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Reflection in the structure of cognitive organization of the decision making procedure[1]

Reflexion and decision making are complicated and unique mental procedures, regularly that implies their correlation, existence of a system of their relations and interactions. However, this very correlation is insufficiently studied and disclosed, that in many respects authorizes the author's reference to their research. In the article, attention is focused on three main levels of research: effective level, procedural level, and level of possible mechanisms and subject determinant of reflexive regulation of decision-making processes.

Results obtained in the research of two processes correlation, testify to the presence of definite metaregularity, connecting reflection with the different aspects of organization of decision-making procedures.

Keywords: *reflection, decision-making, functional dependence, principles of procedural organization of decision-making, mechanisms of mental integration, and metaregularity.*

Any process, ontologically presented in the content of psychic and gnoseologically differentiated by it in this content at its perception, is deeply peculiar and even unique.

However, even against the background of this originality of each mental process, two processes - reflection and decision-making - are characterized by special and even exclusive originality.

The first one because of its uniqueness in literal and direct sense of the given concept, as it is inherent only in man, selecting him from a number of all the rest living creatures.

The second one - by virtue of its unexampled complexity and heterogeneity, synthetical character and organic "alloy" of all main categories of other mental processes (cognitive, emotional, motivational, and determined) in it, and thereby - its belonging to the special class of mental processes - integral processes.

However, uniqueness and limiting originality of each of these two processes by no means signify their isolation from each other; just the

[1] The research has been carried out with the financial support of RSSF; project # 03-06-00284a

opposite - the highest degree of complexity of both of them objectively implies their correlation, existence of the system of regular relations, and interactions. There are all the grounds to suppose that these connections and relation are not less peculiar than the mentioned processes, taken as a "separate entity".

In fact, the analysis demonstrates that connections and relations of reflection with decision-making (DM) procedure are, perhaps, the most specific and deep, than with all other psychological processes.

Reflection and decision-making in many respects are opposite processes, even antagonistic by their functional orientation [1,2,5,11,15]. However, by the their psychological nature, they are close and similar, and that is why, they are complimentary and relative.

So, reflection (as process, as condition, and as property) is especially indispensable in all those situations, in which organization of behaviour is connected with choice, uncertainty and necessity of its overcoming.

Only in these "points of discontinuities of behavioural continuum" the reflexive processes and mechanisms are so significant and "the reflexive pause" is so relevant.

Thus, the DM processes objectively imply the actualization of reflexive processes and at great extent consist of them. The phase of so-called "informational preparation" of solutions in the conventional schemes of this process description in many respects is identical to "internal scanning", searching, i.e. essentially the process of reflection.

However, the dialectic of their relations is such that they also have features of distinctions in kind and even contrasts.

According to the definition, decision-making is the procedure that implies a direct contact with the organization and realization of behaviour, activity. In this sense, it represents an effective and activity-oriented process. On the contrary, reflection, in its substance, implies and even demands a "delay", pause in the behavioural and activity continuum.

It is active, but not effective. It is understandable that such contrast is caused by functional specialization of the mentioned processes, which, owing to this specialization, are organically related to each other.

At the same time, unfortunately, it is necessary to state that till now the correlation of processes of reflection and decision-making is not enough disclosed and studied.

There are many reasons of the most various kinds and "scales" - from the purely "technical" up to "ideological" and paradigmatic. And it is possible to refer to the latter the following circumstance.

The problem of reflection, in its modern state, goes back to the

introspective tradition of psychological research. As for the problem of DM, it has strongly pronounced "behavioural" backgrounds, as well as genetic affinity with "the informational approach" in psychology. Apparently, the indicated paradigms are not only weakly compatible, but at the great extent opposite.

However, some time or other the logic of psychological research results in the necessity of reference to analysis of DM and reflection processes correlation, and demands the special researches on the given problem.

Being guided by the indicated circumstances, we shall summarize some basic outcomes of analysis of correlation of processes and mechanisms of the reflexive regulation with DM procedures.

Naturally, the obtained results do not conclude the whole problem, though they reveal some essential, in our opinion, regularities of this correlation. Examining them, we shall concentrate our attention on three main questions: at first, we will review materials, obtained at the *effective* level of research; then, the analyzed data, revealing the features of the very *procedural* level of the studied correlation; and after that, the major task will be moved to the different level - level of possible *mechanisms* and subjective *determinant* of the reflexive regulation of DM procedures.

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The main and most general problem, existing at the effective level of research on correlation of processes of reflection and DM, consists in establishing a *functional connection* and, probably, determinant relations between them (if there are any).

Therefore, the experimental research should be directed towards attempting to establish a functional connection between two variables - measure of reflexivity and effective parameters of DM procedures.

Measure of reflexivity serves as an "independent" and quality of implementation of DM procedures acts as "dependent" among these variables.

