СЕКЦІЯ 2. ПЕДАГОГІЧНА ТА ВІКОВА ПСИХОЛОГІЯ

UDC 159.9.072:159.953.5
DOI https://doi.org/10.32999/ksu2312-3206/2021-1-8

BACKGROUND IN MEASURES OF METACOGNITIVE MONITORING

Avhustiuk Maria Mykolaivna,
Candidate of Psychological Sciences,
Associate Professor at the International Relations Department
National University of "Ostroh Academy"
maria.avgustiuk@gmail.com
https://orcid.org/0000-0001-8041-5078

Purpose. Of special importance of the current study is the observation of some theoretical and methodological aspects of the peculiarities of measures of metacognitive monitoring. In particular, we highlight some common in the psychological research approaches to the measures and discrepancies of metacognitive monitoring. We provide the description of the factors that can moderate metacognitive monitoring judgments accuracy, the reasons of its importance, the summary of three general classes of cues, and some significant studies about the measures of metacognitive monitoring. The types of outcome measures of metacognitive monitoring (such as absolute accuracy, relative accuracy, bias, scatter, and discrimination) are also analyzed. Moreover, we describe some major impacts of effective calibration on the assessment of subjective confidence.

Methods. The theoretical and comparative methods of studying metacognitive monitoring accuracy and peculiar nature of different measures of metacognitive monitoring have been taken into account. The necessity in studying such aspects of metacognitive monitoring accuracy measures has been caused by its impact on students' learning activity.

Results. Metacognitive monitoring is an important component of metacognition, as well as of self-regulated learning. The research provides hindsight into the background of metacognitive monitoring measures. The current intention was to describe some theoretical and methodological aspects of the accuracy and discrepancies of metacognitive judgments. The learners' ability to discriminate what is known and how it is possible to get to accurate knowledge judgments is an inevitable part of the learning process and is worthy further investigation in both psychological and educational studies.

Conclusions. The results of the theoretical analysis found in the study play a significant role in the studying of metacognitive monitoring of university students' learning activity. The peculiarities of measures of metacognitive monitoring are an important issue for future research.

Key words: *metacognitive monitoring, measures, absolute accuracy, relative accuracy, calibration.*

ОГЛЯД СПОСОБІВ ВИМІРЮВАННЯ МЕТАКОГНІТИВНОГО МОНІТОРИНГУ

Августюк Марія Миколаївна,
кандидат психологічних наук,
доцент кафедри міжнародних відносин
Національний університет «Острозька академія»
maria.avgustiuk@gmail.com
https://orcid.org/0000-0001-8041-5078

Мета. Стаття зосереджена на аналізі деяких теоретичних та методологічних аспектів огляду способів вимірювання метакогнітивного моніторингу. Зокрема, ми виділяємо деякі наявні в психологічних дослідженнях підходи до вивчення способів вимірювання точності та розбіжностей метакогнітивного моніторингу. Ми досліджуємо чинники, які можуть зменшити точність суджень метакогнітивного моніторингу, причини важливості питання, подаємо короткий аналіз трьох загальних класів підказок метакогнітивних суджень, а також опис цілої низки важливих досліджень щодо особливостей вимірювання точності метакогнітивного моніторингу. Також аналізуються види показників точності, що виникають у результаті здійснення суджень метакогнітивного моніторингу (це абсолютна точність, відносна точність, упередженість, розкид (розсіювання) значень та дискримінація). Навіть більше, ми описуємо деякі основні наслідки ефективного калібрування на оцінку суб'єктивної впевненості студентів.

Методи. У дослідженні використані теоретичні та порівняльні методи вивчення точності метакогнітивного моніторингу та способів її вимірювання. Необхідність вивчення таких аспектів цього питання зумовлена впливом точності метакогнітивного моніторингу на навчальну діяльність студентів.

Результати. Метакогнітивний моніторинг є важливим складником як метапізнання, так і саморегульованого навчання. У дослідженні здійснено огляд способів вимірювання метакогнітивного моніторингу. Метою було – здійснити аналіз особливостей способів вимірювання метакогнітивного моніторингу, описати деякі теоретичні та методологічні аспекти точності та розбіжностей метакогнітивних суджень. Здатність тих, хто навчається, розрізняти між тим, що відомо і що ні, а також способи сприяння точності метакогнітивних суджень, є невід'ємною частиною навчального процесу, і тому питання потребує подальшого вивчення.

