Influence of internet – activity for people’s cognitive abilities

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Abstract

The experimental researches (2004-2011) of memory, attention and thinking of the internet – activity of children aged 10-12, 14-16, of students aged 18-20, and of old people aged 25-40, allows to concern that longer (up to three years) and systematical (up to four hours every day) internet using makes the influence for the productivity of cognitive abilities. The research proved that:
- the increasing of memorizing speed of the essay and complex nonverbal material by internet-active school children and students with the period of using internet resources over three years, in comparison of the results of control group and other experimental groups with lover period of internet-activity;
- the decreasing of memorizing speed of the complicated nonverbal senseless material by students and old people with the period of using internet resources over 10 years, in comparison of the analogous indexes of students and old people with the period of using internet resources more than six years;
- the growth of thinking abilities’ productivity and the decreasing of attention abilities’ productivity of school children with the period of using internet resources over three years, in comparison of the analogous indexes of the users with the period of using internet resources till 1.5 year and from 1.5 to 3 years.

Psycho-pedagogical research of meta-memory processes of internet-active students aged 18-19 with the period of using the internet resources over ten years, revealed non-favorable signs for the effective functioning of theirs memory; lower level of the nervous system activity; non-appropriate species of the hemisphere’s activity for the produced load; the activity level of theirs’ nervous system was non-appropriate for the load’s complication (high activity of the nervous system with memorizing relatively easy material).

Keywords: memory research; internet-activity research; internet-player’s research.
1. Introduction

Studying the cognitive abilities of human, that systematically are using different views of informational technologies, will allow us to predict the human’s life regularities in conditions of informational society, in connection with appearance of new possibilities of need’s gratification, with taking into account the abilities, which do provide for studying and aim’s achievement in cyber-space. How cognitive human’s sphere does functioning in the virtual reality conditions? How cognitive processes that formed out in cyber-activity conditions do display in real world?

Abilities as instrumental characteristics of cognitive activity are stereotypic psychological processes, genetically entrenched and ontogenetically developed as psychological processes. The stereotyping of psychological process is conditioned by the character of human’s interaction with the world. Also it is conditioned by brain structures’ features, that involves its structural morphological’ specifics and reflex activity’s indicators. All increasing possibilities of internet-resource’s using are becoming necessity in interaction with the real world. There is clearly understandable, that longer staying in cyber-space does create the conditions for fixing new algorithms of behavior. Differently speaking, it does bring the stereotyping of new psychological activities. It means, that systematical using the informational technologies, as internet-resources, can born new and specifically transformed abilities.

We got data (Черемошкина, 2008, Черемошкина, 2009) about changes of internet-players’ sensory motor indicators (of students aged 19-20, playing in computer games no less than 6 hours per day, throughout last six years). We fixed out increasing of time of internet-players’ reactions for visual, manual and aural signal, as in a state of relative rest, so in the state of mental work. It can be evidence of speed reduction of processing information by active cyber-players already at the perceptual level.

Equally with absolute indicators of speed’s reaction for signal, that reflect central nervous system activity’s level, there was analyzed magnitude of the change of time’s reaction, i.e. activation of sensory areas at the intellectual work’s conditions. In particular, we fixed out lower functional possibilities of left-hemispheric sensory areas at the enlargement of intellectual work, in comparison with other groups of users and developers. The nature of activation of internet-players’ sensory areas were less adequate to proposed experimental material in comparison with control groups’ representatives. There was found pronounced inhibition for the second signal’s presentation of the same modality observed in active cyber-players. That gives evidence about changes of structural organization of functional system, that realize internet-players’ cognitive abilities. The present data allows us to presuppose the changes of micro genesis of functional systems of active cyber-players with the stage, differently speaking, about the nature of cognitive process, in particular mnemonic.

Micro genesis of functional system, that is realizing the concrete psychological duty, is the process of alignment of interaction of different psycho-physiological mechanisms for specific result’s achievement. In this connection there is evidently, that abilities, which are conditioned by genesis of functional system, by maturity of brain structures, of sensory areas, and by reprogramming mechanisms of cortical activity, would be changed in this statement, what is confirmed in A. R. Luria’s opinion. The proper external influence is necessary for starting process of forming up the concrete functional system. Arising again external stimulus is encouraging the production of new connections, i.e. new functional system, structural organization of which can be secured for longer time by the generalization of activity conditions and by its stereotyping. Developing this understanding there is a reason to presuppose, that different types of internet-activity are creating conditions for producing the functional systems, which are specific and probably limited by their own potential possibilities.