To diagnose the measure of reflexivity, we used a special psychometric technique, worked out by the author together with V.V. Ponomareva, which had been approved earlier in a number of researches [6] and showed itself as good one.

The techniques "Concern" and "Choice", also developed by us, were used as the experimental models for determining personal distinctions between qualitative parameters of DM procedures

By means of these techniques earlier we had carried out a big cycle of experimental researches on DM procedures [2,4,5,7], owing to what they should be regarded not only as quite adequate to the purposes of the given

research, but also as experimentally approved.

The detailed description of these techniques, as well as other similar to them experimental computer models, is given in [4,5,6]. 220 people of both sexes, aged 18 – 47 took part in these experiments.

Conducted experiments and data processing resulted in obtaining the main dependence between two investigated variables (see pic. 1.)

Analysis of the introduced data allows making the following conclusions.

First, there is no straight, unambiguous linear dependence between the studied variables. This connection has essentially more complicated nature, approximating in its general view to inverted U-shaped dependence.

We have already repeatedly detected the similar kind of dependence in the connection of reflexivity parameter and number of other subjective and active characteristics.

In particular, the similar dependence is found between the personal measure of reflexivity and efficiency of administrative activity [3,6]. In general, for such relations the presence of two areas of minimum values of the dependent variable (in our case – DM quality) is characteristic. They correspond, accordingly, with minimum and maximum value of the "independent" variable.

Simultaneously, a "point" (more precisely - an area) of "dependent" variable maximum, corresponding with some "intermediates" – average of independent variable, is typical for them. It shows the detected regularity affiliation with so-called dependents of "optimum nature".

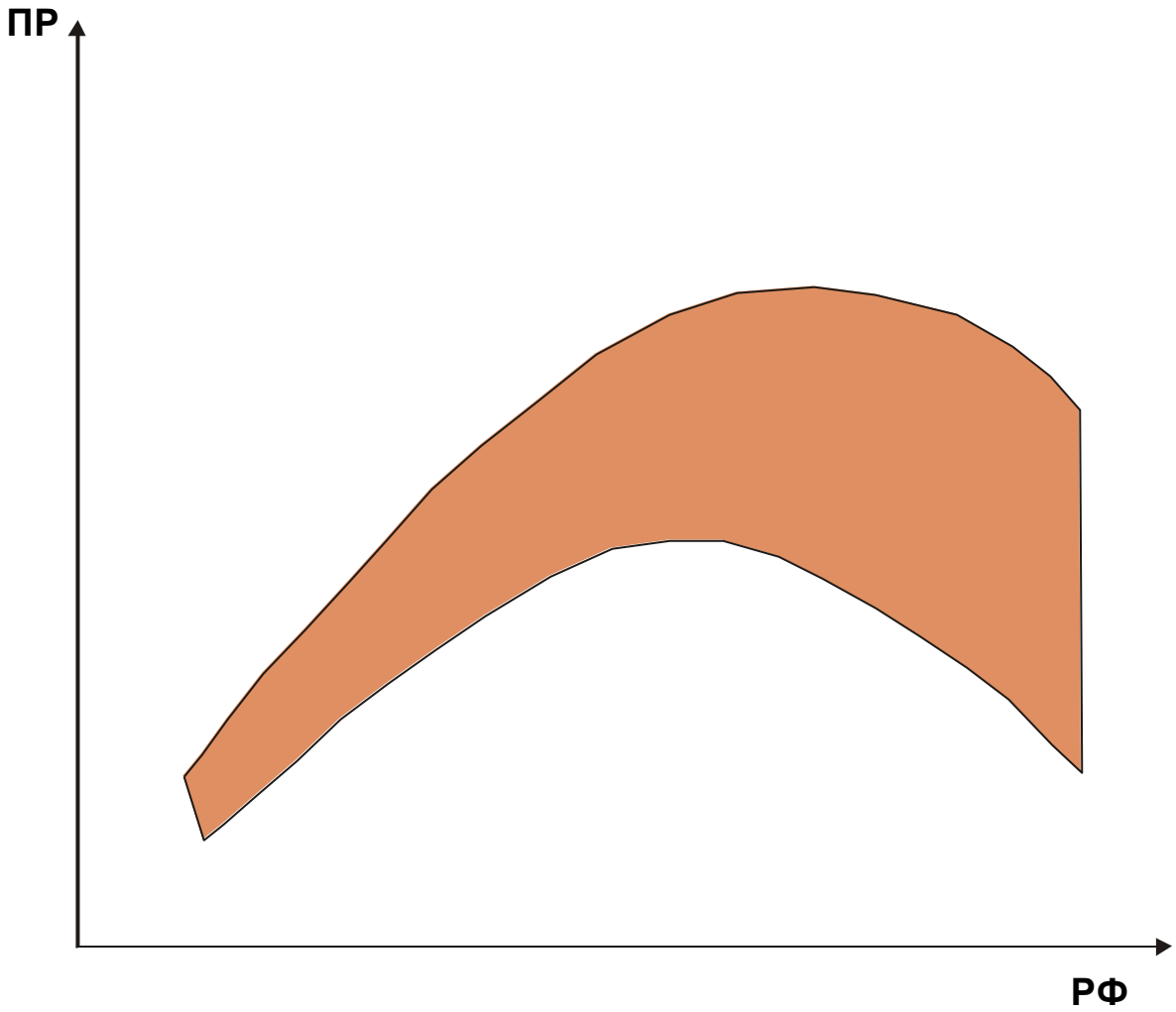

Рис. 1. Зависимость качества реализации процессов ПР от уровня рефлексивности (РФ)

