionnaire items and the total score of the instrument. It was found that there was statistical significance in all the questionnaire items, indicating that there was internal consistency between the items.

Instrument reliability:

Instrument reliability was verified by calculating the reliability of the total score of the reliability coefficient of the study domains using the Cronbach's Alpha reliability equation, the total score for the cognitive style (risk - caution) was (0.748), and the level of meta-memory skills was (0.847), indicating that this tool has reliability that meets the study's objectives.

Data Analysis:

The means and standard deviations were extracted for each paragraph of the scale after verifying the validity and reliability of the study's instrument and ensuring its validity for statistical analysis using Cronbach Alpha, t-test, One Way ANOVA, the statistical packages (SPSS).

VII. Results:

Table 2. Pearson Correlation Coefficient and statistical significance between the cognitive style (risk-caution) and meta-memory skills among secondary school students.

| Variables | | R | Sig. |
|--------------------------------|----------------------------------|-------|------|
| Cognitive style (risk-caution) | Memory performance reliability | -0.15 | 0.00 |
| | Evaluating memory capacity Skill | 0.149 | 0.01 |
| | Memorialization strategies | 0.066 | 0.25 |
| | Total score | 0.173 | 0.00 |

Table (2) shows that the value of Pearson Correlation coefficient "R" of the total score was (-0.173), and the significance level was (0.003), revealing a statistically significant negative inverse relationship at the significance level ($\alpha \geq 0.05$) between the cognitive style (risk-caution) and meta-memory skills among secondary school students in the District of Southern Hebron, that is, the more the cognitive style tends to take risks, the lower the level of meta-memory skills among secondary school students in the District of Southern Hebron, and vice versa.

Table 3. Results of t-test of the independent samples of participants' responses between the means of cognitive style (risk-caution) among secondary school students based on the gender variable.

| Gender | No. | Mean | SD | "t" value | Sig. |
|--------|-----|------|------|-----------|------|
| Male | 127 | 1.40 | 0.13 | 1.06 | 0.29 |
| Female | 168 | 1.38 | 0.12 | | |

Table (3) shows that total score's "t" value was (1.06) and the significance level was (0.29), indicating that there were no differences between the means of the cognitive style (risk-caution) among secondary school students in the District of Southern Hebron attributed to the gender variable.

Table 4. Means and standard deviations of the participants' responses for the cognitive style (risk-caution) among secondary school students based on the last grade average variable.

| Last grade average | No. | Mean | SD | P value | Sig. |
|--------------------|-----|------|------|---------|------|
| >75 | 54 | 1.39 | 0.13 | 0.12 | 0.88 |
| 75-84 | 99 | 1.38 | 0.12 | | |
| ≤85 | 142 | 1.39 | 0.12 | | |

Table (4) shows that "P" value of the total score was (0.88), which is the greater than the significance level ($\alpha \geq 0.05$), indicating that there were no statistically significant differences between the means of the cognitive style (risk-caution) among secondary school students in the District of Southern Hebron due to the last grade average variable.

Table 5. Results of t-test of the independent samples of participants' responses between the means of cognitive style (risk-caution) among secondary school students based on the grade variable.

| Grade | No. | Mean | SD | "t" value | Sig. |
|----------|-----|------|------|-----------|------|
| Grade 11 | 139 | 1.38 | 0.12 | 1.47 | 0.14 |
| Grade 12 | 156 | 1.40 | 0.13 | | |

Table (5) shows that "t" value of the total score was (1.47) and the significance level (0.14), indicating that there were no differences between the means of the cognitive style (risk-caution) among secondary schools students in the District of Southern Hebron due to the grade variable.

