PERSONALITY REGULATION
OF DECISION MAKING
AND LEARNING EFFICACY

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On the basis of the two studies' material the effects of personality regulation of
intellectual strategies are discussed. Also the connecting role is shown of the goal-
formation analysis for the mutual enrichment of the Russian psychological theories (of
thought and decision-making) and the Western ones (of implicit theories of intelligence,
and of personality and learning goals).

In the first empirical study using Wason's tasks on the sample of 51 person the
substantial influences of different motivation types (according to the Edwards’ EPPS
questionnaire) and personal features like readiness to risk and subjective rationality
(according to the Personal Decision Factors questionnaire by Kornilova) on the stages
and characteristics of decision-making in different uncertainty levels are shown. Second
study, sampling 264 university students, discusses the influence of intelligence-personality
potential (implicit theories of incremental intelligence and enriching personality, IQ, self-
appraisal of learning efforts, self-appraisal of cleverness, and external appraisal of
cleverness) on academic achievement.

I. Motivational Regulation of Thinking and Decision Making

According to Tikhomirov's theory, human thinking is regulated by senses,
and motivational influences are discussed from the point of activity theory
view (Tikhomirov, 1988). In this approach not only stimulating and directing
functions of a motive are specified, but also its structuring function (Telegina
& Bogdanova, 1980).

Influence of different types of motivation on the intellectual processes
is presented in two types of experimental situations – of problem solving
and decision making. In Russian psychology motivational factors are
traditionally divided into two groups: internal and external factors. Internal
factors are reflected by the cognitive (epistemic) goals and represent the
dynamics of subject's cognitive processes. External factors reflect the deep
motivation which is not specific for the regulation of thinking only. So, from
this point of view deep motivation is an external construct in relation to the
internal regulation of thinking.
There are complex instruments of motivational indices measurement in psychometrical tradition in Russian psychology. For this reason we turned to versions of questionnaires of personal traits adapted on Russian samples. Different modifications of verbal tasks (which are classical for research in the field of thinking and decision making), such as explication of rule verification (Wason’s task with envelopes), prognostic tasks (prediction of consequences of interpersonal interaction), forming of concepts and multiple choice verbal tasks have been used in our studies.

At the same time we develop foundations of the sense theory of thinking, which are based on the activity approach in understanding the regulation of thinking. The main goal of our studies was to explore the interaction between subject’s personal activity processes connected with his deep motivational hierarchies and personal traits, which determine situational (here-and-now) decision making in the situation of uncertainty.

There have been different points of view on processes mediating decision making in Russian psychology (Kornilova & Tikhomirov, 1990). Intellectual decisions are mediated by functioning of intellectual strategies. Tatiana V. Kornilova is the author of functional multilevel conception of decision making. According to this conception, cognitive and personal motivational components of decision making regulation exist in multilevel dynamic interaction (Kornilova, 2003).

The author emphasizes the ideas of subject’s activity and openness of hierarchies in the systems of psychological regulation of decision making. Decisions are made by an intellectual person in the situation of uncertainty. Intellectual decisions are considered to contain convolute and short-cut structures of intellectual strategies influenced by motivation differently on different stages and levels of decision making process.

It depends on a classification of decisions, which cognitive and personal components are believed to be the main reference points for a subject who makes decisions. Some authors insist that the main role is played by probability components; others argue that intellectual components are the most important; some believe that the main components lie in morality domain. The level of subject’s decision making regulation is not specified in the characteristics of the chosen alternative. Dominance of different regulators on different stages of the choice strategy depends on a subject. A person himself can not be aware of which of new formations will play the leading role in subordinating of different goals. We assume that hierarchies of the processes of decision making in the situations of uncertainty are open. Our studies are based on both problems with limited number of alternatives, as well as situations in which multiple-stage intellectual strategies develop in.
Development of the ideas of subject’s self-regulation is an important direction in the integration of knowledge about decision making available in psychology. At the same time it is a relatively new direction in psychological research on decision making. The main goal of this approach is to identify those new formations which are intimately close to the context of self-realization (activity) of a subject in the dynamical systems of self-regulation.