Примечание: на графике представлена "трубка" значений качества ПР при изменении уровня рефлексивности (РФ), т.е. зависимость, учитывающая также и разброс величин качества ПР

Pic.1. Dependence of quality of DM procedures realization from the level of reflexivity (Rf).

Note: The index of values of DM procedures quality at the change of reflexivity level (Rf) is diagrammed here.

The General sense of the obtained relation is that the maximum quality of DM procedures takes place not at the minimum reflexivity (that is quite natural and understandable), but also not at its maximum value (that is already

less apparent from the prior point of view).

DM quality is maximal at some intermediate, though also high enough, value of the reflexivity. The latter is optimum in DM procedures. The same dependence can be interpreted a little differently. The initial growth of reflexivity results in qualitative parameters of DM procedures increase.

However, then the direct dependence between them runs up to the definite limit. At first, it stops acting in its straight form and then is transformed to reversed dependence.

This and others, obtained earlier, similar dependences demonstrate that, apparently, there is a certain zone, an interval of best values of reflexivity, at which the values of "external criterion" (activity efficiency, DM qualities, etc.) are the highest possible. "Shifts", both to reduction and to increase of reflexivity, result in decrease of "external criterion" values (in the conducted experiments – DM qualities).

Second, there is another experiment, which result is not less obvious. In the picture 1 it is visible that the range of dispersion of the values of dependent variable (DM quality) does not remain constant in all continuum of values of independent variable - personal measure of reflexivity.

Dispersion of values increases proportionally to ascending of the independent variable.

In other words, the increase of reflexivity degree simultaneously results and in ascending of variation degree of its correlation with the qualitative parameters of DM procedures. The higher is reflexivity, the more variative is its connection with qualitative - effective indexes of DM.

The situation is aroused, at which ascending of reflexivity as though grades, "slurs" the qualitative DMparameters dependence on it (though in the general view this dependence survives).

There are reasons to think, that the given result is explained by the fact that ascending of reflexivity measure results in strengthening of influence of number other "linked" to reflexivity parameter (e.g. neurotism, flexibility, empathy, cognitive complexity, etc.) on the studied dependence. Their influence on the dependent variable - DM quality - is rather complicated and ambiguous, and it is showed in the diversification of the dependence examined here.

The reflexivity that influences the DM procedures quality, changes and, basically, *increases* measure of the subject sensitiveness to the influence of many other subject and object factors on DM procedures.

Thus, the detected dependence has two main sides, double sense. On the one hand, it is a separate entity that belongs to the special kind of dependences - optimum dependences. On the other hand, the other dependence is "laid on"

it and interacts with it. It is an objective connection of its "freedom" degree with the personal measure of reflexivity.

The very reflexivity, acting as "an argument" of the DM qualitative parameters functionally depending on it, is simultaneously a determinant of this dependence diversification. There is a kind of "second-order dependence" – metadependence, which is "laid" on the basic ("primary") one, changing the measure of its strictness.

We have already reviewed such metadependences in the general methodology schedule and explained them by special diversified function of reflexivity.

The essence of this function is that reflexivity parameter along with its main influence on one or another variable can and, as a rule, exerts a certain additional influence.

Additional influence consists in dispersion increase – the measure of dispersion of values by the variable, the influence on which from the reflexivity direction is studied, at increase of the very measure of reflexivity.

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Going from the data, obtained at the effective level of research, to the stuff, characterizing the procedural level of the studied correlation of reflection and decision-making, it is necessary to note the following methodologically significant circumstance. The matter is, that this level of research is non-comparably richer in its content and much more multifaceted, than the effective level.

In this connection, there is a problem of the reasonable choice of those aspects of the analysis, which are most important and representative for the studied general problem as a whole.

We consider that objectively basic and main among them is determination of reflection influence not on any minor, individual peculiarities of procedural organization of DM, but its influence on similar, that is also main regularities of the organization.

It is well known, that the latter are defined as the *principles of procedural DM organization*. If reflection exerts its influence even on the most general regularities of the procedural organization, as which its principles act, then it influences all the rest - less general regularities and features of procedural organization of decision-making.