Table 6. Results of t-test of the independent samples of participants' responses between the means of meta-memory skills among secondary school students based on the gender variable.

| Domain | Gender | No. | Mean | SD | "t" value | Sig. |
|--------------------------------|--------|-----|------|------|-----------|------|
| Memory performance reliability | Male | 127 | 3.17 | 0.48 | 0.29 | 0.77 |

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|----------------------------------|--------|-----|------|------|------|------|
| | Female | 168 | 3.15 | 0.44 | | |
| Evaluating memory capacity Skill | Male | 127 | 2.93 | 0.38 | 0.68 | 0.49 |
| | Female | 168 | 2.89 | 0.44 | | |
| Memorialization strategies | Male | 127 | 3.70 | 0.67 | 4.44 | 0.00 |
| | Female | 168 | 4.02 | 0.55 | | |
| Total score | Male | 127 | 3.27 | 0.33 | 2.29 | 0.02 |
| | Female | 168 | 3.36 | 0.33 | | |

Table (6) shows that “t” value of the total score was (2.29) and the significance level (0.02), indicating that there were differences between the means of meta-memory skills among secondary schools students in the District of Southern Hebron due to the gender and memorialization strategies in favor of females.

Table 7. Means and standard deviations (SD) of the participants’ responses for the level of meta-memory skills among secondary school students based on the last grade average variable.

| Domain | Last grade average | No. | Mean | SD | F value | Sig. |
|----------------------------------|--------------------|-----|------|------|---------|------|
| Memory performance reliability | >75 | 54 | 3.05 | 0.43 | 3.69 | 0.02 |
| | 84-75 | 99 | 3.12 | 0.46 | | |
| | ≤85 | 142 | 3.23 | 0.45 | | |
| Evaluating memory capacity Skill | >75 | 54 | 2.86 | 0.39 | 2.81 | 0.06 |
| | 84-75 | 99 | 2.85 | 0.42 | | |
| | ≤85 | 142 | 2.97 | 0.41 | | |
| Memorialization strategies | >75 | 54 | 3.82 | 0.70 | 3.44 | 0.03 |
| | 75-84 | 99 | 3.78 | 0.58 | | |
| | ≤85 | 142 | 3.98 | 0.61 | | |
| Total score | >75 | 54 | 3.24 | 0.31 | 7.31 | 0.00 |
| | 84-75 | 99 | 3.25 | 0.34 | | |
| | ≤85 | 142 | 3.39 | 0.32 | | |

Table (7) indicates that “f” value of the total score was (7.31) at the significance level (0.00) which is less than the significance level ($\alpha \geq 0.05$) that is there are statistically significant differences between the meta-memory skills among secondary schools students in the District of Southern Hebron due to last grade average in favor of (≤ 85).

Table 8. Results of t-test for the independent samples of the participants' responses between the means of meta-memory skills among secondary school students based on the grade variable.

| Domain | Grade | No. | Mean | SD | "t" value | Sig. |
|----------------------------------|----------|-----|------|------|-----------|------|
| Memory performance reliability | Grade 11 | 139 | 3.21 | 0.44 | 1.66 | 0.09 |
| | Grade 12 | 156 | 3.12 | 0.47 | | |
| Evaluating memory capacity Skill | Grade 11 | 139 | 2.92 | 0.37 | 0.46 | 0.64 |
| | Grade 12 | 156 | 2.90 | 0.45 | | |
| Memorialization strategies | Grade 11 | 139 | 4.00 | 0.49 | 2.90 | 0.00 |
| | Grade 12 | 156 | 3.79 | 0.71 | | |
| Total score | Grade 11 | 139 | 3.37 | 0.30 | 2.77 | 0.00 |
| | Grade 12 | 156 | 3.27 | 0.35 | | |

Table (8) shows that "t" value of the total score was (2.77) at a significance level (0.00), indicating that there were differences between the means of meta-memory skills among secondary school students in the District of Southern Hebron attributed to grade variable, and to the domain of memorialization strategies, with these differences were in favor of Grade 11.

