

Anti-Reflection as a Determinant of Managerial Effectiveness Parameters

Aleksandr A. Karpov^{*}, Anastasiya A. Volchenkova,
Sergei O. Prisyazhnyuk

P. G. Demidov Yaroslavl State University, Yaroslavl, Russian Federation

*Corresponding author: karpov.sander2016@yandex.ru

Abstract

Introduction. Research into the key determinants of managerial effectiveness is currently highly relevant. Particularly important is the role of reflection regulation and anti-reflection means in managerial activity. Their exploration is objectively necessary for the convergence of research in two important psychological fields – managerial psychology and reflection psychology. The study identified and interpreted the fundamental patterns of the determinative impact of anti-reflection as the structure of its partial components—metacognitive processes and qualities—on managerial effectiveness. The most important of these is the optimum-type relationship between the individual measure of anti-reflection and the most important of these parameters—effectiveness. **Methods.** The participants in the study (n = 310) were lower-, middle-, and top-level managers of government and commercial organizations and enterprises in Moscow, Yaroslavl, and Rybinsk. The study used assessment instruments developed by the authors, including the Questionnaire to Measure the Level of Anti-Reflection Means, the Questionnaire to Measure the Differentiated Expert Assessment of Basic Managerial Functions, the Comprehensive Questionnaire of Individual Metacognitive Potential (CQIMP), and a number of instruments developed in metacognitivism. **Results.** An inverted U-shaped (optimum-type) relationship exists between the main parameter of managerial activity—effectiveness—and the individual measure of the development of anti-reflection means, as well as their structural organization. Unlike a similar pattern associated with reflection research, the established relationship exhibits a leftward shift, which is due to the specific characteristics of anti-reflection, as well as its phenomenological content and functional focus. **Discussion.** The results are interpreted from the perspective of the fundamental tenets of modern managerial psychology, reflection psychology, and metacognitivism.

The conclusion is that the established patterns are based on functions specific to anti-reflection, which essence is in regulating voluntary control over the implementation of activities in general and its minimization in particular.

Keywords

managerial activity, anti-reflection, metacognitive parameters, metacognitive potential, reflection, inhibition, structural organization, autofunction, effectiveness

Funding

This study was supported by the Russian Science Foundation grant no. 24-78-10047, <https://rscf.ru/project/24-78-10047/>

For citation

Karpov, A. A., Volchenkova, A. A., & Prisyazhnyuk, S. O. (2025). Anti-reflection as a determinant of managerial effectiveness parameters. *Russian Psychological Journal*, 22(2), 151–169. <https://doi.org/10.21702/z05e9s63>

Introduction

One of the key issues in managerial psychology is the nature and methods of expressing the basic parameters of managerial effectiveness, as well as the fundamental subjective determinants that exert a decisive influence on them. This issue is known to be one of the most important and traditional in managerial psychology and organizational psychology. Despite a considerable amount of data presented in the literature, it nevertheless remains insufficiently studied. Thus, the nature of the influence of the fundamental determinants—widely represented in general and cognitive psychology—on managerial effectiveness remains unclear. This primarily concerns procedural and strategic processes, as well as specific metacognitive processes and individual traits that are determinants of activity. These processes constitute the subject of research in one of the most important areas of cognitive psychology—modern metacognitivism (and, more broadly, metacognitive psychology). The main objective of the research carried out in its mainstream is to explicate the content and specificity of its *subject*, as well as to define its boundaries—the formulation of conceptual ideas aimed at revealing the subject area of metacognitivism (A. Nelson, A. Brown, J. Flavell, R. Kluwe, J. Metcalfe, R. Paris, E. Madigan, E. Tulving, B. L. Schwartz, A. Koriat et al.), the main models of metacognition (Anderson, 2002; Brown, 1987; Flavell & Miller, 1993; Dunlosky & Nelson, 1992; Dunlosky, Serra & Baker, 2007; Kluwe, 1982; Nelson, 1996), explication and description of metacognitive strategies and

skills (Metcalf, 2008; Metcalfe & Eich, 2019; Tulving, 1985; Finn & Metcalfe, 2014), and the study of specific issues of metacognitivism (Schwartz, 2006; Paris, 1988; Touroutoglu & Efklides, 2010; Velychkovsky, 2006).

Furthermore, we should emphasize that our previous series of works formulated one possible approach to developing the fundamental problems of metacognitivism—a *structural-phenomenological* one. This approach has been applied to a wide range of professional and educational activity, and, in particular, to managerial activity. Its essence is as follows (A.A. Karpov, 2018): The key parameters of the individual's metacognitive sphere appear not only in their original status—as *phenomena*—but also in another, equally important status—secondary one. This is because they can be recognized by the subject of the activity and subsequently used as *means* of organizing activity and behavior, that is, in their operational status. In other words, emerging and developing in activity, these effects and phenomena are captured by the subject and can then be used as *means to optimize* this activity (A.A. Karpov, 2019). Recognizing and recording, as well as generalizing these phenomena, subsequently leads to the enrichment of the operational tools for regulating activity.