Today, we know a number of basic principles of procedural organization of DM (iterativeness, hierarchicity, unevenness, heterochronia, minimum sufficient differentiation, consolidation, target determination, and inter-assistance of components, etc. [5]).

The conducted researches demonstrate, that there are also such

components among them, which to the utmost are subjects to the influence of the reflectivity factor.

First of all, it is necessary to indicate the very essential transformations of one of the base principles of organization of procedural development of solutions - *iterative principle*.

The essence of the given principle consists in "spirality" of the DM procedure organization: it is formed not according to the type of linear - consistent process, but implies the systematic returns from the phases already passed to the others, preceding them; repeated "playback" and sequential enrichment, perfection of phases.

Owing to this principle, the intercorrection of stages is assured, and as a whole - the measure of internal conformity and integrity of all process is increased. Under the influence of reflexivity factor, the iterative measure of DM procedures is significantly enhanced, that within reasonable limits affects positively their total - effective parameters.

However, at the very high values of iterativeness a phenomenon of "hyperiterativeness" can emerge, verging to the procedural rigidity and to the rise of large difficulties of transitions from the process to the outcome - solution (and at the worst – a well known phenomenon of "analytical paralysis").

The changes in the pattern of the other relevant procedural principle operation – *the principle of minimally sufficient differentiation* are same much apparent and significant. The essence of this principle is that the organization of DM procedures is developed not by the type of summation and structuring of its phases, but by the type of differentiation of the initially integrated act of choice on the necessary procedural means, its phases act as.

The initially integrated and undifferentiated process of choice is differentiated and divided only into those phases and in such quantity that is minimally sufficient for its implementation.

In this connection, it is evident that the phases, described in the theory of solutions, can and should be reviewed as the products of choice process differentiation; and their quantity reflects one or another degree of its differentiation, procedural development.

For example, the stages of formation of concept of DM problem and the choice are required even at the most minimal degree of differentiation. The stage of the set of alternatives formation, concretizing by itself the stage of formation of the notion of DM problem, serves nevertheless as the product of further differentiation.

If it is necessary, this stage is supplemented by the stages of formation of the set of criteria and criterial estimation of alternatives, and the latter, if

necessary, is supplemented by the stage of probabilistic evaluation, etc.

The experiments show that the degree of the given principle expressiveness directly depends on the individual measure of reflexivity and is determined by it: the higher the measure, the higher is the differentiation between the stages (and sub steps) of the procedural solutions content.

Thus, it is necessary to distinguish two main aspects of reflexivity influence on the measure of the given principle expressiveness. First, highly reflexive individuals have higher differentiation between separate stages of the DM general procedures (i.e. they have higher process "graininess". Second, these individuals have also higher measure of procedural development of every stage. And, this second aspect of distinctions between high- and low-reflexive individuals is expressed in clearer form, than the first one.

The minimally sufficient differentiation principle is organically connected with another major regularity of DM procedural organization.

The matter is that, as it directly arises from the principle of minimally sufficient differentiation, the different stages have also a different "measure of necessity" in the process general scheme, and accordingly, different significance in the process implementation.

Therefore, by the given parameter, these stages form a definite *hierarchy* - from more significant and essential to less hierarchically significant, serving as the products of the former differentiation.

Thus, the *hierarchy principle* is another regularity of procedural organization of decision development. This principle regulates the structure and completeness of the stages presentation during, as well as their mutual subordination.

From these stands, the very concept of hierarchy as the mechanism of composite systems organization is also extended, as in the given context hierarchy is not a mechanism of structuring of either of formations, but the mechanism of procedural integration, diachronic organization facility.

Thereby, the hierarchy emerges not only synchronically (as the mechanism of structuring), but also diachronically (as the mechanism of dynamics, functioning).

Integrating the data on the influence of the individual measure of reflexivity on the degree of expressiveness and for these purposes using the concept of "the hierarchic systems theories", it is possible to note the following.

The reflexivity measure extends the "depth" of hierarchy of DM procedural organization (i.e. degree of hierarchy and mediation of its stages), but reduces "the rigidity" of this hierarchy.

All described above dependences are quite concordant. Their common

sense consists in the reflexivity significant influence on the measure of procedural organization of decision marking as a whole, and on the expressiveness of procedure as such. The higher reflexivity, the more differentiated and divided into stages, iterative and discursive the processes are.

However, we will note that, the procedural organization as such is, though also relevant, but nevertheless only one of the conditions of total outcome assurance- the quality of decisions.

It is important that, the organization, becoming *redundant*, can be transformed in the "over-organization", either causing decreasing the quality of decisions or completely blocking them.

For example, hyperiterativeness, which is demonstrated in unjustified "returns" with the purpose of examining and re-examining, can be decision inhibitor, acting as the one of the causes of well known phenomenon of "analytical paralysis".