Developed abilities are realizing by different level mechanisms, as functional, operational and regulation mechanisms (Черемошкина, 2000, Черемошкина, 2009). Functional mechanisms are genotypic and due to the congenitally conditioned fundaments of abilities, and might be training (formed-up) including the processing and starting level of engagement of one or another analyzer system. Cognitive, communicative and playing activity, that is possible by internet-resources, is realizing mainly by visual perception. Therefore with big level of confidence we can expect the growing up of productivity of visual perception and mnemonic abilities, toward to clearly presented material that is conditioned by development of functional mechanisms.

Operational mechanisms of cognitive abilities are representing methods of processing information and of comprehension. They are formed out by consciousness of brain structures and by developing the subject’s intellectual activity. The type and condition of mental activity, the type of processing information are putting aside the imprint for qualitative originality (complication, diversity, flexibility in using) of operation cognitive size of human’s sphere. (Черемошкина, 2009).
Developing the operational mechanisms of concrete cognitive ability is due to the formation of most complicated mental behavior, that is oriented for organization integrated cognitive act form orientation till adaptation of possible result. Active internet resources using can bring, from one size, the appearance of new methods of processing information, and therefore, the changing of structure of cognitive abilities. On the other hand the virtual character of time space and social interaction does produce principally other conditions for creating and developing not only operational, but also regulation mechanisms of cognitive abilities.

2. Study design

The main target of present work, in the connection with information put in above, was the continuation of research about internet-activity’s influence on user’s mnemonic and mental abilities. User of internet-resources is appealing to net-work as for professional and cognitive, so for communicative and playing targets. Internet-resources are coming forward for users with that as conditions, in which everyday and professional activity does expand. In comparison with those, for whom creation the informational technologies is becoming consciously selected goal (as developers), or for whom staying in net-work is becoming motive having embodiment exclusively in cyber-space (as inhabitant). We considered stage and duration of everyday staying in net-work as activity’s indicator.

The regularities of memory’s developing and functioning of school children aged 11, students and adults (Черемошкина, 2000, Черемошкина, 2009), that we previously identified, led the expediency of studying the mnemonic abilities of internet-activity users given aged groups, and the necessity to forming up experimental groups (Черемошкина, Харитонов, Кузнецова, 2010). First with 33 children aged 11, second with 82 children aged 16, third with 62 students aged 18-20, fourth with 26 internet-users aged 25-35 with MA educations (as managers, system administrators, scientific teachers). There were created next experimental groups by questionnaire’s results:

- with internet-activity’s stage till 1-1,5 year; from 1 to 3 years; from 1,5 up 3 years; among schoolchildren,
- with the internet-activity stage up 3 years and up 6 years among students,
- with the internet-activity stage up 10 years among adults.

Length of active users’ staying in net-work was no less those four hours per day, and no rare than five days per week. The control population in 2 groups was created from non-users of internet-resources and no active users, with the duration pf spending time in net-work no more than 1,5 hour per week, with the stage of knowing internet no longer than half of year.

For studying the mental and mnemonic abilities there were used Raven’s test and Cheremoshkina’s method of deployment of mnemonic activity. (Шадриков, Черемошкина, 1990, Черемошкина, 2009). The second method is oriented on studying the efficiency of memory, developmental level, also qualitative originality of mnemonic receptions and ways of its regulation. Deployment method of mnemonic activity was done by using 10 cards with depicted figures with increasing complexity level that were created by direct warping lines.

The time of presentation of each card was: form first till 10th representation – 1 second, from 11th till 20th representation – 2 second, from 21th till 30th representation – 3 seconds, etc. Nonverbal nonsense material and the order of its presentation mentioned above allows us to „expand” the mnemonic activity and isolate productivity of mechanisms which are realizing that: functional, operational and regulation. In present research we estimate 3 indexes that were able by deployment method of mnemonic activity:

- the productivity of memorizing based on functional mechanisms: for this case card no. 2 has been used,
- the efficiency of memorizing able by functional and operational mechanisms: for this case card no. 3 has been used,
- the efficiency of memorizing able by functional, operational and regulation mechanisms: for this case card no. 10 has been used.