Висновки. Результати теоретичного аналізу, виявлені в дослідженні, відіграють вагому роль у вивченні метакогнітивного моніторингу навчальної діяльності студентів. Врахування особливостей способів вимірювання метакогнітивного моніторингу є важливим для подальших досліджень.

Ключові слова: *метакогнітивний моніторинг, вимірювання, абсолютна точність, відносна точність, калібрування.*

Introduction

Metacognitive monitoring is a significant learning skill that is measured in judgments of learning. These are the judgments that aim to show whether you are approaching the correct solution to a problem and assessing how well you understand what you are learning (Dunlosky & Metcalfe, 2009). There exists accurate and inaccurate metacognitive monitoring. In the learning activity of university students the measure of the accuracy of metacognitive judgments of learning is of great importance as metacognitive monitoring judgments are important source for students' regulation of their cognitive activity during learning and performance (Ranalli, 2018; Thiede et al., 2003).

There are numerous studies of metacognitive monitoring accuracy measures and discrepancies that are common in psychological research (K. Bahbahani, E. Balashov, E. Bohomolova, L. Bol, J. Dunlosky, A. Fomin, D. Hacker, M. Händel, R. Kalamazh, F. Kuch, J. Metcalfe, T. Nelson, J. Nietfeld, I. Pasichnyk, J. Ranalli, G. Schraw, K. Thiede, A. Was, etc.), though, such measures are often incomplete. The findings highlight that no single measure can fully explain all the variance in metacognitive monitoring judgments. According to M. Händel et al. (2020), different metacognitive monitoring judgments and measures of judgment accuracy can help obtain comprehensive insights into metacognitive monitoring individual differences.

J. Ranalli (2018) points out that accurate metacognitive monitoring of one's own knowledge or performance can be regarded as a precondition for self-regulated learning. The author comes to the conclusion that monitoring informs metacognitive control, which, in turn, affects task outcomes. Moreover, rising learners' awareness of monitoring accuracy could benefit self-regulated learning.

Significantly, in psychological literature there have been found many factors that can moderate the accuracy of self-assessments. These are the amount of relevant prior knowledge possessed by participants (studies by J. Nietfeld, G. Schraw, and others), whether the knowledge assessed was generated or domain-specific one (studies by A. Glenberg, W. Epstein, and others), the difficulty of items (studies by G. Gigerenzer, U. Hoffrage, and H. Kleinbölting, etc.), and the stage of the learning process of monitoring accuracy (studies by C. Mengelkamp, M. Bannert, etc.).

Metacognitive monitoring accuracy can also be explored at the global and local levels. The results of the study by G. Schraw (1994) showed that the average and high self-appraised global monitoring judgments can be significantly more accurate than the local ones (Schraw, 1994; Nietfeld et al., 2005).

1. Theoretical substantiation of the problem

In the psychological literature there exists a lively debate that is centred on how to measure metacognitive judgments. G. Schraw (2009) takes the position that different outcome measures provide different types of information that complement one another. The author proposes that it is essential to understand different types of judgment measures in order to use them appropriately to pose and to answer useful research questions. Thus, metacognitive judgments taken into consideration are made before, during, or after task performance. There also play important role such broad categories as individual differences (e.g., working memory), task parameters (e.g., immediate versus delayed judgments of learning), and text and test parameters (e.g., length or familiarity of the material to be learned).

Analysis of psychological literature has shown that the question of measures of metacognitive monitoring still remains unresolved. There exists inconsistency between the authors on how to measure metacognitive monitoring to fully grasp all the peculiarities. Moreover, the distinction between absolute and relative accuracy is not enough to provide the insight into thorough analysis of metacognitive monitoring data. The importance of the use of the mixed method design is unquestionable, but some other ways to strengthen the analysis data are strongly needed.

Thus, the **aim** of the paper is a theoretical framework of some theoretical and methodological aspects of the hindsight in measures of metacognitive monitoring.