At the same time, our research shows that the degree of voluntary, reflection-related control over basic activity-related problem solving does not always need to be maximal. Moreover, the subject of managerial activity (the manager), as a rule, has already empirically—from his/her own experience—often notes the fact that excessively high conscious control can even be undesirable and even negative for the activity. Therefore, they begin to use this empirically discovered result as an operational tool for implementing the activity itself, consciously using various techniques and means that *minimize* the degree of reflection control over the activity. For these purposes, specific means are developed, aimed at *inhibiting* or even blocking conscious control (A.A. Karpov, 2018). At present, no generally accepted concept has been developed to designate them, so there is a terminological difficulty associated with its formulation. It should be taken into account that some functionally close phenomena have already been partially reported in previous studies. These are, for example, the concept of areflexia or the “dark side” of reflection (Kholodnaya, 2022); the concepts of quasi-reflexia and “bad” reflection (Leontiev et al., 2009; Leontiev, 2014); the concept of “metacognitive blockade” (A.V. Karpov, Skitiaeva, 2005); the concept of “moratorium of reflection” (Nebrodovskaya-Mazur, 2020); the concept of counter-reflection (Leontiev, 2014); the concept of the “metacognitive loop” (Anderson et al., 2006); the concept of “overconfidence” (Metcalf, 2014; Butterfield, Metcalfe, 2001); reflection perfectionism and hyperreflection (A. A. Karpov, A. V. Karpov, 2015); the hypercorrection effect (Dodson, Bawa & Krueger, 2007).

In our opinion, given the essential nature of this phenomenon—its functional focus on minimizing reflection control and therefore acting as its *opposite*—it is more appropriate to use the concept of “*anti-reflection*”. We are fully aware, however, that this term may not be the best conceptual tool and may be subject to further refinement.

In this regard, we should emphasize that modern managerial psychology has traditionally focused on the reflection aspects of managerial activity, and has interpreted reflection itself as one of the professionally important qualities (PIQ) of a manager. Reflection is generally viewed as a predominantly positive quality, and its high or above-average level, again according to a priori assumptions, is considered an important factor in ensuring high effectiveness indicators. However, to date, provisions have been formulated that indicate the existence of a significantly different, more general, pattern. It consists in the fact that the effectiveness of the implementation of the overwhelming majority of activity-related tasks and management functions is maximal at some average, that is, optimal level of reflection development (and not at its minimum or maximum level) (A.V. Karpov, V.V. Ponomareva, 2002; Chemyakina et al., 2018). The subject of the activity, recognizing this feature, uses it as a means of optimizing his/her activity and, as noted above, to do this, he/she uses specific means that minimize the degree of reflection control over the activity and its specific functions. These data, in fact, allow us to differentiate a very specific – opposite – mode of reflection. It can not only enhance–facilitate but also minimize–inhibit itself. We should note that such inhibition is achieved through means and mechanisms that are also emphatically reflection-related. As a result, a system of anti-reflection means emerges and develops within managerial activity, identified in our previous works as an *inhibitory subsystem* (A.A. Karpov, 2019).

All these provisions, on the one hand, indicate the need to establish patterns associated with “anti-reflection” regulation of managerial activity and to deepen research, primarily of a descriptive and ascertainable nature. On the other hand, it is necessary to explicate the mechanisms underlying possible relationships between managerial effectiveness and the overall level of the development of anti-reflection means. A similar task involves determining the relationship between the degree of structural organization of metacognitive parameters, which represent partial components of anti-reflection and effectiveness. To this end, in addition to establishing empirical data, it is necessary to conduct a comparative analysis of these data with a number of other relationships already established in managerial psychology.

Methods

Research and Measurement Procedure

Achieving the main objectives of the study requires obtaining three main empirical data sets. First, these are data on the individual measure of the subjects’ anti-reflection means. Second, these are data on the individual measure of parameters of their metacognitive sphere. Third, these are data on assessing the effectiveness of the implementation of key management functions.

For these purposes, the following assessment instruments were used:

To determine the individual measure of anti-reflection, we used our own technique for diagnosing Metacognitive Inhibition (MI) (A.A. Karpov, 2019).

To diagnose the main metacognitive determinants, we used widely used and highly reliable assessment instruments, including:

- Metacognitive Awareness Inventory (MAI) (Schraw & Dennison, 1994; Yzerbyt et al., 2002), modified by A.V. Karpov (A.V. Karpov, Skityaeva, 2005))
- Individual Measure of the Development of Metathinking (MT) as basic and process-related (according to our technique) (A.A. Karpov, 2019)
- D. Everson Instrument for Diagnosing the Level of Metapanning Development – MPlan (in A.A. Karpov, A.V. Karpov, 2015)
- Level of Development of Meta-Emotional Control (MEC) according to the scale of the Comprehensive Questionnaire of Individual Metacognitive Potential (A.A. Karpov, 2018)
- Metacognitive Behavior (MB) Self-Assessment Scale provided by LaCosta (in A.V. Karpov, 2016)
- Measure and Specificity of Metacognitive Monitoring of Knowledge (MK) according to the Metacognitive Awareness Inventory (MAI) (in A.V. Karpov, Skitiaeva, 2005), defined as the sum of scores on two scales: Metacognitive Knowledge and Metacognitive Regulation;
- Individual Measure of the Development of Metamemory as another key metacognitive process (according to the instrument developed in (Karpov, Skitiaeva, 2005)).

To determine effectiveness, we used the Questionnaire to Measure the Differentiated Expert Assessment of Basic Managerial Functions (A.A. Karpov, 2019).

We should especially emphasize that the selection of assessment instruments was carried out in such a way that, to the extent possible, to present a sufficiently broad range of the main metacognitive qualities that have been studied to date in managerial activity—not only cognitive, but also regulatory and knowledge-based.