The regulative role of personality factors in decision making was explored both with the help of computer-based models and with the use of practical problems. Several studies presented in this chapter are dedicated to reveal factors of specific and nonspecific motivation that can be viewed as components of intellectual regulation of decision making.

Although in multiple-choice problems orientation in problem field is considered to be short-cut, subject’s analysis of the direction of his strategy can be comprehensive: this analysis determines which criteria he or she finds to be more important than others. Maybe this meta-control of subject’s efforts particularly determines the specific feeling that has been referred to as “the burden of choice” (Janis & Mann, 1977). Another indirect index of subject’s activity in the study of the decision making situation is amount of time a person spends to prepare himself for a decision. One can refer to two characteristics of the decision search.

One type of prognosis processes is related to rationality as a comprehensive search for information. This process leads to the increase of decision making time. The other processes imply intensification of cognitive orientation and decreasing time. Changes in time spent on decision making are influenced by these types of prognoses. Analysis of the situation of choice can lead to evaluation of different solution alternatives’ eligibility.

In the situation of the computer-based model of a “Missioners and cannibals” task one could observe the effect of intellectual motivation in decrease of decision making time (Kornilova, 1990). Thus, the amount of time spent on decision making can act as a criterion for division of the decision making strategies into more or less effective groups. There is one more criterion. If a chosen alternative leads to achievement of a required result, subjective successfulness will be reflected in confirmation of prognosis underlying this choice. The higher effectiveness in confirmation of prognoses, obviously, distinguishes the group of more effective subjects. They spend less time on making an intellectual decision and achieve better results.

The study presented below had few goals. First, it was to reveal the influence of motivational factors on decision making. Second, based on definition of different sensitive stages and processes for particular type of
motivational regulation, we have explored possible interactions of personality and cognitive regulation of strategies in decision making.

Study 1. Motivational Regulation of Decision Making in Wason’s tasks

In the study Igor Kamenev conducted under our supervision influence of nonspecific motivation and motivation specific for the situation of decision making has been explored as dependent on a level of uncertainty (Kornilova & Kamenev, 2002).

The regulating role of decision making acts as well as their motivational conditionality in the context of the development of activity structures, is acknowledged by scientists with different beliefs about the nature of basic decision making. At the same time the peculiarities of the regulation of decision making acts are not often taken into account. In the present study the assessment procedure has been applied to clarify theoretical conceptions of personal cognition regulation.

Using problems with a limited number of possible solutions in their studies, scientists have tried to distinguish between nonspecific motivation (functioning in open-ended tasks as well) and motivation which is specific for decision making. One of the specific motivation components is readiness to risk. Personal readiness to risk is related to effective functioning and decision making in situations of uncertainty. The question about which scales describe different directions of personal motivation regulation of decision making remains open though. There is also no single answer for the question about the number of stages in the intellectual strategies, and about the possible influence of motivational foundations.

The questionnaire “Personality Factors of Decision Making” (PFDM, Kornilova, 2003) was used to measure indices of personal readiness to risk and subjective rationality. As it has been shown earlier, this questionnaire is suitable for revelation of significant relations between scales of self-regulation and different indices of intellectual strategies’ stages. The questionnaire included author’s assumptions about the processes of accepting the conditions of uncertainty and risk and was also based on the German questionnaire EQS (Enschiedungs – Q-Sort Methodik) (Kornilova & Tikhomirov, 1990).

The common procedure of the Wason’s task was also modified in our study – our goal was to provide individual with different levels of uncertainty. This did not require author’s reinterpretation of the processes actualized by the initial task. At the same time correlational study of interrelations between motivational indices and decision making indices could be useful to reveal
the structuring function of decision making motivation in conditions with different levels of uncertainty.

For tasks with a limited number of possible solutions subject’s orientation in the situation is considered to be short-cut because possible alternatives are presented to subject.

The hypotheses of this study included the following assumption: prognoses about the effectiveness of one’s actions are fixed in the feeling of subjective uncertainty – uncertainty one experiences in the situation of decision making. Both components of pre-decision are hypothetical, they are reconstructed on the base of indirect indexes. Another common assumption includes the following idea: the processes of subject prognoses of the situation construction (intellectual hypotheses) are influenced predominantly by the specific (internal, intellectual) motivation.