2. Methodology and methods

The theoretical and comparative methods of studying metacognitive monitoring accuracy and peculiar nature of different measures of metacognitive monitoring have been taken into account. The necessity in studying such aspects of metacognitive monitoring accuracy measures has been caused by its impact on students' learning activity.

3. Results and discussions

Metacognitive monitoring accuracy, according to J. Hattie (2013), and others, is important for a number of reasons. First of all, it aims at informing on the compatibility of new prior knowledge (e.g., inaccurate feeling of familiarity may lead to rejection of new knowledge as irrelevant or treating something old as new). Secondly, it can determine the level of effort needed according to task demands and experienced difficulty. Thirdly, it can trigger already available or effective strategies, as well as avoid use of new ones. Moreover, it can help a person realize the actual level of knowledge and make up a decision where he/she should be targeting. And finally, it can interfere with help seeking.

As metacognitive judgments are inferential in nature, these inferences are based on cues people have access to when judging performance (Händel et al., 2020). The cue-utilization approach was developed by A. Koriat (1997) and provides a theoretical model that is suitable to understand different causes of metacognitive judgments and their accuracy. The approach states that the accuracy of judgments depends on the availability of specific cues – information-based (or theory-based) (students might base their judgments on preconceived notions about competence, i.e., due to their self-concept beliefs, prior success in the respective domain, or time and effort spent for studying) and experience-based ones (the judgments are based on the concrete students' experiences during task processing).

In addition to experience-based cues, several individual factors might provide information-based cues related to the monitoring of personal understanding or performance. These are retrieval fluency, motivational and personal variables, individual test performance, gender, etc. (Händel et al., 2020).

Moreover, A. Koriat (1997) distinguishes between three general classes of cues for metacognitive judgments of learning: intrinsic, extrinsic, and mnemonic indicators. Thus, the intrinsic cues consist of the characteristics of the study items that are perceived to disclose the items' a priori ease or difficulty of learning. The extrinsic cues are the conditions of learning such as number of times an item has been studied, presentation time, massed versus distributed repetition of items, etc., as well the encoding operations applied by the learner (level of processing, interactive imagery, and so on). And, finally, to the mnemonic indicators the author highlights the accessibility of pertinent information, the ease with which information comes to mind, cue familiarity, the ease of processing of a presented item, the memory for its ease of acquisition, and the memory for the outcome of previous recall attempts.

Currently, there exist some significant studies about the measures of the accuracy of metacognitive monitoring. Thus, S. Tobias and H. Everson (2009) proposed four scores of the knowledge monitoring assessment scale aiming at learning how individual differences might influence accuracy of responses on a knowledge monitoring assessment. As the scale generates four scores that reflect the relationship between students' estimates of their knowledge and their test performance, the answers of the participants of the experimental study should be split into four-answer category groups: answers known and passed on the test (+ + scores or true positive scores); answers claimed as known but not passed (+ – scores or true negative scores); answers claimed as unknown but passed (– + scores or false positive scores); and answers claimed as unknown and not passed (– – scores or false negative scores). The + + and – – scores reflect accurate knowledge monitoring estimates, and the + – and – + scores reflect inaccurate estimates (the illusion of knowing or overconfidence and the illusion of not knowing or underconfidence levels accordingly). The knowledge monitoring assessment (KMA) aims to study systematically the empirical relationships between students' ability to monitor their knowledge states and their academic achievement, as well as the relationships with other important psychological constructs (i.e., motivation, anxiety, and self-regulated learning) (Tobias & Everson, 2009).

There is a number of ways to analyze the results of knowledge monitoring data (Schraw, 2009; Was, 2014, etc.). But the distinction is made between two main notions of effective metacognitive monitoring. These are absolute accuracy and relative accuracy.

G. Schraw (2009) describes five indices of metacognitive monitoring referred as absolute accuracy, relative accuracy, bias, scatter, and discrimination. The types of outcome measures of metacognitive monitoring adapted from G. Schraw (2009), C. Was (2014), J. Dunlosky and J. Metcalfe (2009), M. Händel et al. (2020), and many others, are shown in table 1.