The time needed for memorizing the cards no.2, no.3 and no.10 were become as indicators in this research. More detailed description is presented in other works. (Черемошкина, 2009).
For receiving the additional information there has been used the questionnaire with 30 questions recommended in method of diagnostic the mnemonic abilities. (Черемышкина, 2009). After memorizing the material with different level of complexity the questionnaire allows us to make conclusions:
- about presence or absence of mnemonic receptions,
- about its quantity and diversity,
- about speed of including mnemonic receptions into memorizing process,
- about developmental level of regulation mechanisms of mnemonic abilities.

There were studying indicators of efficiency of mnemonic abilities of schoolchildren aged 11 and 16 with different stage of using the internet-resources, also analogical indicators of internet-active students aged 18 - 20 with stage up 3 and 6 years, and adult internet-active users aged 25-35 with stage up 10 years. Furthermore, we studied mental abilities of internet-active schoolchildren aged 16.

3. Results and discussion

Memorizing speed’s indicators of easy and sophisticated material of groups of children aged 11 are different but with out statistical importance (table 1). By those indicators there were found differences between internet-active children aged 16 and control groups with out the statistical importance too (table 2).

### Table 1
Mean indexes of efficiency of mnemonic abilities of schoolchildren aged 11 (seconds)

<table>
<thead>
<tr>
<th>Groups with different stage of internet-activity</th>
<th>Efficiency indexes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time of memorizing the easy material</td>
</tr>
<tr>
<td>Under 1 year</td>
<td>19</td>
</tr>
<tr>
<td>From 1 to 3 years</td>
<td>15</td>
</tr>
<tr>
<td>Up from 3 years</td>
<td>8,75</td>
</tr>
<tr>
<td>Control group</td>
<td>14</td>
</tr>
</tbody>
</table>

### Table 2
Mean indexes of efficiency of mnemonic abilities of schoolchildren aged 16 (seconds)

<table>
<thead>
<tr>
<th>Groups with different stage of internet-activity</th>
<th>Efficiency indexes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time of memorizing the easy material</td>
</tr>
<tr>
<td>Under 1 year</td>
<td>13,2</td>
</tr>
<tr>
<td>From 1 to 3 years</td>
<td>9,5</td>
</tr>
<tr>
<td>Up from 3 years</td>
<td>7</td>
</tr>
<tr>
<td>Control group</td>
<td>17,5</td>
</tr>
</tbody>
</table>

Studying the mnemonic abilities revealed significant differences in memorizing speed indicators of easy, complicated and sophisticated material between internet-active students with the stage up from 3 and 6 years, and adult users aged 25 - 35 with the stage up from 10 years. (T-student’s index p<0,05 – see table 3 and 4).

Identified tendency in the changes of memorizing indicators based on functional mechanisms does testify that the bigger internet-activity stage the higher speed of memorizing easy material. Differently speaking, higher productivity of memorizing based on functional mechanisms. Middle time of memorizing easy material by internet-active children aged 11 with stage up from 3 years does compile 8,75 seconds in opposite to 15 seconds, what is becoming as middle indicator of memorizing of group with stage from 1 to 3 years. Analogical indicator of control group was lower, than in group with internet-activity stage till 1 year, but higher for 5 seconds than in group of internet-active children aged 11 with stage up from 3 years.