The first goal of our study was to establish the effects of motivational (both specific and nonspecific) factors on decision making. The second goal was to reveal the possible interactions between components of personal and cognitive regulation on the basis of the explication of sensitive (for each kind of motivation) stages and processes.

**Methods**

Our sample included 51 university students aged 19 to 23. Participants had to solve the modified Wason’s task meaning they were required to make choices in different uncertainty conditions. The decision making indices were obtained through use of “Modified Wason’s task” computer model (Wason, 1968; Wason & Johnson-Laird, 1972).

The logical structure of the rule was formulated as “If..., then...”. There were words on some of the cards, other cards contained letters. The conditions of uncertainty differed as well. Subjects made 2 choices in the first and in the second tasks (an intermediate choice and a final one) and one choice in the third task.

After the intermediate choice has been made the subject was asked whether his prognosis about the content of the latent side of the card was correct. After completing each of the tasks the subject estimated the subjective uncertainty of the situation on a 7-point scale. The quantitative variable of subjective rule confirmation was fixed in order to clarify the relation between the direction of subject hypotheses and reference points necessary for decision making.

All the participants filled the EPPS (Edwards Personal Preference Schedule (Edwards, 1959; Edwards & Abbot, 1973), modified by T. Kornilova (Kornilova, 1997) and the PFDM questionnaires. The last one
has been designed for measurement of the personal self-regulation indices reflected in subject’s decisions and actions. The first characteristic measured by this questionnaire is rationality – a tendency to make decision on the basis of the largest possible amount of collected information. The second characteristic is readiness to risk – inclination to rely on oneself and make decisions in the situation of uncertainty (Kornilova, 2003).

**Results**

1. **The effect of personal-motivational factors on the stages and decision making indices was revealed.**

Motivational tendencies of Autonomy, Abasement and Endurance influenced time variables in the first task. Abasement was significantly related to increase of time needed for intermediate choice processing. Autonomy significantly affected the increase of time needed for construction of the image of the task. Endurance was significantly related to the length of the path to the final choice (the second step in Wason’s task).

Other motivational characteristics predicted the shifts in the indices of intellectual choices in the second and third tasks with a higher level of uncertainty.

Self-knowledge motivation significantly determined the increase in subjective confirmation of cognitive hypotheses index in the first task. This type of motivation was also a significant predictor of the subjective uncertainty in the third task.

High values of self-knowledge motivation were related to the greater effectiveness of decision making. The possible explanation is that these participants are more likely to have a higher level of meta-control. This phenomenon can be observed when the final image of the situation is constructed (in the second task), while there is no influence of this motivational factor in the first task with higher level of uncertainty.

Significant effects of process influences were also observed in relation to Aggression and Dominance motivational tendencies.

We did not obtain the expected result of achievement motivation affecting decision making. This may have happened due to the short-cut goal structures (of situation exploration) operating in problems with limited number of possible solutions.

2. **More risky participants showed higher degree of confidence in a decision they made.**

Readiness to risk can be viewed as a specific motivation in decision making situations. It determines process features of strategies in the most uncertain conditions – when a participant has an opportunity to additionally
formulate the rule in the third task. Readiness to risk was also significantly related to effectiveness rule formulation in the second and third tasks (but not in the first one, where this rule was specified).

Readiness to risk and aggression had effects on the length of the instruction acquiring period (reflecting the process of situation image construction) in the third task where conditions were uncertain as much as possible.

3. Our data showed influence of rationality on the objective effectiveness of decision making. This fact was observed in the second task (with the medium level of the uncertainty).

4. The difference of the level of uncertainty of the conditions of three tasks had the following effects. Significant relations were observed between interception and readiness to risk and the effectiveness of choices in the second and third tasks; endurance and the effectiveness in the first task; aggression and rationality and the effectiveness in the first and the third tasks ($\chi^2$ – criterion was used).

Discussion

The following initial assumption has been confirmed in our study. Different processes of prognoses construction are involved in subject’s pre-decision. These include prognoses which refer to subjective reference points and possible consequences of subject’s actions. This assumption was indirectly verified by our data which revealed the partial influence of different motivational factors on different stages of decision making. Considering deep motivation indices measured by EPPS we have obtained the following results. The meta-control of decision making strategies was mostly influenced by the motives of abasement (as one’s predisposition to perceive oneself as the cause of failures in one’s actions), interception and endurance. The subjective direction of participant’s choices was significantly predicted by other kinds of motivation: autonomy, aggression and readiness to risk.