Thus, the introduced stuffs demonstrate, that reflexivity parameter renders a significant effect on the most general plan of procedural organization of decision-making - its principles.

The difference of DM procedural organization of high- and law-reflexive individuals in many others specific aspects and schedules are not less, but perhaps even more expressed and apparent, visual and explicit.

Unfortunately, we cannot analyze all (or even the main) of these differences in the given article. Therefore, we will mark out, as an illustration, only some of them that are indicative in the light of the problems discussed.

So, high-reflexivity individuals use greater information content in DM procedures than low-reflexivity ones; these differences are specially expressed regarding the so-called "internal information" (and at a lesser degree concerning the "external information").

The high-reflexive individuals are more disposed to polycriteria representation of DM problems; in general, they are more tolerant to possesing not one, but several criteria, including the difficult-to-compare ones.

On the contrary, the low-reflexive individuals are more disposed to transformation of the polycriteria problems in the monocriteria ones.

The high-reflexive individuals have the bigger repertory of DM methods and strategies, but the quality of their implementation is relatively low. "Gaining" by the rich repertory, they "lose" in skill at dealing with it; for the low-reflexive individuals the inverse tendency is characteristic.

The high-reflexive individuals have more so-called "alternate dimension" of DM procedures, that is, they are more disposed to implementation of choice with larger number of alternatives.

Besides, the low- and the high-reflexive individuals are characterized by differences on one more significant parameter. Unlike the high-reflexive individuals, the low-reflexive ones are more inclined (and are capable) to simplify the choice situation, if it is really difficult.

And vice versa, the high-reflexive individuals are more inclined to complicate the choice situation, even if it is rather simple. The DM style for the low-reflexive individuals is drawn more towards the known pole "reducing", and DM style for high-reflexive individuals - to the pole "augmenting".

And, while in the problems on divergent intellection, in creative, theoretical problems, the second – "complicative" style is much more constructive, in the DM situations, which require "practicality", realizability and reality, the second "simplifying" style is often not only more winning, but quite often as the only possible.

Series of procedural phenomena, established in the psychological theory of decisions, contrary to already reviewed ones, is not significantly transformed under the influence of the reflexivity factor. They are, as though, "insensitive" and tolerant to the given factor.

Among these phenomena it is necessary to mark out, first of all, the "*deformations* (errors) of the rational selection" – "cognitive inclines" (biases), which are widely studied in the cognitive theory of decisions. They are described in detail in the scientific literature, the most known of which are, for example, "representation heuristics", "simplicity heuristic", "primary effect", "recency effect", phenomenon of "illusive correlation", "low count law", etc. [5,16].

The researches, conducted by us, have shown that, at first, measure of their changing depending on the variations of the reflexivity degree is statistically insignificant; second, these changes are unstable enough even in direction and sense (not just in value).

All this is evidence of the rather general and fundamental status of the phenomenon of "cognitive inclines", of its basic nature regarding the reflexive control and, therefore, of its definite independence of the reflexive control.

In the end, we shall note, that the high-reflexive individuals are more inclined to the operation with the probabilistic information, and also to the work with assumptions and suppositions, while the low-reflexive individuals prefer more definite information reference points.

At the same time, as experiments demonstrate [7], the high-reflexive individuals are characterized by relatively (not great, as it could be expected a priori) small efficiency of the operating with the probabilistic information, rather than low-reflexive ones.

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Adverting to the final of the formulated above main questions of the given article, i.e. the question of possible psychological mechanisms of DM procedures assurance, it is necessary to note the following principled circumstance.

As the DM procedures, according to our conceptions, belong to the specific class of procedural formations of psychics - to the class of integral procedures [7], then the question of the mechanisms of its implementation and assurance is identical in many respects to the question of the mechanisms of mental integration, its forms, regularities, means, etc.

Accordingly, the question of the reflection processes role is how specifically these processes realize their integrative functions, how are they included in the integral DM procedure. This is the question we brought up, analyzing the problem of possible mechanisms of reflection inclusion in the psychological assurance of the DM procedures.

The research on mechanisms and regularities of mental integration as a whole is, as is known, one of the significant theoretical problems of general psychology.

The given problem is especially topical in the course of cognitive psychology, and the researches on this problem are presented in it in very wide and various ways.

At the same time, until now, conventional problems of cognitive psychology obviously insufficiently include the analysis of the process, in which the mechanisms of mental integration are expressed more completely and more distinctly, forming its essence.

The matter concerns the decision marking procedure. In developed by us representations [2,4,5,6,7] it is showed, that by its psychological structure and substance the given process is synthetic and integral[2]. It is formed and developed as appropriate aim-conditioned integration of many other mental processes (cognitive, emotional, volitional, motivational) and formations.

Therefore, its very psychological nature and its status create adequate and even natural, necessary prerequisites for studying the general regularities and mechanisms of mental integration.