Efficiency of memorizing based on functional and operational mechanisms of children aged 11 with internet-activity stage up from 3 years was 27,2 seconds, what is becoming the maximal result among selected groups. It’s worth to note, that analogical indicator of control group, what is 28 seconds, is lower from memorizing speed of both groups with internet activity stage till 1 year and from 1 year to 3 years (accordingly 52,2 seconds and 38,2 seconds).
Table 3
Mean indexes of efficiency of mnemonic abilities of students (seconds)

<table>
<thead>
<tr>
<th>Groups with different stage of internet – activity</th>
<th>Efficiency indexes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time of memorizing the easy material</td>
</tr>
<tr>
<td>Up from 3 years</td>
<td>4</td>
</tr>
<tr>
<td>Up from 6 years</td>
<td>3,3</td>
</tr>
</tbody>
</table>

Table 4
Mean indexes of efficiency of mnemonic abilities of users aged 25 – 35 (seconds)

<table>
<thead>
<tr>
<th>Researched groups</th>
<th>Efficiency indexes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet – activity users with the stage up form 10 years</td>
<td>Time of memorizing the easy material</td>
</tr>
<tr>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

Thus there were received results certified, that speed of memorizing easy and complicated material of children aged 11, who have stage of internet-resources’ using up from 3 years, is higher than of representatives of other experimental groups (at the level of manifested tendency with out statistical importance of obtained differences).

Children aged 16 with internet-activity stage up from 3 years were demonstrated better indicators of memorizing easy and complicated material in comparison to their contemporaries. (accordingly 7 seconds and 25 seconds – see table 2).

The time of memorizing easy material in all experimental groups is lower, than analogical indicators in control groups (accordingly 13,2 seconds, 9,5 seconds and 7 seconds to 17,5 seconds in control group). There was fixed out the speed’s increasing of memorizing nonverbal nonsense material in case of increasing the stage of internet-resources.

The difference in middle indicators of memorizing sophisticated material between experimental and control groups didn’t get significant importance. Efficiency of memorizing based on functional and operational mechanisms in group with internet-activity stage till 1,5 year was 28 seconds, in accordingly to analogical indicator in control group (30,5 seconds). With that the lowest success of memorizing sophisticated material has been noted in group with internet-activity stage from 1,5 year to 3 years with the middle level for 33 seconds.

The highest speed of memorizing the same kind of material was in group with internet-activity stage from 3 years - 25 seconds. Obtained results confirm tendency manifested in group of children aged 11: the bigger internet-activity stage the higher productivity of memorizing based on functional mechanisms, also thanks to functional and operational mechanisms of mnemonic abilities.

Productivity of memorizing based on functional mechanisms is twice higher by students than by adult users with stage up from 10 years (accordingly 4 seconds and 3,3 seconds in comparison to 8 seconds in last group). Speed of memorizing easy material by students with internet-activity stage up from 3 and 6 years is coming highest in comparison with analogical indicators of children aged 11 and 16. (4 seconds, 3,3 seconds of students and 8,75 seconds of children aged 11 with stage up from 3 years, 7 seconds of children aged 16 with stage up from 3 years).

It’s worth to note, that difference in productivity of memorizing based on functional mechanisms between groups of students with different internet-activity stage is minimal. Time of memorizing sophisticated material by students with stage up from 3 years is 5,6 seconds, and it becomes as minimal indicator in comparison to analogical indicators of other researched groups. With that the speed of memorizing that material by students with stage up from 6 years was 13,8 seconds, what is exceeding the indicator of students with stage up from 3 years more than twice (see table 3). Especially there is important to notify, that part of researched people couldn’t memorize most complicate task. Moreover students with internet-activity stage up from 3 years became more successful.
Indicators of efficiency of mnemonic abilities of users with stage up from 10 years (p<0,05) are significantly different from analagical students’ indicators in memorizing easy and sophisticated material (8 seconds and 28 seconds). These results are comparable with indicators of memorizing that material by children aged 11 and 16, having internet-activity stage up from 3 years (see table 4).

Speed of memorizing most complicated material by users with stage up from 10 years is more than 2 minutes. It’s worth to mention, that more than half of group (55%) didn’t realize that task sufficiently. Differences in efficiency of mnemonic abilities of internet-active students and adult users with stage up from 10 years are increasing at the moment of memorizing most complicated material (135 seconds in comparison with 45 seconds and 68 seconds of students with stage up from 3 and 6 years).

Thus obtained results do evidence about reduction of efficiency of mnemonic abilities of users with stage up from 10 years in comparison with analagical students’ indicators. Moreover obtained data is clearly presenting manifested increasing tendency of productivity of memorizing based on functional mechanisms, by children aged 11 and 16 and having stage up from 3 years.