The following factors became clear in the analysis of motivational factors’ influence on the effectiveness and genesis of intellectual strategies. Participants with higher values on endurance and interception measures were more successful, because their results were more consistent with their expectations and rules they’ve been using.

Similar effects of readiness to risk and endurance (increase of confidence in choices one makes) give us the opportunity to interpret this preparedness in strategies as preparedness to cognitive risk. This means that one is able to accept the uncertain conditions and to act under uncertain circumstances relying on one’s hypotheses. Thus, being guided by the results obtained in
this study, we can explicit the influence of nonspecific motivation on the regulation of intellectual strategy. This influence can be observed in the process readiness to cognitive risk. Subjective estimates of uncertainty act as indirect indices of this preparedness measure certain aspects of subject's self-consciousness in regulating his cognitive activity both at the level of meta-control and at different stages of situational image construction and decision making.

This study explicates the process regulation of decision making strategies influenced by the motivational factors which do not determine the effectiveness of choices. One process can be influenced by different motives; these influences of personal factors differ according to the level of uncertainty, which varies in different tasks and on different stages of solution.

On other stages of search and at levels of other processes mediating subject’s activity in decision making other regulative systems could play the leading role and provide different effects of motivational influences.

Results obtained in this study once again support hypotheses of a structuring function of a motive. However, the idea of a structuring function of a motive in the situation of decision making should be reviewed. In a situation of problem solving this function can be viewed in a context of an effect of different types of motivation preliminary assessed. In decision making situations an intellectual orientation is presented in its short-cut forms and motivational effects are registered in a different way. They can be defined as extent of manifestation of different motives intensity in groups of participants with different types of cognitive forecasting regulation. These groups are defined on the base of different correlations between intuitive and discursive components of verbal prognoses.

We have shown that different types of deep motivation (measured by EPPS and PFDM questionnaires) can influence same processes or stages of decision making in opposite directions. At the same time different personality variables can be significantly related to the same stage of intellectual strategy. Thus, motivational influences can be defined as partial effects of dynamic regulative systems’ influence on the new formations which functionally prepare and realize future decisions.

II. Personality Regulation of Intellectual Strategies in Learning

Studies of a goal formation are connecting-link that allows to compare data obtained in Russian and foreign research projects in psychology of thinking and education. Motivational influences on goal preparation and intellectual strategies regulation are discussed in both studies of structuring
function of motive in decision making actualgenesis and studies of dispositional personality prerequisites including external and internal motivation and self-consciousness.

Discussions of individual differences in learning efficacy (or academic achievement) mainly refer to learning motivation and goal orientations related to motivation and efforts intensity as well as to implicit theories of personality and intelligence, self-efficacy, self-appraisal and other personality and situational factors. Theories that attempt to interpret influences of these factors can be divided into two main groups. First group of theories explicate direct interrelations between motivation, individual differences (such as intelligence, Deary et al, 2007) and learning strategies efficacy and academic achievement. The second group of theories can be referred to as combined theories. These theories consider the existence of mediating processes like self-efficacy, expectations, value of different goal orientations, engagement, self-assessed intelligence and other processes (Colquitt, LePine & Noe, 2000; Elliot & McGregor, 2001; Kozlowski & Bell, 2006).

In Russian psychology motivational conditionality of goal formation has been studied in its relation to external motivation (of achievement, competition etc.) and to internal (with respect to thinking regulation) cognitive motivation (Psikhologicheskie mekhanizmy, 1977). Traditionally in this approach in Russian psychology, methodologically based on activity theory of A.N. Leontiev (1978) notion of stimulating function of goal does not consider this goal to have a status of motive (there is a separate mechanism of motivation formation – a goal-to-motive shift). It means that different sources of stimulation need to be searched for, including searched in a sphere of interrelations between different-level psychological formations (on levels of self-consciousness, deep motives hierarchies and level of orientation on situational conditions of goal achievement).