Thereby, DM procedures, being *the object* of research, realize the function of the *method* of solution of one of the main problem of cognitive psychology – analysis of mechanisms and regularities of mental integration.

On the grounds of the mentioned above general theoretic

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[2] Conception of integral psychological processes is thoroughly viewed, for example, in [2]; and its concrete definition regarding the DM procedure is given, in particular, in [4].

representations, we carried out a cycle of experimental researches on the possible mechanisms of DM procedures psychological assurance and in particular – on the role of reflexive processes in it.

At the heart of that cycle laid the combination of two methodical ways - method of *"polar groups"* and method of intercorrelation matrixes (with the subsequent analysis of the separate cognitive qualities and processes, found on the basis of matrixes structures).

In the beginning, the general selection on the basis of "polar groups" method [5, 6] is divided by the "external criteria" into three subgroups ("the best", "the middling" and "the worst"); the quality of DM procedures implementation acts as "external criteria" of this differentiation.

Then, in two groups ("the best" and "the worst") the procedure of psycho-diagnostic examination, directed towards determination of the development level of the main cognitive qualities and corresponding with them cognitive processes, is carried out.

Apart, we should note that this examination included the diagnostic of the development level of reflexivity[3].

Then, according to the outcomes of psycho-diagnostic examination, method of determination of inercorrelation matrixes, diagnosed qualities and processes is implemented.

The given method is necessary to regard as different than analytical, as a structural method of analysis of subject-procedural determinant of one or another mental phenomena.

This method helps to reveal and to describe the determination of a phenomenon not only by its analytical – "single" connections with the separate personal qualities and processes, but also by its complex and structural conditionality by their integrated subsystems.

The subsequent analysis of the matrixes and constructed on their basis correlograms was conducted by means of definition of their "leading" and "base" qualities[4], as well as on the basis of the complex of methods of "the

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[3] In that way, it was possible to study the role of reflexive processes, mechanisms, and characteristics of the subject in the general integral structure of cognitive processes, ensuring the preparation of decision and decision making.

[4] The "leading" are those qualities that have significant direct correlation with an external criterion, towards which a definite structure of qualities is functioning (in our case, it is quality of DM procedures). "Base" qualities are the qualities that have the heaviest "structural weight" in any of its integral structures. Better to say, they are qualities with the largest number of correlations with the other qualities and these correlations are the most significant. They are more important for the qualities integral subsystem structuring. They can and should be interpreted as *structure-forming* qualities, as the synthesis and structuring of all other qualities is carried out "around them".

correlograms indexing", specially designed in the course of the structural approach to the mechanisms of mental integration analysis [4,5].

Thus, the most significant are three following indexes.

First of them is index of structures (correlograms) *coherency* - ISC; it is determined as a function of number of positive significant connections in the structure and measure of their significance.

Thus, usually we take into consideration the connections with the significant value of $\alpha = 0,99$ and $\alpha = 0,95$; former are added the weighting coefficient of 3, and the latter - the weighting coefficient of 2.

In the number of cases the connections with the significance value of $\alpha = 0,90$ (with the "weighting coefficient" of 1 mark) are also considered.

Data, obtained of all structure "weights" are summarized and it gives the quantitative value of the index.

The second index is the index of the structures *differentiation* (ISD); it is similar, but formed on the basis of generalization of significant negative correlation connections.

The third index - index of structures organization (ISO) is a function of total of positive and negative connections, as well as their significance; it is determined as a module of ISC and ISD.

As a result of the analysis, the following main regularities, opening the peculiarities of reflexive mechanisms and the means of DM procedures assurance, were established.

First, it was detected, that by χ^2 criteria the structures of cognitive qualities in two experimental subgroups statistically are for certain *heterogeneous*. These subgroups are formed on the basis of significant distinctions to "external criterion" - DM procedures quality ("successful" and "unsuccessful" subgroups).

Thus, in the "successful" subgroup the *integration degree* of cognitive processes is significantly *higher*. The same subgroup has significantly smaller "*structure divergence index*", and also larger "*index of general organization*".

Second, the "successful" and "unsuccessful" subgroups (by external criterion – DM procedures quality) essentially differ by *leading qualities*.

So, in the "successful" subgroup, significant correlative connections (both positive and negative) between the *separate* cognitive qualities development degree and external criterion - DM quality are virtually completely lacking.

The existing connections are represented sparsely and even then, usually, only at the tendency level (i.e. with $\alpha = 0,80$).

On the contrary, in the "unsuccessful" subgroup, such connections are revealed; in other words, the fact of existence of leading qualities, as such, is

diagnosed in it.

Hence, one might see, that in the "successful" subgroup, the DM procedures determination by *structural effects* (greater integration and organization, smaller differentiation) is stronger, but "analytical" determination, i.e. conditionality by independent influences of cognitive qualities taken separately, is weaker.

In the "unsuccessful" subgroup, quite the contrary, the "analytical" determination of DM procedures efficiency is stronger and the "structural" one is weaker.