Studying the mental abilities of internet-active chidren aged 16 has been realized by analyzing the results of Raven’s test.

In A. W. Kuznecowa’s research (Кузнецова, 2010) there were found significant differences of intellectual development between control group and group of internet-active children with stage till 1,5, year (at the level p≤0,001, by t-student’s t-test), also with group of stage from 1,5 to 3 years (p≤0,01). Data about percentage relation of researched people with different level of intellectual development in control and experimental groups are presented in table 5.

Table 5

<table>
<thead>
<tr>
<th>Groups</th>
<th>Percentage distribution of researched people</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>≤ 1,5 year</td>
<td>12</td>
</tr>
<tr>
<td>1,5 - 3 years</td>
<td>8</td>
</tr>
<tr>
<td>&gt; 3 years</td>
<td>17</td>
</tr>
<tr>
<td>control</td>
<td>22</td>
</tr>
</tbody>
</table>

Obtained results gives evidence about reliable tendency of increasing amount, that is noted in data of people with intellectual development’s higher level through first 1,5 year of internet-resources’ using. In process of internet-activity stage’s increasing there is observed tendency of growing the number of researched people with low indicators of intellectual productivity, despite the appearance of 8 % children with high indicators in group with stage up from 3 years.

Middle meaning of intellectual development indicators by Raven’s test, calculated separately for each group, gives evidence that level of intellectual productivity is growing up in period of using the internet – resources till 1,5 year (from 40,6 points of control group to 54 points), in period from 1,5 year and higher – is going down to 49,3 points, practically to middle meaning formed out earlier for present researched groups. Results of middle indexes calculated in Raven’s test are presented on the next page. Identified tendency indicate that mental abilities of internet-active children aged 16 do have bigger efficiency in comparison with analagical indicators of children with minimal experience of network’s interaction.

Analyses of results of selected series of Raven’s test, ald of indicators of memorizing gives evidence about reliable high level of severity of general mental operations. Simultaneously it indicates the complicity of orientation in nonverbal material of internet-active children with stage till 1,5 year. Maximal middle meaning of indicators of series „B” , „D” , „E” belongs to present group in comparison with others. Minimal middle meaning in data of test series’ were noticed in control group (accordingly 10,35 seconds, 8,22 seconds, 4,40 seconds).

The biggest middle meaning of indicators „A” seria belongs to researched group with stage up from 3 years (9,58), the lowest- to researched group with stage till 1,5 year (9,12). Results of middle meaning of indicators of each Raven’s test series’ are demonstrated in table 6 (next page).

Qualitative originality of intellectual abilities of children aged 16 with internet-activity stage till 1,5 year is characterized significantly high level of severity of grouping operation, seeking the analogy or abstraction (p ≤ 0,01).
Dynamic of middle indicators of efficiency of mental (intellectual) abilities of internet-active children aged 16

Среднее значение (баллы) = middle meaning (points)
Значение среднего показателя эффективности мыслительных способностей = middle indicator’s meaning of mental (intellectual) abilities’ efficiency
Средний уровень эффективности мыслительных способностей для данной совокупности испытуемых = middle level of mental abilities’ efficiency for present researched group
Контрольная = control group; ≤ 1,5 лет = ≤ 1,5 year; 1,5 - 3 лет = 1,5 - 3 years; > 3 лет = > 3 years.

Table 6
Middle meanings in all series of Raven’s test tasks of children aged 16

<table>
<thead>
<tr>
<th>Task’s series</th>
<th>Groups with different internet-activity stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 1,5 year</td>
</tr>
<tr>
<td>A</td>
<td>9,12</td>
</tr>
<tr>
<td>B</td>
<td>11,33**</td>
</tr>
<tr>
<td>C</td>
<td>10,15</td>
</tr>
<tr>
<td>D</td>
<td>10,00**</td>
</tr>
<tr>
<td>E</td>
<td>5,90**</td>
</tr>
</tbody>
</table>