According to the conception of dynamic systems of personality regulation of decisions and actions, goal achievement in learning activity should not be considered without taking a self-consciousness level into account. It has integrative function relative to different personality (and motivational) variables.

Diagnostics of those components of self-concept that are most closely related to motivation specific for learning activity includes the use of implicit theories questionnaires. Implicit theories has been first referred to as layperson’s beliefs about intelligence and personality (Furnham, 1988). These beliefs concerning oneself and others can reflect different aspects of self-concept regulative function in development of an internal specific learning motivation.
It is common to relate motivation of specific intellectual activities to a regulative level of a self-concept. At this level of individual consciousness, implicit theories that reflect the functioning of an individual’s everyday beliefs about intelligence and personality are presented to the subject (Reber & Reber, 2001; Sternberg et al, 2000). Carol Dweck studied implicit theories as factors of the internal determination of students’ learning process (Dweck, 1999). Her studies showed that people differ in their conceptions of intelligence and personality, tending to think of these psychological attributes in terms of a constant (entity theory) or malleable variables (incremental theory). These components of self-concept play a role in individual differences that have significant influence on efficiency of educational activity.

Analyzing the influence of implicit theories of intelligence on a process of formulating life and educational goals, Dweck noted that some people choosing goals focused first of all on results (performance goals). For these individuals, a positive self-esteem and an avoidance of failure are most important. Others choose goals focused on learning (learning goals). Students focused on mastering skills choose learning goals more often. Implicit theories reflect, in our opinion, also the regulative level of educational motivation.

As such studies are correlational, there is always an open question about which one of the personality variables – components of self-esteem, implicit theories or types of motivation – is the leading one. From the position of our concept of functionally-level regulation of intellectual decisions, one can assume the leading role of any of these traits of personal regulation (as well as of intellectual one) (Kornilova, 2003).

In schemes of regression analysis, the choice of the variable by which to study learning success as a dependent variable is not obvious. As Trost (1999) shows in his review, diagnostics of psychological factors of efficiency of educational achievements is an independent problem, in particular, because of low correlations of academic achievements with variables associated with the most common forms of intelligence testing.

Another question arises: are people with high analytical intelligence really considered by others to be more clever? For student’s samples, it is a question of how three parameters – measured IQ, academic achievement, and estimation of the student by others (revealing appraiser’s implicit theories as well) – are related. Our article is also devoted to a problem of correlation of intellectual variables and student’s everyday representations of distinctions in “intelligence” (or “mind”) with learning capability.
Study 2. Interrelations of Implicit Theories of Intelligence and Personality, Self-Appraisal of Learning and Learning Efficacy

We suppose that goal orientations play the leading role in an appraisal of activity (Colquitt, LePine & Noe, 2000; Blackwell, Trzesniewski & Dweck, 2007; Payn, Youngcourt & Beaubien, 2007). Goal orientations turn out to act as mediating relations of implicit theories and results of appraisal. However, we assume that there is a missing link in interpretation schemas proposed by different authors — self-appraisal of one’s engagement in goal formation and achievement. Student’s self-appraisal of his or her engagement in goal formation and achievement, unlike the concept of self-efficacy, is related not to beliefs in one’s success, but to the actual evaluation of involvement of efforts in the process of choice of action orientation, in learning strategies regulation, learning and effort intensity. Such variable can be measured with “self-appraisal of efforts in learning” questionnaire scale that we have developed (Kornilova et al, 2008). This scale is included in the modified version of implicit theories questionnaire as a complementary to implicit theory of learning goals. We supposed that an implicit theory “self-appraisal of efforts in learning” should be related to learning goals captured in measurement by the Dweck’s questionnaire and subject’s implicit beliefs about the nature of his intelligence and personality traits.

We have also developed a specific procedure called GAC (Group Estimation of Cleverness, Kornilova et al, 2008). Students ranged themselves and their classmates by “cleverness” based on the list of their class. The weighted mean rank¹ received by a student in a group — a variable of an external group appraisal of cleverness — was computed. The place that an examinee assigns in this rank-list to him or herself was used as a measure of self-appraisal of cleverness. The procedure allowed us to obtain data on self-appraisal of intelligence as “cleverness” in layperson’s representations. As it has been shown above, GAC self-appraisal of cleverness (SAC) was based on mechanism different from that of questionnaire-measured self-appraisal of learning efforts.