Study Participants

The participants in the study (n = 310; 220 males, 90 females) were lower-, middle-, and top-level managers of government and commercial organizations and enterprises in Moscow, Yaroslavl, and Rybinsk, aged 29 to 59 years. The selection of subjects was conducted strictly in accordance with the traditional principles of managerial psychology, according to which the main characteristics of managerial activity remain unchanged regardless of managerial levels of managers, despite obvious formal differences in status.

Data Analysis

The study procedure included its implementation at two levels and, accordingly, stages—*analytical* and *structural*. The first of these was aimed at establishing differences between the studied groups of managerial subjects with using the Kruskal-Wallis H-test. However, the analytical stage allows obtaining only individual, partial data and should be further supplemented by more specific assessment instruments with greater resolving power. Therefore, the second stage of the study was carried out – the structural one, which involves the implementation of the methodology of *structural-psychological* analysis. It, as is known, includes the polar groups method, which consists of differentiating the sample into contrasting groups, as well as subsequent processing and comparative analysis of the data in them according to a certain criterion. In our case, this was the individual measure of anti-reflection. Then, based on the data from the assessment instruments presented above, intercorrelation matrices were calculated. Each of them was determined on the basis of the identified groups of subjects. As a result, each of the three groups (with low, moderate, and high levels of anti-reflection) has its own intercorrelation matrix. Based on the results of constructing the matrices we calculated the indices of *coherence* (ICS), *divergence* (IDS) and general organization (IGO) of the structures of the main parameters of individual metacognitive sphere. The ICS was defined as a function of the number of positive significant correlations in the structure and the degree of their significance; the IDS was defined as a function of the number and significance of negative correlations in the structure; and the IOS was defined as a function of the ratio of the total number and significance of positive and negative correlations, that is, as the difference between the scores of the ICS and the IDS (Karpov, Skityaeva, 2005; A. A. Karpov, 2018).

Results

Table 1 presents the individual measures of the diagnosed basic metacognitive parameters, as well as their overall score, in the “polar” groups of subjects – those with the relatively lowest and highest levels of the development of anti-reflection means.

The analysis of the presented results enables us to state the following: First, in general, the individual measure of the development of almost all metacognitive parameters is higher in the group of individuals with moderate anti-reflection compared to the group with low anti-reflection. However (and this is second), these differences are not significant for all parameters, but only for 4 at a $p < 0.10$ level. Third, and most important, group differences also exist for the overall metacognitive potential score; they are also significant only at a $p < 0.10$ level.

Table 1
Means and Standard Deviations

Variable	Overall sample (N = 310)	Comparison of Groups by Groups with Different Levels of Anti-Reflection		
		Low Anti-Reflection (n = 103)	Moderate Anti-Reflection (n = 115)	p
MAI	23.07 (5.78)	15.91 (5.80)	28.00 (5.95)	.000
MT	20.01 (5.66)	17.09 (4.62)	23.05 (5.85)	.328
MP	34.25 (4.99)	33.41 (4.64)	35.08 (4.22)	.461
MEC	44.18 (9.88)	43.36 (7.57)	44.02 (5.74)	.560
MB	12.29 (2.40)	10.14 (2.63)	19.47 (2.14)	.000
MM	36.59 (3.35)	30.39 (3.10)	35.07 (4.10)	.337
KC	39.43 (5.14)	35.77 (5.95)	45.09 (5.02)	.000
KMM	0.33 (0.11)	0.21 (0.08)	0.41 (0.15)	.331
MP	63.09 (6.62)	56.68 (7.34)	69.37 (7.05)	.000

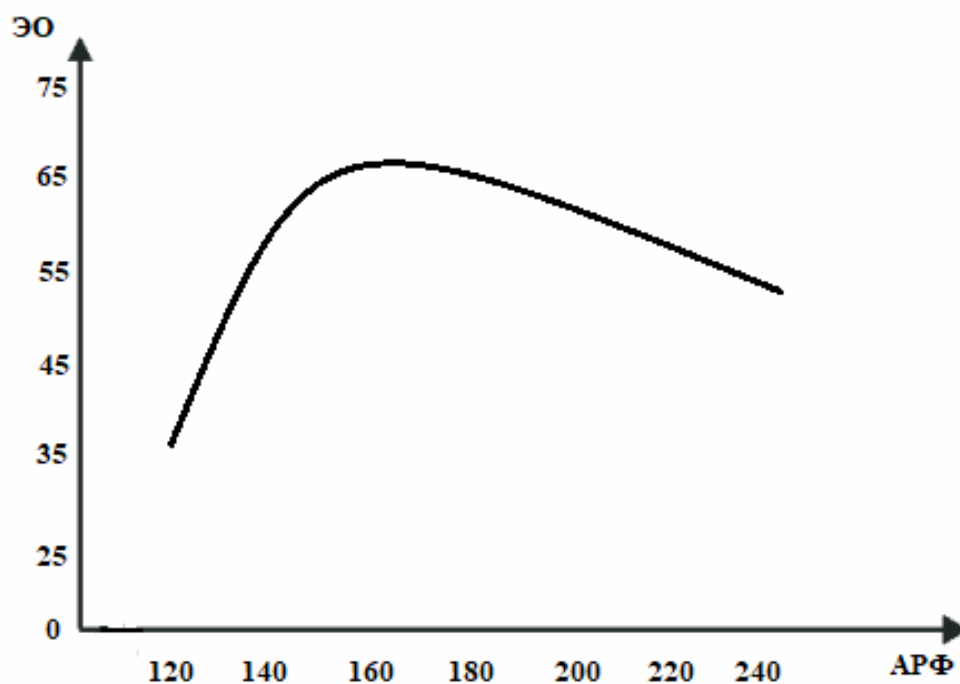
Notes: MT – metathinking, MM – metamemory, MEC – meta-emotional control, MP – metaplanning, MB – metacognitive behavior, KC – knowledge about cognition according to the corresponding scale from the Metacognitive Awareness Inventory (MAI) (G. Shrow, R. Dennison), KMM – knowledge about metacognitive monitoring (according to KMAI by Z. Tobias), MCP – metacognitive potential (unlike all other parameters, it is presented not in scores from the corresponding assessment instruments, but as a superposition of sten scores for the 8 parameters of the CQIMP); p – asymptotic two-sided significance of differences according to the Mann-Whitney U test; scores of $p < 0.10$ are highlighted in bold.