** - significant statistical importance in comparison with control group by t-student’s test (p ≤ 0,01)

Reduction of results in Raven’s test of people with big internet-activity stage can be explained not so much by reduction of productivity of actually mental abilities, as by changes of cognitive process at whole. Exactly - growth of analyticity of perceptual activity, growth of awareness of information processing process, also increase of amount of new material processing methods. Indicated tendencies lead to a slowdown tendency of perceptive and mental-mnemonic activity. That is clearly showing during the memorizing complicated nonverbal nonsense material by internet-activity researched people with different age, what is describing by theirs’ questionnaire’s results presented below.
Answers on questions of researched children aged 11 let fix qualitative changes of operational size of mnemonic abilities with increasing stage of internet-resources’ using. In particular, there appears ability to memorize by analogy with any-thing that is good known: 90% of researched people with stage till 1 year, 90% of researched people with stage from 1,5 year to 3 years, 17% of researched people with stage over 3 years - noted attempts to find a similarity of memorized figure with something. Research people of control group answered negatively on that question.

Market growth in increase of awareness of grouping application is another important indicator: 82% with stage till 1 year, 63% from 1,5 to 3 years and 68% with stage up from 3 years in comparison to 60% of control group - could answer the question about what parts or elements of figure were difficult to memorize. Those answers were confirmed in questions about using the repetition. Answers for questions: did you try in any way repeat what you are memorizing – 80% of control group’s representatives answered affirmatively. With that among the involved into internet-activity people only 45% with stage till 1 year, 73% with stage from 1,5 to 3 years and 33% with stage up from 3 years noted presence of purposeful repetition of figures, of which memorizing by that way comes difficulty. That gives evidence about developed and developing orientation in material that is oriented mostly for understanding, analyzing and awareness of material, than for its rote learning. Internet-active children aged 11 didn’t strive for repeating material. They tried to finish the figure to understandable, familiar and acceptable form - 73% with stage till 1 year, 64% with stage from 1,5 to 3 years and 67% with stage up from 3 years in comparison with 60% in control group. There should be noted that internet-active children aged 11 for questions: did you try to understand arrangement of lines, did you try to assign in memorized figure triangles, rays, crosses, answered positively rarely than in control group – 91% with stage till 1 year, 82% with stage from 1,5 to 3 years and 84% with stage up from 3 years. That can give evidence about other variants of structuring material by internet-active subjects. Result of memorizing the figure № 3 in 52 seconds can attest about developing analyticity. The present tendency was fixed out early by us, during studying peculiarities of cognitive sphere of internet inhabitants. (Черемошкина, 2006, Черемошкина, 2009). Tendency in the direction of analyticity of perceptual activity, in our data, is prolonging the memorizing process significantly.

Results of memorizing easy and sophisticated material by children aged 16, and materials of answers from questionnaire, do confirm manifested tendency in group of children aged 11. Systematical and longer using the internet-resources does exert influence not only on functional fundament of memory, but also on operational and regulation mechanisms. In particular the speed of incorporation of operational mechanisms in memorizing process is growing. That testifies about interaction developing of functional and operational mechanisms. In group of children aged 16 with stage till 1,5 year and form 1,5 to 3 years more than 40% of researched people noted application of methods of working out material in memorizing process with card № 2, and 15% - already at the test set’s stage. With that 36% of children aged 16 with stage up from 3 years and only 15% representatives of control group were noted, that the time of inclusion the operational mechanisms in memorizing process is coming at fresh presentations, at the first talks of test’s set.

Qualitative configuration of mnemonic motions of children aged 16 with stage up from 3 years seems to be different by number of features. First of all, they do not use the re-encoding. Differently speaking, memorizing nonsense nonverbal material is not supporting by naming or marking. With that 27% of people with stage from 1,5 to 3 years, 36% with stage till 1,5 year and 23% representatives of control group were trying to accelerate memorizing process by re-encoding method. Possibly through our researched people there is much more internet-players, than the questionnaire’s results were show for us, and cyber-playing activity can take place with out the participation of speech, as it is known. Secondly, children aged 16 with stage up from 3 years didn’t strive to memorizing the increasing complexity material by analogy in same type. That can show their unwillingness or inability to simplify perceptible material. Possibly, the bigger stage of using the internet-resources the higher probability of presupposing, that subject is not including already know information into studying the new one. With that, despite these features in group aged 16 with stage up from 3 years, there are not presenting low indicators of memorizing sophisticated material. That shows the developing influence of internet-resources on system interaction of functional, operational and regulation mechanisms.