Thus, we consider self-appraisal as having a general function of learning activity self-regulation.

Discussions of interrelations of goal orientations and self-regulation in American literature usually refer to Bandura’s theory. Self-efficacy, a concept coined by A. Bandura (1997), acts as a mediating variable at a slightly different level. Bandura and his colleagues have discovered that students

¹ Note that GEC variables’ higher values represented lower “estimations of cleverness” scores.
with high levels of self-efficacy use more serious (deep) and skilled strategies, if they include self-appraisal and feed-back in meta-control. If level of uncertainty in actions is rising in an educational environment, the value of planning and self-regulation skills become more important. Evaluation and control of one's cognitive activity and use of all accessible resources for goal achievement is positively related to academic self-efficacy that is, in turn, related to students' confidence in mastery of academic content that predicts academic grades. Unlike Bandura, European researches are less cited when problems of self-regulation in learning are discussed.

C. Dweck (1999) has proposed the existence of two goal orientations (performance and mastery oriented goals). Zweig & Webster (2004) added the third goal orientation (performance avoidance goal orientation). Kozlowski and Bell (2006) have taken into account theories of goal regulation of H. Heckhauzen and J. Kuhl and proposed three-factor classification of goal orientations.

Use of implicit theories concept and self-regulation conceptions allows to include a self-consciousness level in broad range of learning motivation sources that can be discussed.

The idea that self-conscious structures can act as forms of self-regulation and motivate activity are concretized in development of A.N. Leontiev's activity theory approach (Stolin, 1983). However, self-appraisal of efforts in learning is not necessarily reflected on self-consciousness level. This self-appraisal can function as implicit theory having conscious and unconscious components of learning strategies regulation.

We assumed that self-appraisal of learning can be based on two foundations: 1) appraisal of goal achievement in activity as a common ground for comparison of oneself with other people; 2) self-appraisal as based on possible and made efforts, and other unconscious components of self-appraisal.

Self-appraisal of learning can be considered as indirectly presented in influence of self-estimation of personality and intelligence on academic achievement (Chamorro-Premuzic, Furnham & Moutafi, 2004). However, there has been no similar studies of neither influence of self-appraisal of learning nor self-estimated intelligence on learning strategies in Russian psychology.

Literature review of foreign studies corresponds with our assumption about personality regulation of intellectual strategies. Foreign studies of personality factors and learning motivation are focused on investigation of influence of implicit theories and related goal orientations on academic achievement with this influence being realized by means of learning strategies...
(Gonida, Kiosseoglou & Leondari, 2006; Chamorro-Premuzic & Furnham, 2006; Blackwell, Trzesniewski & Dweck, 2007 and others). Contemporary models (e.g., Payn, Youngcourt & Beaubien, 2007; Ford et al. 1998) show that academic achievement is influenced by implicit theories, learning goal orientation, achievement motivation, meta-cognitive activity and cognitive abilities and self-estimated intelligence as well.

Psychometric intelligence acts as an explicit measure of individual intelligence. Appraisal of other people uses other reference points with real goal achievement by others in the first place. However, level of psychometric intelligence should influence appraisal of one’s cleverness. A latent variable of cognitive ability – “intelligence” – is probably reflected by both types of measures: psychometric IQ and external appraisal of cleverness.

At the same time self-appraisal of learning efforts can be viewed as latent variable which interact with cognitive abilities in the process of learning. Self-appraisal of cleverness includes feedback in relation to achievements of others, i.e. interpersonal comparisons. Both self-appraisal variables are considered to reflect the common latent variable of self-esteem which influences regulation of goal formation in learning strategies and, thereby, educational achievement.

Varying theoretical interpretations in Russian and foreign literature of motivation sources affecting goal orientations, however, agree upon that mastery goal orientation and cognitive goals play important roles in educational achievement.