LABOR PSYCHOLOGY

Implementation of the differentiated expert assessment for basic management functions allowed us to obtain indicators of the overall effectiveness of managerial activity for three groups of subjects, differentiated according to the criterion of the level of anti-reflection. As a result, it was possible to determine the relationship between managerial effectiveness and the individual level of anti-reflection. Figure 1 shows this relationship.

Figure 1

Relationship between managerial effectiveness and the level of anti-reflection (schematically)

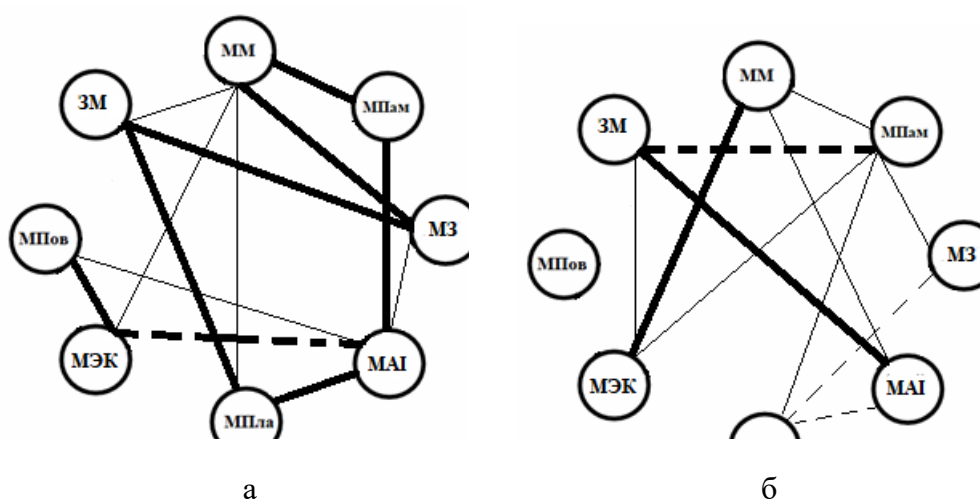


Notes: ARM – individual measure of the development of anti-reflection means (in scores of the assessment instrument); EA – expert assessment of effectiveness (using a 75-point scale)

Using the Kruskal-Wallis H-test, we found that, at the analytical level, the three groups, differentiated according to the level of development of anti-reflection means, exhibited significant differences in the degree of managerial effectiveness ($p < 0.10$). The obtained data were then analyzed using multivariate correlation analysis, and intercorrelation matrices of the studied metacognitive parameters were determined for each group, which were used to construct their structurograms. Figure 2 shows structurograms for the groups of subjects with low and moderate levels of anti-reflection.

Figure 2

Structurograms of metacognitive parameters in the subgroups of low-level anti-reflection subjects (a) and moderate-level anti-reflection ones (b)



Notes: The abbreviations in the structurogram correspond to the parameter designations given in the descriptions of the assessment instruments used; the bold line indicates relationships at $p < 0.01$ (they are assigned 3 points); the thin line indicates relationships at $p < 0.05$ (they are assigned 2 points); the dotted line indicates negative relationships. The relationships obtained for the entire 'weight' structure are summed, yielding the scores of the indicated indices.

Based on the resulting matrices and the corresponding structurograms, the scores of the structural indices of the metacognitive determinants of activity were determined for all three groups of subjects. Table 2 shows the results.

Table 2

Scores of structural indices of metacognitive parameters

	Low-Level Anti-Reflection Group	Moderate-Level Anti-Reflection Group	High-Level Anti-Reflection Group
Coherence Index (CIS)	12	22	14
Divergence Index (DIS)	5	3	4