Indicators of internet-active students and adults (see table 3 and 4) about memorizing, also materials from questionnaire - let us fix the influence of internet-activity on different level mechanisms of mnemonic abilities. Very high speed of memorizing easy material by students does attest about high productivity of functional basis of their memory. It can suggest, that active internet-resources’ using in different aims does create the conditions for supporting the certain “tone” of functional mechanisms, what does find concrete efficient expression at the procedural or working memory’s level. In present situation it should be spoken exactly about procedural
or working memory, because operational mechanisms were activated in memorizing process at first presentation of tested card.

Answers as of students so of adult users are different. It is evidence not only about presence of conscious material handling, but also about developed regulation mechanisms. As adults users so students were preparing the plan of memorizing complicated and sophisticated material. They were looking for methods of control of memorizing process. Most of people were used structuring during memorizing 3rd and 10th figure by triangles, not by lines or sticks. Moreover the character of answers of successful and of those, who didn’t pass well with task, almost didn’t differ. Firstly there was assignment of stronghold, which became as structural unity of figure. In future special attention was given to intersections. Differently speaking, students and adults in all indicators are characterized by developed mnemonic abilities, which are expecting high results during memorizing material at any complication level. But in the present case more than 1/3 students with stage up from 6 years, and more than half of adult users didn’t realize successfully most complicated material. Possibly they tried to include all their own operational reserves already at the stage of memorizing complicated material. It can bring to quicker exhaustion with wish to switch into another activity. However procedure of experiment didn’t allow doing that. As result the regulation mechanisms some how are splitting. Inner regulation (planning the activity, control, correction etc.) is presented distinctly, but do not mate with the aim or sense of activity. Analogical results were obtained by us during studying the cognitive sphere of developers of computer programs with stage near 20 years and active cyber-players with stage more than 7 years (Черемошкина, 2008, Черемошкина, 2009), who were presented some deformation of regulation mechanisms.

Regulation mechanisms represent by itself system coordination of control, correction and other operations, activity of which is conditioned by strong-will determined and emotional motives. Therefore, if some forms of activity lead to strain of regulation mechanisms, it means the presence of negative influence on human’s consciousness. In present case internet-activity stage becomes as such factor. Using the internet-resources for receiving information is able to make influence on human’s consciousness by making influence on his memory as system of information’s organization in the aim of upcoming activity. In the case of actively using internet-resources by subject there is no necessity to memorize considerable massifs of information, because it is putted in constant access.

Social interaction in virtual space is attracting by anonymity and by possibilities of own self realization during the using new roles. Anonymity and often role’s changing do born stereotypic behavioral reactions with reduced conscious control and does create conditions for deregulation of psychical activity. Playing activity in cyber-environment is becoming powerful factor of involvement to the virtual world, where subject gradually is stopping to become, and activity of them is formed up by game and logic of game’s creator, no by his conscious and his personal logic. In the time the life of cyber-player becomes more complicated for coming back to the real world, where there is needed independently (on one’s own) to form up another behavior, and often correct (repair) results of own non conceived and spontaneous duties, reactions. Including the fact, that cyber-players with the stage do switch on all theirs’ reserves, even in the conditions of easy mental load (in particular, during memorizing easy visual material there are activated left hemisphere structures), it is easy to imagine the situation, when they are refusing from activity in conditions of complicated task, do not surviving neuropsychological exertion. Thus internet-resources’ using besides obvious advantages is able to provide also negative influence on psychical processes, in particular for cognitive activity’s regulation processes.

4. Conclusions

Longer and systematical using the internet-resources for cognitive, playing and communicational targets makes influence on human mnemonic and mental abilities.

The differences, identified by us, in the efficiency of memorizing easy, sophisticated and most complicated material, between students with internet-activity stage up from 3 years, up from 6 years and adult users aged 25-35 with stage up from 10 years do coordinate with early obtained facts, identified by us, about influence confirmation informational technologies as functional and operational, so regulation mechanisms of mnemonic abilities of active user (Черемошкина, 2006, 2008, 2009а, 2009б, Черемошкина, Никишина, 2008, Черемошкина, Никишина, Харитонов, 2009).
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