Table 1

Types of outcome measures of metacognitive monitoring (adapted from G. Schraw (2009), C. Was (2014), J. Dunlosky and J. Metcalfe (2009), M. Händel et al. (2020), etc.)

Type of Measure		Outcome Measure	Outcome Measure Definition	Score Interpretation
Accuracy	Absolute accuracy	Absolute accuracy index (calibration)	The discrepancy (difference) between an individual's confidence judgment and objective performance.	It measures judgments precision (accuracy). In other words, calibration represents how closely a judgment of performance corresponds to actual performance.
	Relative accuracy	Relative accuracy index (resolution)	The relationship between a set of confidence judgments and performance scores.	It measures correspondence between confidence judgments (JOLs) and performance. In other words, resolution indicates whether metacognitive judgments of individual items predict performance relative to one another.
Bias		Bias index (Brier score, calibration bias, etc.)	The degree of over- or underconfidence in metacognitive judgments.	Calibration bias measures information about both the direction and magnitude of judgment error. The bias index is calculated for each participant by first taking the signed difference between the confidence judgment for each item and the performance on each item by participant. The difference scores are then averaged across items and participants. In other words, bias reflects the degree of underconfidence (negative bias values) or overconfidence (positive bias values) and is computed as the signed difference between performance *p i* and judgments *c i*, averaged over the *n* items.
Scatter		Scatter index	The degree to which an individual's judgments for correct and incorrect responses differs in terms of variability.	It measures differences in variability for confidence judgments for correct and incorrect items.
Discrimination		Discrimination index	The ability to discriminate between correct and incorrect outcomes.	It measures the discrimination between confidence for correct and incorrect items. In other words, discrimination captures the difference in accuracy for confidence of correct items versus confidence for incorrect items. Positive discrimination scores would indicate that you were more confident on items you recalled correctly than on non-recalled items.

Thus, absolute accuracy is the difference between the expected performance results and the actual test results. In preparation for the exam, when a student monitors his/her own competence with the help of accuracy judgments, it is decided when to suspend or to complete the learning process. Excessive confidence can lead to less time and effort than is actually required. Put differently, absolute accuracy index represents how closely a judgment of performance corresponds to actual performance. It is also known as calibration (Schraw, 2009; Was, 2014, etc.).

Relative accuracy is the accuracy of predicting the level of correctness of one task compared to another one. Relative accuracy indicators are a signal for decision-making on how to effectively allocate time between the processing of different parts of the learning material. Put differently, relative accuracy (also known as resolution) indicates whether an individual can differentiate between items that are known versus unknown (Schraw, 2009; Was, 2014; Nietfeld et al., 2005; etc.).

Bias index shows the degree of over- or underconfidence in judgments of learning

(Schraw, 2009; Was, 2014). Scatter and discrimination indices weren't developed fully because the novel metacognitive task doesn't produce a binary score.

The choice of which – a relative or absolute measure of metacognitive monitoring accuracy, according to J. Nietfeld et al. (2005), should be based on the context in which the measurement occurs. One should also take into account the primary goals of the study. For example, a measure of relative accuracy may be appropriate if a researcher is interested primarily in the extent to which an individual makes consistent judgments across items. If there is interest in changes in the accuracy related to intervention, training, or practice effects, a measure of absolute accuracy is more appropriate.

A noteworthy finding is that G. Schraw (2009) points out that no single item out of these five will allow for a complete understanding of the nature of metacognitive monitoring accuracy, as well as multiple components of metacognitive awareness. The author proposes a complementarily mixed method design in order to use the data to strengthen the analysis. This will provide a more complete understanding of the nature of the accuracy of metacognitive monitoring. In other words, the use of mixed method designs is important to understand metacognition in general, as well as metacognitive monitoring in particular.

The level of correspondence between the subjective confidence in the performance correctness and the objective performance of tasks is usually established with the help of a calibration procedure. A scale from 0% to 100% (most often there are restrictions on the use of six indicators – 0, 20, 40, 60, 80, and 100) or a score scale is used to assess subjective confidence. Students are most likely to attribute discrepancies between their scores and calibration judgments to how much or how well they study or how well they feel they know the material (Bol & Hacker, 2012).