Third, in the "successful" subgroup, reflexivity is not a leading quality, while in the "unsuccessful" subgroup, there is a tendency to it, as the $\alpha = 0{,}90$ correlation between the level of its development and " external criterion" (DM quality) found in this subgroup.

It means, that the very type of the DM procedures determination in two subgroups is a bit different.

There is more direct DM procedures determination by reflexive processes in the second subgroup; while in the first subgroup there is not any of such connections or, rather, it has more mediate nature and consequently is not showed in the correlative dependence.

It follows that, the DM procedures direct determination by reflection is not effective, as it is characteristic for the second subgroup (i.e. for "unsuccessful").

DM procedures determination by reflection through the structure and mediate influence, not through the principle of direct conditionality, is more effective.

Fourthly, in the "successful" subgroup, *reflection is a base quality*, that is, the quality that has the greatest number of correlative connections with all other qualities and the greatest significance of the connections. In the "unsuccessful" subgroup, such regularities are not to be observed.

In our opinion, this very result is the main and the most indicative for determining a real role of reflexive processes in the DM procedures assurance.

Therefore, reflection, being the base quality, simultaneously acts as a structure-forming quality for all the rest cognitive qualities, ensuring decision marking.

Integration, which is the kernel, the content, and, probably, the *mechanism* of DM procedures as a whole, is developed on the basis of this reflection.

The reflection cannot and, apparently, should not directly influence the qualitative parameters of DM procedures.

This influence is much more complex, but more profound at the same

time; it is formed not by “summative”, “analytical” determination principle, but by the structural determination principle.

The reflection role in the integral mental DM procedure can be described as “organizational”, synthesizing.

Reflection is the very integrator of all the other cognitive processes, which are directly involved in decision marking and ensure its outcomes.

Regarding the cognitive area, function of reflection apparently is to mediate, to regulate, and to some extent to coordinate the involvement of all other cognitive properties in the DM procedures.

Not having a high correlation with the DM efficiency and not predetermining it directly, it exerts more mediate, but at the same time more profound influence on decisions. This property serves as the integrator, the regulator of the form and measure of participation of the whole system of cognitive qualities in decisions assurance.

The latter, essentially, is nothing else than “the experimental indicator” of arbitrary, realized regulation (i.e. regulation based on the grounds of reflexive mechanisms).

Its efficiency and, therefore, decisions quality, are determined, as it is followed from the introduced data, by two determinants: first, by the general cognitive integration and, second, by its role in the reflexive processes.

In this respect, one can interpret reflexivity, in its procedural aspect, as realized, arbitrary controllable level of mental integration mechanisms as a whole.

Fifthly, it has been established that, there are no significant distinctions between “successful” and “unsuccessful” subgroups in the degree of development of the reflexivity as such.

Moreover, in the “unsuccessful” subgroup, this degree is even a little bit higher (though statistically insignificantly). This empirically established outcome results in the curious enough and not predicted a priori consequents.

Thus, it confirms the described above regularity, according to which there is no direct connection between the reflexivity level and DM capability.

Further, it demonstrates that, the more is the independent influence of reflexivity on DM procedures, the less is its structural influence on these procedures. Along with it, this result is evidence of the fact that the reflexivity development level is in itself by no means identical to its large structure-forming capabilities.

High reflexivity and expressiveness of the synthetic, structure-forming role of reflection are not congruous phenomena.

As far as it is concerned the use of terms “productive” and “unproductive”, in our opinion, the differentiation of two types of reflection

(and reflexivity) is rational - the reflection can be developed, but "unproductive" (and sometimes even "counter-productive").

However, reflection can be as well moderate by its level (absolute) characteristics, but thus, it is also "productive", having an effective structure-forming, integration potential (as it was shown in the obtained results).

So, the main conclusion is that the role of reflection in the psychological assurance of DM is a *role of integrator* of other, more "local" cognitive qualities and processes.

The efficiency of this role is quantitatively connected to the reflection development level by non-linear dependence: it is mostly expressed at some, though rather high, but not limiting value of reflexivity.

Besides, it is necessary to differentiate two types of reflexivity influence on the other cognitive processes integration, developed during decision marking: "productive" and "unproductive".

There is no single-valued connection between the level characteristics of reflection and the type of its influence on the integration of cognitive processes.

Moreover, at the very high values of reflexivity, the probability of it's "unproductive" or even "counter-productive" influence on the mechanisms of mental processes integration is sharply increased.

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Comparing the stated outcomes with two, described above, regularities (established, accordingly, at the successful and procedural levels of research), it is possible to make more general conclusion.

The point is that all three groups of the results gained are characterized by the *commonality of principle* of sense that is evidence of definite *meta-regularity*, which connects reflection with different aspects of DM procedures organization.