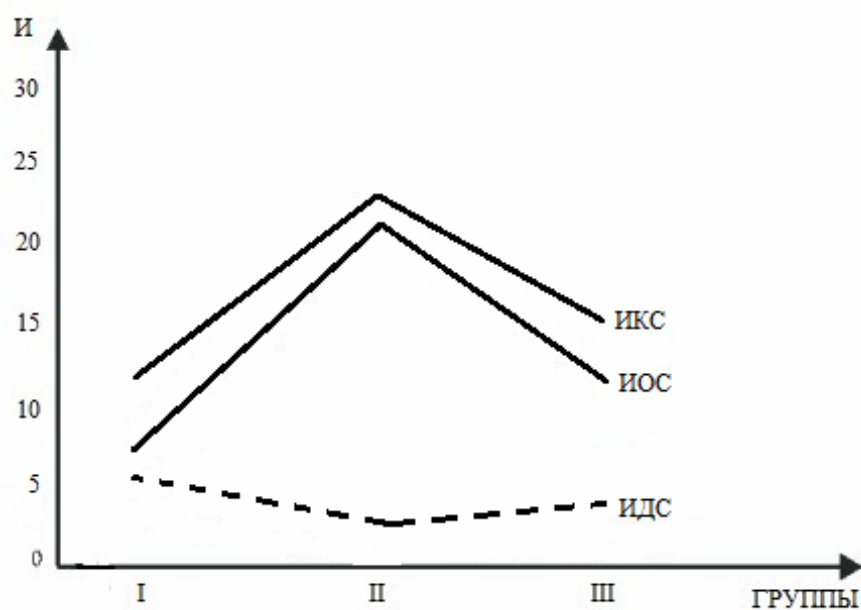
LABOR PSYCHOLOGY

	Low-Level Anti-Reflection Group	Moderate-Level Anti-Reflection Group	High-Level Anti-Reflection Group
Organization Index (OIS)	7	19	10

These data can also be presented graphically, enabling us to explicate the dependence of these indices on the individual level of anti-reflection (Figure 3).

Figure 3

Correlation between structural indices of metacognitive parameters and the level of anti-reflection



Notes: the abscissa axis shows groups of subjects differing in the level of anti-reflection, in ascending order; the ordinate axis shows the quantitative scores of the structural indices (I).

Discussion

All the results presented above enabled us to establish the following key features and patterns.

First, we should note that the relationship between managerial effectiveness and the level of anti-reflection is not a direct and unidirectional one. The most effective managers were those whose overall level of anti-reflection was at a moderate (albeit well-developed) level. Managers with low levels of anti-reflection appear to be insufficiently capable of performing basic management functions, thus being characterized as professionally ineffective. However, managers with the most pronounced anti-reflection traits should also be considered relatively less effective. In this regard, it becomes clear that the system of anti-reflection determinants has a direct, immediate, and highly significant impact on managerial effectiveness. This impact is most positive when the level of anti-reflection is characterized by certain average scores. In other words, this is nonlinear inverted *U-shaped relationship*. It is an optimum-type relationship.

At the same time, the obtained result should also be considered in the context of our previous research (Karpov, 2019). They demonstrate that reflection, being one of the most complex processes, and reflection, interpreted as a professionally important quality (PIQ) of a manager, are associated with the parameters of managerial activity by a nonlinear, *optimum-type* relationship. According to this relationship, activity parameters are high-scoring not at maximum, nor at minimum, levels of development, but at certain intermediate, optimal levels. At the same time, we note that, despite the fact that both results (established in relation to the levels of anti-reflection, on the one hand, and reflection, on the other) represent the relationship of the same type, they nevertheless possess very specific distinguishing features.

Thus, the relationship between managerial effectiveness and an individual measure of reflection is very similar to the traditional bell-shaped curve, where average scores are located approximately in the middle of the coordinate plane. Therefore, this relationship can indeed be a classic optimum-type relationship. However, the level of anti-reflection is related to the parameters of managerial effectiveness via a somewhat different relationship. As can be seen from the graph (Figure 1), it exhibits the so-called "*leftward shift*". This result is explained by the specific characteristics of anti-reflection and the inhibitory subsystem as a whole. These characteristics are such that a moderate (or rather, slightly below average) level of their development proves most beneficial in terms of ensuring effectiveness.

Secondly, an analysis of the obtained indices of the structural organization of the main parameters of the metacognitive sphere of personality in the three study groups, differentiated according to the criterion of the level of anti-reflection, enables us to conclude the following: First, the dynamics of the coherence index (CIS) are remarkable. The group of subjects with the lowest scores of anti-reflection means is characterized, again, by the lowest CIS and the score of the generalized structural index, calculated as a superposition of the CIS and the divergence index (DIS) – the index of general organization (IGO). Approximately the same results are observed for the group of managers with the highest level of anti-reflection. Despite this similarity, they are still expressed to a lesser

degree, which ultimately results in a leftward shift shown in the graph (Figure 1). In other words, managerial effectiveness in the context of the problem under consideration is decisively characterized not by the lowest, nor by the highest, degree of the organization of metacognitive parameters, but by certain average scores – or, more precisely, above-average scores. This, in many ways, underlies the fundamental difference between the dependence of managerial effectiveness on “simple” reflection, on the one hand, and on “anti-reflection”, on the other. The first one, as noted above, is characterized by the classic optimum-type dependence, although the configuration of the two dependences and, accordingly, their general meaning are quite similar. This result finds its consistent explanation in the fundamental mechanisms of reflection and anti-reflection which, as is well known, are not simply similar but essentially identical. It is appropriate to consider anti-reflection means not in a negative way—not as the “absence” of reflection or properties antagonistic to it—but, on the contrary, as the same emphatically reflection-related means. However, they have the opposite functional focus—on suppressing and inhibiting reflection itself—and are apparently more complex in structure.