VIII. Discussion:

According to the findings of the current study, there was a negative inverse relationship between the level of cognitive style (risk-caution) and meta-memory skills among secondary school students in the South Hebron District, and there were no differences between the means of the cognitive style (risk-caution) due to the gender variable. This result can be attributed to the students' social and cultural environment, as the parenting styles in dealing with the children, and the opportunities for social interaction are available to all of them. They are exposed the same educational situations in school. Furthermore, their teachers share a social environment. This finding is inconsistent with the findings of Mahmoud (2015), who found that there were differences between the means of cognitive style (risk - caution) based on the last grade average, and this was due to the fact that the cautious student compared to the risky student has low in mind-wandering or distraction, and he is also characterized by carefulness, caution, and independence in the classroom. This result was consistent with the findings of Allam's study (2018), whereas this result was inconsistent with the findings of Hammoud and Nouri (2017), who found differences between the means of meta-memory skills among secondary school students in the South Hebron District due to gender, as well as differences in the domain of memorization strategies, where the differences were in favor of females. We believe that the gender differences in performance on memory tasks were due to the fact that females use more strategies related to memory. They were more concerned with memory. This result was consistent with Abu-Ghazaleh (2007) who revealed differences attributed to the last grade average, and this result can be explained within the framework of cognitive components, control and meta-memory processes, as the more aware students about the tasks assigned to them, the better able they are to estimate the difficulty of the tasks, choose the activities they need to learn, the best way to remember them, and monitor their effect. This result was consistent with the study of Al-Rabee' and Al-Shaboul (2019), as well as Abu Muslim (2015). It was found that there were differences between the means of meta-memory skills due to the variable of grade in favor of Grade 11. This result may be attributed to the fact that the eleventh-grade students are characterized by stability and deliberation at this stage compared to the Tawjihi students who face greater pressures and challenges, which may lead to them losing focus in using memory skills as they should.

IX. Conclusion:

Cognitive styles are one of the recent topics that researchers in the field of Cognitive Psychology have begun to investigate. The concept of cognitive styles refers to the individual's way of dealing with information in terms of his way of thinking and his way of understanding and memorization, especially since students are not

exposed to such meta-memory exercises. To enhance their learning motivation and memory in general, as it was found that the level of the cognitive style (risk - caution) as well as the level of meta-memory skills were both medium, the findings also revealed that there were no differences in the cognitive style (risk - caution) due to the gender, the last grade average, or grade. Furthermore, there were no differences in meta-memory skills due to gender, but there were differences attributed to the last grade average, and they were in favor of the high average, and students who are older or with higher achievements, so it is necessary to establish programs to develop meta-memory skills for students, particularly those with low and medium achievement.

Conflict of interest: The authors declare no conflict of interest.

References:

- [1] Abd, Ehsan; Abbas, Qusay (2019). The Effect of the Science Writing Heuristic (SWH) on the Meta-memory of grade-five Biological Scientific Students. *Uruk Journal of the Humanities*, 12(2). 1123-1143.
- [2] Abdullah, Bahla (2018). Metacognitive Awareness of Reading Strategies and its Relationship to Memory Processes among Middle School Students. *Journal of Arab Studies in Education and Psychology*, No. (93), 173-207.
- [3] Abu Allam & Nadia Sharif (1983). *Individual Differences and their Educational Applications*, Kuwait, Dar Al-Qalam for printing.
- [4] Abu Ghazal, Muawiyah (2007). The Relationship Between Meta-memory and Academic Achievement Motivation among Yarmouk University Students. *The Jordanian Journal of Educational Sciences* 3(1), 105-89.
- [5] Akaishi, Bushra (2019). Cognitive Style and its Relationship to the control Position among Students of the University of Sharjah. *University of Sharjah Journal of Humanities and Social Sciences*, 16 (1), 95-125.
- [6] Al-Atoum, Adnan Youssef (2004). *Cognitive Psychology*, Amman, Dar Al-Masirah for printing and publishing.
- [7] Al-Farihi, Suleiman (2001) Self-sense and its Relationship to the Cognitive-Contemplative-impulsive Style among Middle School Students, Master's thesis, University of Baghdad, College of Education, Ibn Rushd.
- [8] Al-Moussawi, Abdullah (2004). *Thinking and Thinking Skills*. University Book, University of Baghdad, No. 2, 99-152.
- [9] Al-Rabee' Faisal & Al-ShbulIsraa (2019). Meta-memory and Academic Self-efficacy among Yarmouk University Students: A comparative study according to some variables. *Journal of the Association of Arab Universities for Research in Higher Education. Journal of the Union of Arab Universities - General Secretariat*, 39 (4), 109-130.
- [10] Ashkanani, Fatima Asad (2013). The Relationship Between Adopted Meta-memory Thinking/Future Cognitive Thinking among University Students in the Light of Some Variables. Master's Thesis (Unpublished), Faculty of Educational and Psychological Sciences, Amman Arab University.
- [11] El-Zayat, Fathi Mustafa (2006). *Cognitive Basis for Mental Formation and Information Processing (I 2)*. Cairo: Universities Publishing House.
- [12] Geurten, M, Lejeune, C, & Meulemans, T. (2015). Time's up ! Involvement of meta-memory knowledge executive functions, and time monitoring in children's prospective memory performance. *Child Neuropsychology* (ahead – of – print), 1-15.
- [13] Hafedh, H. F., Ali, A. H., & Hashim, Z. T. (2019). Effectiveness of Generative Learning Strategy for Those with Cognitive Style (Risk/Caution) in the Cognitive Achievement and Motor Compatibility and Learning the Reception Skill (Pass) of The Student in Volleyball. *Indian Journal of Public Health Research & Development*, 10(9). 1352-1357.
- [14] Hmoud, Iman; Nouri, Ahmed (2019). Cognitive Style (risk-caution) among Students of the University of Mosul. *College of Basic Education Research Journal*, 15 (3), 10-34.
- [15] Ibrahim, Solomon (2013). *Neuropsychological Basis of Cognitive and Metacognitive Processes and their Applications in the Field of Learning Difficulties*, Riyadh: Dar Al-Zahra.
- [16] McNamera, J. & Wong, B. (2003). Memory for everyday information in students with Learning disabilities. *Journal of Learning Disabilities*, 36(5), 394-406.

- [17] Mohsen, Basma Naim (2010). The Effect of Education According to the Metacognitive Strategy for Risk Takers Compared to Caution in Learning and Retaining Some Basic VolleyballSkills. Unpublished PhD thesis, College of Physical Education for Girls, University of Baghdad, Iraq.
- [18] Muslim, Zahra Ma Hood (2007). Cognitive Style (Organized, Intuitive) and its Relationship to Some Psychological Aspects of Modernization among University Students. Unpublished PhD thesis, College of Education for Girls, University of Baghdad, Iraq.
- [19] Rimawi, O., Halabyah, F., Husein, O. (2020). The Cognitive Style (Focusing-Scanning) among Al-Quds University Students. *international journal of humanities and cultural studies*, 7 (1), 143-154
- [20] Rimawi, O., Rimawi, A. (2020). Relationship Between Metacognitive Skills and Information Processing Skills Among Al-Quds University Students. *European Scientific Journal*, 16 (19), 262-273.
- [21] Rimawi, Omar, Al-Qurb& Nawaf (2020). Cognitive Style (risk - caution) among Secondary School Students in the Bedouin Region. *Journal of Social and Human Sciences*, 21 (2), 707-718.
- [22] Salem, Yasmine (2018). A Structural Model for meat-memory and its Relationship to Academic Self-regulation and Self-esteem among Students of the College of Education. *Psychological Counseling Journal*, No. (54), 181-233.
- [23] Shahin, M., Rimawi, O. (2020) Metacognitive Skills among Left-Handed Students in Al-Quds University. *International Journal of Research in Humanities and Social Studies*. 7 (6), 1-7.
- [24] Troyer, A. & Rich , J.(2002). Psychometric properties of Anew Meta memory Questionnaire for Older Adults ,*Journal of Gerontology Psychological Science* , 57b (1) ,19-27.
- [25] Uday Abdel-Zahra &GhaliSamaa (2017). Meat-memory for University Students. *Basrah Research Journal for Human Sciences*, 42(5), 125-140.