Considering studies of goal formation in Russian psychology (Tikhomirov, 1989; Psikhologicheskie mekhanizmy tseleobrazowania, 1977) and studies of motivation and goal orientations in learning in foreign psychology, we have elaborated hypotheses system for our study that had a few goals: 1) to reveal connections of subjective representations about a possibility of development of one’s intelligence and personality growth with academic success of university students; 2) to establish interrelations of psychometric intelligence variables and implicit theories (IT) of intelligence and personality; 3) reveal the relations of self-appraisal of cleverness and learning efforts with implicit theories and psychometric intelligence; 4) reveal interrelations of external and self-appraisal of cleverness and psychometric intelligence; 5) to evaluate predictive value of all the variables mentioned above in context of academic achievement.

**Methods**

Participants were students of two departments at Moscow State University (Lomonosov University) with a total n=264 (75 of them were
men): 190 students from the humanities department — psychology, and 74 students from the department of biocomputer science and engineering. All of them were 3rd or 4th year students aged 17–24 (Mean = 19.51, SD = 2.04). All of them have filled the Implicit Theories questionnaire (1, IT).

We took students’ GPA for the previous three semesters as a basic measure of academic success. Half of our students also had an additional measure: they received grades in a specific theoretical course (e.g., course of experimental psychology for students in the psychology department).

208 examinees (177 students in the department of psychology and 31 students in the department of biocomputer science) have gone through procedure of ranging their classmates (and themselves) that we called the Group Appraisal of Cleverness (2, GAC).

1. IT Questionnaire. Sergey Smirnov’s Russian version of three C. Dweck’s brief questionnaires (Kornilova et al, 2008) with the addition of new items reflecting self-appraisal of learning, approved on other samples, has been examined anew in our study for internal validity. The questionnaire included 28 statements in its final version, producing 4 scales: “a self-appraisal of learning” (an estimation of efforts put in achievement as well as one’s self-reference to successful or unsuccessful students); prevalence of representation about constant or “incremental” intelligence; representations about constant or “enriched” personality; acceptance of learning goals (with higher scores meaning orientation on process of learning and skill mastery).

2. GAC procedure (described above).

3. We have administered the R. Amthauer’s Intelligence Structure Test (3, IST, Gurevich et al, 1993) to all students (even those who did not participate in GAC procedure). General IQ variable has been used along with its three subscale: verbal, mathematical, and spatial.

Results

Results obtained in this study can be briefly summarized as following:

1. Correlation analysis has allowed us to accept hypotheses about positive relations of self-appraisal of cleverness with self-appraisal of learning efforts, external appraisal of cleverness by peers, acceptance of learning goals (as scale of Dweck-Smirnov questionnaire) and psychometric intelligence (IQ).

2. There were no significant relations between self-appraisal of learning efforts and implicit theories of intelligence and implicit theories of personality.

3. For psychologists sample (n=158), there was significant effect of self-appraisal (GAC) on intelligence only for verbal intelligence. Students with higher self-appraisal had higher values on verbal intelligence scale. This
indirectly speaks in favor of psychologists' representations of mind as, first of all, related to verbal abilities.

4. Significant influences of the external appraisal of cleverness on intelligence scales for psychology students in terms of general, verbal, and mathematical (except for spatial) intelligence were revealed. For natural-science students, significant effects were found for general and mathematical intelligence only.

5. In the psychologists sample low but significant positive correlations between IQ variables and exam results were revealed. All of them possibly reflect a wider context of the examinee's intellectual development that influence both educational achievement and intelligence testing results.

6. Significant positive correlations between both parameters of GAC and GPA were established.

7. Regression analysis of variables predicting academic achievement showed that the β-coefficients were significant for the following variables: external appraisal of cleverness, self-appraisal of learning efforts, and learning goals acceptance (the last two as IT questionnaire scales). Both scales act in the same direction as predictors of academic achievement. The self-estimation process represents students' involvement in the learning process and better than other IT questionnaire scales indicates future academic achievement.

Self-appraisal of mind, IQ variables, acceptance of implicit theories of incremental intelligence, and enriched personality didn't act as significant predictors of students' GPA and were automatically excluded from the model when stepwise method was used.

Discussion

Data obtained in this study do not speak in favor of the hypotheses of a role of self-appraisal of cleverness and psychometric intelligence as significant predictors of students' academic achievements.