Thirdly, in order to explain the observed patterns, another obtained result should be considered. The finding is that the degree and specificity of the *structural* organization of the metacognitive parameters under study is related to the level of anti-reflection. Moreover, this level appears to be a significant determinant of this structural organization itself, which is consistent with similar relationships we previously obtained regarding the relationship between the degree of structural organization of intelligence and its overall level, as well as the relationship between the structural organization of creativity and its level of development (A.A. Karpov, 2018).

However, the converse is also apparently true. The structural organization of the metacognitive determinants of activity, and particularly its degree, is a determinant of the level of development of anti-reflection and, indirectly, the specificity of its influence on effectiveness. The latter is greatest at the intermediate level of anti-reflection because it is at this level that the degree of structural organization of the metacognitive parameters themselves is greatest. Consequently, the resulting systemic effects, leading to the generation of additional functional capabilities, are most obvious and effective here. In other words, the maximum organizational effects are associated not with the maximum (but certainly not with the minimum) scores of the level of anti-reflection, but with certain average or, in other words, optimal scores. Therefore, the identified association between the individual level of reflection and the degree of structural organization and, consequently, with the degree of representation of synergetic effects should be considered as an interpretative tool for explaining the fundamental features of its organization.

Fourth, in all three structures studied, the divergence index (DIS) scores were minimal. We emphasize that this situation is quite common in studies examining various metacognitive parameters; it is apparently entirely explainable and refers to the very nature of metacognitive determinants as special constructive means of enhancing an

individual's mental resources. Such a facilitating role, in our opinion, cannot be realized principally under conditions where the interrelations between individual metacognitive parameters are, for the most part, negative and, consequently, produce disintegrative tendencies and compensatory relationships within the structures. This, we repeat, would contradict the very essence and content of metacognitive determinants. Therefore, the extremely low DIS values and, against this background, the increase in synergistic effects, as well as the general consolidation of metacognitive potential, which, in turn, is expressed in objectively high scores of the general organization index (IGO), seem entirely natural.

Fifth, we should note that optimum-type dependencies, while widely represented in psychological research, can nevertheless undergo certain modifications. For example, in addition to the traditional version of these dependencies, another one has been identified that is also nonlinear—an inverted U-shaped one, but exhibits a *rightward shift*. This applies, in particular, to the already mentioned dependence of the level of development of psychometric intelligence on the degree of integration of the structure of metacognitive processes and personality traits. In relation to intellectual abilities, there is a significant decrease in the degree of organization of metacognitive parameters, and its highest values occur not at low (which is quite natural), but also not at very high scores of the level of intelligence. They have the highest scores at certain, albeit high, but still not polar scores (A.A. Karpov, A.V. Karpov, 2015; A.A. Karpov, 2018). Along with this, in relation to the relationship between effectiveness and the level of reflection, there is a classic version of the optimum-type dependence, in which the maximum scores of this effectiveness are associated with the average scores of reflection (A.V. Karpov, Ponomareva, 2000).

Thus, we can conclude that the optimum-type relationship, which is crucial for mental and activity organization, can be differentiated into at least three main varieties. Each of these is presented in the context of research in various aspects (reflection, anti-reflection, and psychometric intelligence) and was established primarily during the study of managerial activity.

Sixth, establishing and explaining the entire complex of identified effects in general and the dynamics of structural organization indices in particular presupposes another aspect of the general procedure of structural-psychological analysis. This involves implementing the χ^2 test, which, as is well known, allows for comparison of the matrices under study and their corresponding structures for their homogeneity-heterogeneity. In our case, implementing this method yielded the following results: The structure of metacognitive parameters of subjects belonging to three groups differentiated according to the criterion of the level of anti-reflection, when compared with each other, turned out to be fundamentally *homogeneous*—only *quantitative* differences were observed between them. This result can be considered entirely predictable, as it reflects the fundamental commonality of the structural organization of metacognitive potential, regardless of the degree of manifestation of anti-reflection means.

Therefore, despite the highly significant structural effects manifested in the rather significant differences in the structurograms found, they still cannot be overemphasized. The fact is that these differences themselves exist and manifest themselves against the backdrop of even more general and, essentially, fundamental patterns of the combination of two types (and levels) of determination—analytical and structural. And it is precisely in this regard that another fact obtained during the processing of the results provides important confirmation of this commonality. The result is that a comparison of the intercorrelation matrices of metacognitive parameters for their homogeneity/heterogeneity in the two groups using the χ^2 test revealed statistically significant *homogeneity*.

The entire set of data presented above creates the necessary and, in many ways, sufficient prerequisites for solving a number of purely applied problems. Their purpose lies in the development and implementation of special procedures and training programs aimed at developing operational anti-reflection means in professional activity in general and in managerial activity in particular. These are designed to minimize the use of reflection regulation means and, conversely, maximize the role of inhibitory means in supporting it. Moreover, it is very significant in this regard that the operational means identified by us (in A.A. Karpov, 2019), which are of a supra-normative nature and are referred to as activity heuristics, play a very important functional role in their formation and subsequent implementation. In general, their content is not limited to the goal of minimizing voluntary control over activity; however, specific heuristics of this nature also develop in relation to them. They play not just an important but, in many ways, a decisive role in the organization of activity—especially professional activity, and, above all, those types characterized by the greatest complexity. These means are also designated by other terms—concepts of informal rules, professional methods, “techniques”, top skills, professional tricks, and so on. It is significant that they are often generated by the professionals themselves—those who carry out these activities. As a result, a kind of supra-normative operating fund of means is formed that allows for the optimization of its psychological support. As we demonstrated (in A.V. Karpov, A.A. Karpov, 2022), the main inhibitory heuristics include operational means designated by the concepts of cognitive blockade heuristics, reflection moratorium heuristics, metacognitive blockade heuristics, complexity reduction heuristics, schematization heuristics, voluntary (i.e., reflection) acceleration heuristics, effort reduction heuristics, fluency heuristics, and mental simplification heuristics. Based on these identifications, we developed specific procedures aimed at their explication and development in managerial activity, serving as means for its applied optimization.