An individual's calibration would be perfect if he/she predicted to answer 75% of the items on a test correctly and they did answer 75% of the items (no more, no less) correctly (Dunlosky & Metcalfe, 2009). That is, the coincidence of predictions and objective results is the result of successful calibration. The systematic errors in judgments (excessive confidence or lack of confidence) indicate that effective calibration did not occur (i.e., when the overall average judgment of accuracy is 88%, and the actual correctness of the tasks does not exceed 66%, the difference of 22% is an indicator for excessive confidence or the illusion of knowing) (Dunlosky & Metcalfe, 2009; Avhustiuk et al., 2018; etc).

Specifically, metacognitive judgments of correct performance may be based on feeling-of-knowing; consequently, judgments of incorrect performance may be based on the illusion of knowing (i.e., judgment heuristics may lead to different types of errors and calibration processes). These include failure to monitor memory or mistake to accurately process content in memory (Serra & Metcalfe, 2009).

Importantly, there exist a three-level model of calibration accuracy (Schraw et al., 2014): first-level (cognitive skill factors), second-level (correct performance factors, e.g., sensitivity, and incorrect performance factors, e.g., specificity), and third-level (general factors). Sensitivity is equivalent to the hit rate in signal detection theory; specificity is the complement of the false alarm rate. The interpretation of formula for each statistic data resembles the KMA scale, developed by S. Tobias and H. Everson. For a more detailed description see table 2.

Thus, sensitivity is the proportion of *yes* judgments when item is answered correctly; formula is a/(a + c). Specificity is the proportion of *no* judgments when item is answered incorrectly; formula is d/(b + d). *G* index is the difference between the proportion of concordant (true positive and true negative) and discordant (false positive and false negative); formula is (a + d) – (b + c)/(a + b + c + d). *Gamma* is the difference between product of concordant and discordant judgments divided by their sum; formula is (ad – bc)/(ad + bc) (Schraw et al., 2014).

And, finally, *d'* is the difference between standardized hit rate (a/(a + c)) and false alarm (b/(b + d)) rate; formula is z(a/(a + c)) – z(b/(b + d)) (Schraw et al., 2014). *d'* (or the discriminability index) is a theoretical value used in signal detection theory that measures how readily

Table 2

A 2 × 2 Performance-Judgment Data Array (Contingency) for Monitoring Accuracy (adapted from G. Schraw et al. (2014))

Monitoring Judgment		**Correct**	**Incorrect**
Correct		a (+ + or true positive)	b (– + or false positive)
Incorrect		c (– – or false negative)	d (+ – or true negative)
Marginal	**Column Marginal**	a + c	b + d
	Row Marginal	a + b	c + d

a signal can be detected (Was, 2014). It is shown like the *z* score of sensitivity minus the *z* score of the complement of specificity.

λ (response bias) is the degree to which an individual is over- or underconfident in his/her judgment. λ is a measure of an individual's predisposition to say 'yes' or 'no'. λ is the most direct way to describe the placement of the observer's criterion. But to interpret the criterion the relationship between λ and *d'* must be taken into account (e.g., if *d'* = .03 and λ = .05, this represents a bias toward *no* or *unknown* responses; if *d'* = 2.0 and λ = .05, this represents a bias toward *yes* or *known* responses) (Was, 2014).

Typically, research in calibration makes a distinction between calibration of comprehension and calibration of performance (studies by A. Glenberg, W. Epstein, J. Nietfeld, L. Cao, J. Osborne, etc.). Thus, calibration of comprehension is an individual's confidence estimate of his/her ability to answer a forthcoming question about the learning material or activity he/she has just encountered. Calibration of performance provides a confidence judgment for already produced answer. These estimates of monitoring accuracy differ primarily in their temporal relation to encountering a test problem. Calibration of comprehension estimates (made either at the local or at the global levels) precede test questions; calibration of performance estimates follow test questions. The advantage of calibration of performance estimates is that the learner is familiar with both the content and the task. Moreover, calibration of performance is regarded to be more accurate than calibration of comprehension (the findings by A. Glenberg, W. Epstein, R. Maki, and others).