The self-appraisal process represents a contribution of personal efforts made during learning activity organization and testifies to the productive role of self-consciousness. Self-appraisal as a component of self-concept acts differently in everyday representations about one's cleverness as reflected in a rating procedure and IT questionnaires. Two kinds of representations have different contributions to a prediction of students' academic success and have different correlations with intelligence and GPA.

Self-appraisal of learning based on Dweck's theory can be considered to be valid in relation to a scale of self-appraisal of cleverness based on the GAC procedure: there are substantially uniform bases of students' appraisals of cleverness and active engagement in learning process, but these
representations differ in their regulative potential. Our data allow us to assume that they have varying degrees of proximity to conscious layers of students’ self-concept. In everyday representations of mind, specific motivation of learning is presented in a lesser degree than estimations of the mind of others and implicit theories of intentional orientation on educational activity. Thus, we assume that self-appraisal of learning as appraisal of one’s effort made in learning activity is presented to self-conscious of student and can be revealed. This can be made with use of the scale we have developed.

Giving their direct appraisals of cleverness, students are guided by those components which also predict intelligence testing results of their classmates. These appraisals and evaluations show high prognostic value (with a nonsignificant contribution of intellectual scales as predictors of achievement). Self-appraisal reflected in ranging procedure shows more latent and generalized components of self-concept than a self-appraisal of learning efforts.

Thus, implicit representations about mind of other persons, including the communicative aspects, appear to be better instrument for prediction of academic success than self-appraisal and results of intelligence tests as well. However, reference to self-appraisal of cleverness as well as results of intelligence testing do not cover the broad range of psychological variables involved in the regulation of academic achievement.

The fact that better exam results were found for students who were appraised by the group as being more clever can be considered as a proof of the high convergent validity of the psychometric intelligence test and GAC procedure (referring to everyday representations of intelligence).

Regression analysis has revealed that external appraisal of cleverness had the largest contribution as a significant predictor of exam results and GPA. R² change was at its maximum when this GAC variable was entered into our linear model. The process of social comparisons is more effective in terms of appraisal of intellectual achievement than self-appraisal or even IQ. However, we can also conclude that from all the IT scales, those that reflect self-appraisal processes (of learning effort and goal acceptance) can be considered as mediating involvement of self-consciousness in regulation of learning activity. Implicit theories of incremental intelligence and enriched personality do not act as those mediating processes.

We have shown that only two (self-appraisal of efforts in learning and external appraisal of cleverness) psychological variables in our study appear to be significant predictors of educational achievement.
External appraisal of cleverness revealed by GAC procedure acts as a significant prognostic variable of students’ exam results. Variables of psychometric intelligence concede to it. Self-appraisal of cleverness, reflecting everyday representations about mind, is related to level of educational achievement, but does not act as its’ predictor. Though, self-appraisal of cleverness can be considered as a variable mediating self-concept and psychometric intelligence. From the set of implicit theories: of “incremental intelligence”, “enriched personality”, “acceptance of learning goals”, and “self-appraisal of learning efforts” the last one acts as a significant predictor of academic achievement showing that specific motivation (of educational activity) is represented in it.

Results of this study allows us to propose hypothetical model, integrating all the variables and based on including of self-appraisal and external appraisal of mind as interacting mediating latent variables as presented on Figure 1. Empirical evidence for eligibility of this model will be presented in a distinct paper.

III. Summary

Both of the studies presented in this paper demonstrate that personality factors in regulation of thinking strategies should be taken into account as mediating decision making (Study 1) and learning strategies (Study 2). Both studies make their contribution to understanding of regulative role of such personality factors as self-appraisal and motivation. According to
our conception, this regulative role is being realized by dynamic regulative systems which include conscious and unconscious components. Self-appraisal and goal orientations in intellectual strategies and learning represent the components of conscious regulation in these systems. Motivation and implicit theories affect thinking as unconscious regulative components.

Thus, psychological dynamic systems of self-regulation involve the processes of different levels; they mediate the interaction of cognitive and personality components of regulation of thinking thus complexly determining the microgenesis of cognitive strategies (Kornilova, 2003). The level of metacontrol is represented by the variables of deliberate self-regulation and specific motivation of uncertainty situation overcoming (for instance, risk readiness) (Kornilova, 2007).

REFERENCES