Summarizing the above analysis, the following key *conclusions* can be formulated: *First*, research in two highly important fields—the psychology of reflection and metacognitivism, on the one hand, and managerial psychology, on the other—is characterized by increasing convergence and is gradually acquiring the necessary and

sufficient conditions for a consistent interdisciplinary synthesis. At the same time, one of the key features of such a gradual unification should be research aimed at exploring the place and role of anti-reflection means in managerial activity, as well as their identification as important determinants of their implementation.

Second, the validity of such a conceptualization objectively presupposes the implementation of empirical and experimental methods. This allows for the identification of new facts and, accordingly, the underlying patterns. Thus, it becomes possible to explicate a new generalized individual *quality*, designated by the concept of “anti-reflection”, and to identify it as an integrative entity formed through the consolidation of the entire set of parameters of the individual metacognitive sphere. This constitutes its similarity to reflection. Moreover, anti-reflection means in their orientation should be viewed as emphatically reflection-related in their mechanisms. They are necessary for the conscious reduction—inhibition—of high and above-moderate levels of reflection. Such regulatory mechanisms are fundamentally important for management activity in general, and for the implementation of each management function in particular.

Thirdly, the established relationship between managerial effectiveness and the individual level of the development of anti-reflection means is an inverted U-shaped curve and the optimum-type relationship known in psychological research. A similar relationship exists between managerial effectiveness and the degree of development of reflection. However, in the first case, a leftward shift is observed, while in the second, there is a centering effect. This can be explained by the specific characteristics of anti-reflection, as well as the influence of individual phenomenological aspects of the metacognitive sphere.

Fourth, it was established that only quantitative differences are observed between the studied structures of metacognitive parameters, differentiated by the criterion of the individual level of anti-reflection development, and the structures themselves are therefore characterized as homogeneous. This, along with the low divergence index (DIS) scores, indicates that the metacognitive parameters function in a tight synergistic unity, with a minimal role for disintegrative tendencies, in order to achieve a common result—strengthening the individual’s mental resources and improving the effectiveness of the “external criterion”—managerial effectiveness.

Highlights:

- Anti-reflection means have not only a significant but also a comprehensive impact on managerial effectiveness.
- The fundamental relationship between the main parameter of managerial activity—effectiveness—and the individual level of anti-reflection is an inverted U-shaped optimum-type relationship; it is based on a set of fundamentally specific characteristics of anti-reflection itself, as well as its phenomenological content.

- The fundamental relationship between managerial effectiveness and the degree of structural organization of the basic metacognitive processes and qualities underlying anti-reflection is a direct correlation between them.

References

- Anderson, J. (2002). *Cognitive psychology*. Piter. (in Russ.).
- Anderson, M. L., Oates, T., Chong, W., & Perlis, D. (2006). The metacognitive loop: Enhancing reinforcement learning with metacognitive monitoring and control for improved perturbation tolerance. *Journal of Experimental & Theoretical Artificial Intelligence*, 18(3), 387–411. <https://doi.org/10.1080/09528130600926066>
- Brown, A. L. (1987). Metacognition, executive control, self-regulation, and other more mysterious mechanisms. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65–116). Hillsdale, NJ: Lawrence Erlbaum Associates. <https://doi.org/10.12691/education-4-2-5>
- Butterfield, B., & Metcalfe, J. (2001). Errors committed with high confidence are hypercorrected. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 27, 1491–1494. <https://doi.org/10.1037//0278-7393.27.6.1491>
- Chemyakina, A. V., Perevozkina, Yu. M., Karpov, A. V., & Karpov, A. A. (2018). Structural patterns of reflection – determination of managerial activity. *Novosibirsk State Pedagogical University Bulletin*, 8(5), 209–228. (in Russ.).
- Dodson, C. S., Bawa, S., & Krueger, L. E. (2007). Aging, metamemory and high confidence errors: A misrecollection account. *Psychology and Aging*, 22, 122–133. <https://doi.org/10.1037/0882-7974.22.1.122>
- Dunlosky, J., & Nelson, T. (1992). Importance of the kind of cue for judgment of learning (JOL) and the delayed-JOL effect. *Memory & Cognition*, 12, 355–360.
- Dunlosky, J., Serra, M. J., & Baker, J. (2007). Metamemory. In F. T. Durso, R. S. Nickerson, S. T. Dumas, S. Lewandowsky, & T. J. Perfect (Eds.), *Handbook of applied cognition* (2nd ed., pp. 137–161). Chichester, UK: John Wiley & Sons.
- Finn, B., & Metcalfe, J. (2014). Overconfidence in children's multi-trial judgments of learning. *Learning and Instruction*, 32, 1–9.
- Flavell, J. H., Miller, P. H., & Miller, S. A. (1993). *Cognitive development* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall. <https://archive.org/details/cognitivedevelop00flav>
- Karpov, A. A. (2019). *New methods for studying metacognitive regulation of managerial activity*. MPSU. (in Russ.).
- Karpov, A. A. (2018). *The structure of metacognitive regulation of managerial activity*. Yaroslavl State University. (in Russ.).
- Karpov, A. A., & Karpov, A. V. (2015). *Introduction to metacognitive psychology*. Moscow Psychological and Social University. (in Russ.).