So, optimum relationship between the degree of reflexivity development and the quality of DM procedures is detected at the successful level.

At the remedial level, the similar, in essence, relationship between the degree of thoroughness and expressiveness of the main regulators of the DM procedures - principles of its organization - and its qualitative parameters is found.

And, in the psychological and cognitive mechanisms of DM procedures assurance, a fundamentally similar regularity - presence of the nonlinear connection between the reflexivity integrative mechanisms' efficiency and qualitative characteristics of DM procedures - is found.

In this case, there are also some optimum (not minimum or maximum) values of reflexivity, at which its role as the integrator of cognitive qualities

and processes is the most highest, effective, and efficient.

In the light of this general result, the capability for specification and correction of one of the main rules of modern meta-cognititvism – the rule of the place and role of meta-cognitive processes in the organization of mental processes, first of all, cognitive processes, is opened up [11,12,14].

The fact is that, reflection in its wide sense (as conscious control, arbitrary - realized regulation of activity, including above all, the intellectual activity) in many respects represents the system of *meta-cognitive control* processes and their regulation[5].

Thus, the thesis on the *direct*, linear dependence between the degree of advancement, expressiveness of meta-cognitive mechanisms and efficiency of cognitive activity as a whole, and intellectual activity, in particular [9,10,13,15] is one of the main rules of meta-cognitivism, which is formed either in obviously or - that is more often - is privately represented as an "implicit knowledge" (as "natural".)

The data, obtained by us, prove that such direct dependence (which is, again, seems to be the most evident and answering the "common sense") does not exist.

There is another relation: the efficiency of intellectual, and in wider sense - of cognitive activity, depends on the degree of influence (i.e. with the development degree, and also - situational and above-situational representation) of meta-cognitive mechanisms of non-linear optimum dependence.

It means that, low advancement and small role of meta-cognitive mechanisms inhibits the intellectual activity (that is quite explicable and natural).

However, as it follows from the experimental data, very high advancement and role of these mechanisms start to affect negatively the efficiency, productivity of intellectual activity and its separate functional components (for example, DM procedures).

In this connection, it is necessary to note that, the very relation was described earlier for connection of intellect and reflexivity as a whole (quoted from [8]).

Making an attempt to interpret the given regularity, we can offer the following explanatory hypothesis.

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[5] According to the conception of structure-functioning organization of reflection, developed by us, it is also appears as the higher, i.e. *meta-system,* level of organization of the psychological processes, which are based on two other levels – level of conventionally distinguished classes of processes (cognitive, emotional, volitional, and motivational) and level of integral mental processes.

Intellectual (in wider sense - cognitive) activity, as well as any of its particular aspects, has some specific to each of them system of own and relatively independent mechanisms. They can be advanced to one or another degree, which is the main factor of their efficiency and productivity.

Meta-cognitive mechanisms, first of all, act as so-called "helper", controlling, optimizing, systematizing, etc. their development [12,15]. Both these rules are quite natural and understandable; and have direct experimental verifications as well.

However, we should not forget that, meta-cognitive control, when it is most developed, is necessarily (i.e. - by definition) conscious, reflexively organized, and therefore *subjective,* control.

But, becoming conscious and subject-controlled, this control can deviate and often enough it deviates from those unbiased laws, mechanisms and principles, according to which the intellectual cognitive activity is organized.

Subjectivity as a whole (and the subject meta-cognitive control, in particular) generally do not coincide with the objective regularities of intellectual and cognitive activity, causing "deformations", deviations, mistakes in the latter.

There is a superposition and interference of two systems of cognitive activity management - objective and subjective.

The first one is identical to *objective* mechanisms of intellectual, cognitive functioning; the second one is identical to meta-cognitive mechanisms in their developed, highest shapes - the shapes of realized, reflexive control[6].

And if the second system starts either dominate or simply become comparable with the first one by influence force, then the efficiency and productivity of intellectual (and cognitive, as a whole) activity is reduced.[7] More general rule also follows from here.

The very essential part of all mechanisms and processes of intellectual activity, as a whole, and higher mental functions, in particular, is involuntary and unconscious, but it *should not be* like that.

Transfer of these processes into conscious, arbitrary controllable form

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[6] The special and most complicated question is eventually the question about the propriety and differentiation criteria of these very systems, as well as about their interconnection. We examined this question, particularly, in [6]

[7] Thereupon, it is appropriate to recall the parable about the centipede that was trying to keep an eye on every of its legs' movement and, as a result, could not move forward.

would mean the replacement of objective (and therefore - optimum) regularities and principles of their development by *subject* (and so - subjective) regularities and principles and, consequently, would reduce their efficiency.

It is clear that, the given thesis is of hypothetical nature for the time present, and requires the extra researches.

However, concerning the connection of the reflexive mechanisms and efficiency of DM procedures, it is directly arisen from the experimental results and can be regarded therefore as empirically demonstrated.

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