Conclusions

Metacognitive monitoring is an important component of metacognition, as well as of self-regulated learning. The research provides hindsight into the background of metacognitive monitoring measures. The current intention was to describe some theoretical and methodological aspects of the accuracy of the discrepancies of metacognitive judgments. The learners' ability to discriminate what is known and how it is possible to get to accurate knowledge judgments is an inevitable part of the learning process and is worthy further investigation in both psychological and educational studies. Thus, we can assume that the results of the theoretical analysis found in the study play a significant role in the studying of metacognitive monitoring of university students' learning activity. The peculiarities of measures of metacognitive monitoring are an important issue for future research.

BIBLIOGRAPHY:

1. Avhustiuk M., Pasichnyk I., Kalamazh, R. The illusion of knowing in metacognitive monitoring: Effects of the type of information and of personal, cognitive, metacognitive, and individual psychological characteristics. *Europe's Journal of Psychology*, 2018. Vol. 14, № 2. Pp. 317–341.

2. Bol L., Hacker D. J. Calibration research: Where do we go from here? Frontiers in Psychology, 2012. Pp. 1–6.

3. Dunlosky J., Metcalfe J. Metacognition: A textbook for cognitive, educational, life span and applied psychology. USA: SAGE Publications, Inc., 2009. 344 p.

4. Hattie J. Calibration and confidence. *Learning and Instruction,* 2013. №. 24. Pp. 62–66.

5. Händel M., de Bruin A. B. H., Dresel M. Individual differences in local and global metacognitive judgments. *Metacognition and Learning*, 2020. № 15. Pp. 51–75.

6. Koriat A. Monitoring one's own knowledge during study: A cue-utilization approach to judgments of learning. Journal of Experimental Psychology: General, 1997. Vol. 126, № 4. Pp. 349–370.

7. Nietfeld J. L., Cao L., Osborne J. W. Metacognitive monitoring accuracy and student performance in the postsecondary classroom. *The Journal of Experimental Education*, 2005. Vol. 74, № 1. Pp. 7–28.

8. Ranalli J. Inaccurate metacognitive monitoring and its effects on metacognitive control and task outcomes in self-regulated L2 learning. *The Electronic Journal for English as a Second Language*, 2018. Vol. 21, № 4. Pp. 1–20.

9. Schraw G. The effect of metacognitive knowledge on local and global monitoring. *Contemporary Educational Psychology,* 1994. Vol. 19, № 2. Pp. 143–154.

10. Schraw G. A conceptual analysis of five measures of metacognitive monitoring. *Metacognition and Learning*, 2009. № 4. Pp. 33–45.

11. Schraw G., Kuch F., Gutierrez A., Richmond A. Exploring a three-level model of calibration accuracy. *Journal of Educational Psychology,* 2014. Pp. 1–11.

12. Serra M. J., Metcalfe J. Effective implementation of metacognition. In D. J. Hacker, J. Dunlosky, A. C. Graesser (Eds.), Handbook of Metacognition and Education. New York, NY : Routledge, 2009. Pp. 278–298.

13. Thiede K. W., Anderson M. C. M., Therriault D. Accuracy of metacognitive monitoring affects learning of text. *Journal of Educational Psychology*, 2003. Vol. 95, № 1. Pp. 66–73.

14. Tobias S., Everson H. T. The importance of knowing what you know: A knowledge monitoring framework for studying metacognition in education. The Educational Psychology Series. Handbook of Metacognition in Education, 2009. Pp. 107–127.

15. Was C. A. Discrimination in measures of knowledge monitoring accuracy. *Advances in Cognitive Psychology*, 2014. Vol. 10, № 3. Pp. 104–112.

REFERENCES:

1. Avhustiuk, M., Pasichnyk, I., & Kalamazh, R. (2018). The illusion of knowing in metacognitive monitoring: Effects of the type of information and of personal, cognitive, metacognitive, and individual psychological characteristics. *Europe's Journal of Psychology, 14*(2), 317–341.
2. Bol, L. & Hacker, D. J. (2012). Calibration research: Where do we go from here? *Frontiers in Psychology, 3*, 1–6.
3. Dunlosky, J. & Metcalfe, J. (2009). Metacognition: A textbook for cognitive, educational, life span and applied psychology. *USA: SAGE Publications, Inc.,* 344 p.
4. Hattie, J. (2013). Calibration and confidence. *Learning and Instruction, 24*, 62–66.
5. Händel, M., de Bruin, A., Dresel, M. (2020). Individual differences in local and global metacognitive judgments. *Metacognition and Learning, 15,* 51–75.
6. Koriat, A. (1997). Monitoring one's own knowledge during study: A cue-utilization approach to judgments of learning. *Journal of Experimental Psychology: General, 126*(4), 349–370.
7. Nietfeld, J. L., Cao, L., & Osborne, J. W. (2005). Metacognitive monitoring accuracy and student performance in the postsecondary classroom. *The Journal of Experimental Education, 74*(1), 7–28.
8. Ranalli, J. (2018). Inaccurate metacognitive monitoring and its effects on metacognitive control and task outcomes in self-regulated L2 learning. *The Electronic Journal for English as a Second Language, 21*(4), 1–20.
9. Schraw, G. (1994). The effect of metacognitive knowledge on local and global monitoring. *Contemporary Educational Psychology, 19*(2), 143–154.
10. Schraw, G. (2009). A conceptual analysis of five measures of metacognitive monitoring. *Metacognition and Learning, 4,* 33–45.
11. Schraw, G., Kuch, F., Gutierrez, A. P., & Richmond, A. S. (2014). Exploring a three-level model of calibration accuracy. *Journal of Educational Psychology,* 1–11.
12. Serra, M. J. & Metcalfe, J. (2009). Effective implementation of metacognition. *In D. J. Hacker, J. Dunlosky, A. C. Graesser (Eds.), Handbook of Metacognition and Education. New York, NY: Routledge,* 278–298.
13. Thiede, K. W., Anderson, M. C. M., & Therriault, D. (2003). Accuracy of metacognitive monitoring affects learning of text. *Journal of Educational Psychology, 95*(1), 66–73.
14. Tobias, S. & Everson, H. T. (2009). The importance of knowing what you know: A knowledge monitoring framework for studying metacognition in education. *In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), The Educational Psychology Series. Handbook of Metacognition in Education*, 107–127.
15. Was, C. A. (2014). Discrimination in measures of knowledge monitoring accuracy. *Advances in Cognitive Psychology, 10*(3), 104–112.

Стаття надійшла до редакції 18.01.2021.
The article was received 18 January 2021.

УДК 159.953.5-057.87
DOI https://doi.org/10.32999/ksu2312-3206/2021-1-9

ПСИХОЛОГІЧНІ ДЕТЕРМІНАНТИ УСПІШНОСТІ ПІД ЧАС НАВЧАННЯ УЧНІВ ЗІ СХИЛЬНІСТЮ ДО ДЕПРЕСІЇ

Візнюк Інесса Миколаївна,
доктор психологічних наук,
доцент кафедри психології та соціальної роботи
Вінницький державний педагогічний університет імені Михайла Коцюбинського
innavisnjuk@gmail.com
https://orcid.org/0000-0001-6538-7742

Метою нашого дослідження було виявити психологічні детермінанти успішності під час навчання учнів зі схильністю до депресії. Для того щоб отримати результати, ми використовували такі **методики,** як опитувальник А. Бека, який спрямований на визначення рівня схильності до депресії, методика діагностики особистості на мотивацію до успіху Т. Елерса, методика для визначення типу акцентуації рис характеру та темпераменту К. Леонгарда та розрахунок визначення середнього балу річних оцінок для визначення шкільної успішності підлітків. За **результатами** статті, використовуючи програму SPSS, було встановлено, що не існує взаємозв'язку між рівнем схильності до депресії та типами акцентуації характеру, але існує взаємозв'язок між самими типами акцентуації. Також з'ясовано відсутність зв'язку між рівнем схильності до депресії та шкільною успішністю, але при цьому існує зв'язок між рівнем мотивації до успіху та шкільною успішністю.

Підліткова депресія може бути як наслідком, так і причиною шкільної неуспішності учнів, адже підлітковий вік є досить складним періодом у житті людини. В результаті цього наявність депресивних ознак може накладати відбиток у системі шкільного навчання учнів, на їх успішність, на взаємини