- Karpov, A. V., & Ponomareva, V. V. (2000). *Psychology of reflection management mechanisms*. Institute of Psychology, Russian Academy of Sciences. (in Russ.).
- Karpov, A.V., & Skityaeva, I.M. (2005). *Psychology of metacognitive processes of personality*. Institute of Psychology, Russian Academy of Sciences. (in Russ.).
- Karpov, A.V., & Karpov, A.A. (2022). *The structure of metacognitive regulation of information activity*. Filigran. (in Russ.).
- Kholodnaya, M. A. (2022). Light and dark sides of reflection and areflection: Splitting effect. *Psychological Journal*, 4, 15–26. <https://doi.org/10.31857/S020595920021475-8> (in Russ.).
- Koriat, A. (2000). Conscious and unconscious metacognition: A rejoinder. *Consciousness and Cognition*, 9, 193.
- Leontiev, D.A., Lapteva, E.M., Osin, E.N., & Salikhova, A.Zh. (2009). Development of a methodology for differential diagnostics of reflection. In V.E. Lepskiy (Ed.), *Reflection processes and management: Proc. of the VII international symposium* (pp. 145–150). (in Russ.).
- Leontiev, D.A., & Osin, E.N. (2014). "Good" and "bad" reflection: From an explanatory model to differential diagnostics. *Psychology. Journal of the Higher School of Economics*, 11(4), 110–135. (in Russ.).
- Nebrodovskaya-Mazur, E. Yu. (2020). The impact of reflection on the professional identity of young prosecutorial workers. *Yaroslavl Psychological School: History, Modernity, Prospects*, 175–179. (in Russ.).
- Metcalf, J. (2008). Evolution of metacognition. In J. Dunlosky & R. Bjork (Eds.), *Handbook of metamemory and memory* (pp. 29–46). Psychology Press.
- Metcalf, J., & Eich, T. S. (2019). Memory and truth: Correcting errors with true feedback versus overwriting correct answers with errors. *Cognitive Research: Principles and Implications*, 4. <https://doi.org/10.1186/s41235-019-0153-8>
- Nelson, T. O. (1996). Consciousness and metacognition. *American Psychologist*, 51(2), 102–116. <https://doi.org/10.1037/0003-066X.51.2.102>
- Paris, S. G. (1985). *Reading strategies, metacognition and motivation*. New York.
- Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, 19(4), 460–475. <https://doi.org/10.1006/ceps.1994.1033>
- Schwartz, B. L. (2006). Tip-of-the-tongue states as metacognition. *Metacognition and Learning*, 1, 149–158.
- Touroutoglou, A., & Efklides, A. (2010). Cognitive interruption as an object of metacognitive monitoring: Feeling of difficulty and surprise. In *Trends and prospects in metacognition research* (pp. 171–208). Springer US.
- Tulving, E. (1985). Memory and consciousness. *Canadian Psychology / Psychologie canadienne*, 26(1), 1–12. <https://doi.org/10.1037/h0080017>
- Velichkovsky, B. M. (2006). *Cognitive science. Foundations of the psychology of knowledge: In 2 volumes. Vol. 1*. Academiya. (in Russ.).
- Yzerbyt, V. Y. (Ed.). (2002). *Metacognition: Cognitive and social dimensions*. SAGE Publications.

Received: November 01, 2024

Revision received: December 12, 2024

Accepted: April 21, 2025

Author Contribution

Aleksandr Anatol'evich Karpov provided academic guidance for the study, based on the application of metacognitive methodology, contributed to the development of the reflection issues, and theoretical generalization of research findings.

Anastasiya Aleksandrovna Volchenkova developed the concept of the study using the methodology of structural analysis, analyzed data, and interpreted the results.

Sergei Olegovich Prisyazhnyuk contributed to the design of the empirical study, used the assessment instruments for reflection, collected the data, and interpreted the results.

Author Details

Aleksandr Anatol'evich Karpov – Dr. Sci. (Psychology), Professor, Department of Labor Psychology and Organizational Psychology, P. G. Demidov Yaroslavl State University, Yaroslavl, Russian Federation; ResearcherID: N-7550-2016, SPIN: 8353-5150; ORCID ID: <https://orcid.org/0000-0002-6432-8246>; e-mail: karpov.sander2016@yandex.ru

Anastasiya Aleksandrovna Volchenkova – Cand. Sci. (Psychology), Associate Professor, Department of Labor Psychology and Organizational Psychology, P. G. Demidov Yaroslavl State University, Yaroslavl, Russian Federation; SPIN: 9416-4094; ORCID ID: <https://orcid.org/0000-0001-8691-7132>; e-mail: 24crocus95@gmail.com

Sergei Olegovich Prisyazhnyuk – postgraduate student, Department of Labor Psychology and Organizational Psychology, P. G. Demidov Yaroslavl State University, Yaroslavl, Russian Federation; SPIN: 4505-4110; ORCID ID: <https://orcid.org/0009-0003-1684-2253>; e-mail: sergei-op100698@yandex.ru

Conflict of Interest Information

The authors have no conflicts of interest to declare.