Gamers' Implicit Knowledge on the Psychological Influence of Game-Playing

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Abstract. The paper presents the players' implicit views on psychological aspects of a supposable influence of computer/online/video-games on human beings. And online survey with 74 Likert-type questions were given to adults and older adolescents (16+). The collected replies (N=437) were grouped into an eight-factor model. The key implicit representations include the participants' belief that gaming: (1) leads to positive self-development, (2) affects the players' somatics, i.e. causes tiredness and stresses while gaming and in an after-game period, (3) brings pleasing feelings while gaming, (4) stimulates cognitive processes, and (5) supports players' relaxation and gives pleasure.

Keywords: Psychology, computer games, adult players, implicit knowledge, online study.

1 Introduction

The aim of the study is to shed light on the players' informal views about the unspoken, hidden or informal parameters of the video/computer/online games they keep playing. Qualified gamers, rather than newcomers, are the primary interest. It is well known that most of the studies held previously have involved children and teenagers. Although young gamers may express an outstanding level of expertise, enforced by superior memory, excellent qualitative thinking and decision making, up-to-date self-monitoring, and rapid pattern recognition while engaged in gaming-related behavior [1], we nevertheless assume that their parents and older brothers/sisters usually have more broad experience in the field, and in result their informal views and feelings about the gameplay might be considered to be more competent and well-grounded. Thus the present paper is devoted to the study of the views on computer games shared by older adolescents and adult players (16+).

The study is limited to the population of Russian gamers; the limitation is hardly severe, if any. The estimated audience of gamers in Russia is about 20 million (http://www.entermedia.ru/about/); according to the results reported by a sociological agency COMCON, no less than 23% of adolescent and adult Russian citizens play computer games (http://www.comcon-2.ru/). They play all sorts of games, including console games, MMORPGs, action and adventure games, shooters, strategies, casual games, etc. Some of them subscribe to gaming portals abroad or buy original games

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and play using instructions in English or other foreign languages; the majority make use of localized versions of the games, i.e. adapted for the Russian players. Several Russian companies produce original computer games which have some popularity although they are not widely known outside Russia; probably only one world-wide popular game, namely the TETRIS, originated in Russia. A non-specified amount of non-citizens of Russia enter the audience of Russian gamers, including ethnic Russians who live abroad, and ethnic non-Russians (former Soviets) who speak Russian fluently and live outside Russia.

The current population of video/computer/online gamers consists of at least two generations: children, including preschoolers, grade school students prior to college, and adults starting with the college students and including parents of elementary school age gamers. Those adults who have a decade or more of gaming experience and who show no intention to cease active gameplay, are a group of special interest to social thinkers. Following the baby boomers generation, their younger brothers, sisters, and children, are expected to bring major changes in social behavior rituals in ways of doing business, in teamwork, and in sophisticated technological decision-making [2]. The generations of gamers have already made their choice when they openly absorbed playing video/computer/online games as an important element of their lifestyle.

A more detailed classification has been recently introduced by Tapscott [3] who separates a 'Baby Boom' generation (1946-1964), followed by an intermediate 'generation X' (1965-1976) and then by the 'Net generation' (1977-1997), also known as 'Millennials,' or 'generation Y,' – and lastly the 'generation Next' (1998 – present). «If you look back over the last 20 years, clearly the most significant change affecting youth is the rise of the computer, the Internet, and other digital technologies. This is why I call the people who have grown up during this time the Net generation, the first generation to be bathed in bits» [3, p. 17]. Digital enhancement, he believes, will result in partly discarding the older daily practices and in developing new values, dealing for example with non-trivial approaches to privacy, copyright, sharing responsibilities, management of identities, multitasking and other issues which are being mentioned and discussed in an anticipatory context in a growing number of publications [2; 3; 4].

2 Experienced Video/Computer/Online Players: Implicit Psychological Knowledge They Possess

We distinguish explicit vs. non-explicit knowledge concerning those parameters of video/computer/online games which refer to psychological properties, either stemming from everyday practice, or academic. After all, almost every human being is aware of some elements – theories, terms, effects, etc., which belong to academic psychology. Our main interest lies in non-explicit and non-articulated knowledge; this class of cognitions includes both tacit and implicit knowledge. The former comes from the Polanyi's influential book [5] in which he pronounced "We know more than we can tell." Intelligence theorists place procedural tacit knowledge to what Sternberg and his colleagues call practical intelligence [6]. Strictly speaking, it is important to mention that tacit knowledge is not the opposite to explicit knowledge. In other

words, implicit knowledge is slightly closer to explicit knowledge since it can be more easily structured and made overt, compared to the unarticulated tacit knowledge for which such a procedure is questionable. Moreover, implicit knowledge can be placed somewhere in between the two other types of knowledge, namely tacit and the explicit.

Computer/video/online gameplay experience is a promising area to try and shed some light on implicit elements of knowledge. Without a doubt, qualified players acquire profound erudition, apart from gameplay intricacies and small victorious secrets, about various ways the games may and perhaps do impact their psychic conditions. The more diverse games people play, the more informal observations they collect. That is why we believe the experienced gamers are preferable, compared to newcomers, to try to extract their implicit knowledge on psychology related matters.

One may think of diverse methods to do a sort of knowledge management in the field. For example, Turkle tracked a path via interviewing and observing [7], while Yee and his colleagues used an indirect methodology when they made visible social norms due to the analysis of the way the gamers use the avatars [8]; Allison and her colleagues had to undertake a psychiatric evaluation [9]. Wood and his colleagues, as well as Hsu and colleagues, surveyed players on the structural and design features of popular games [10; 11], while Teng used standard psychological tests (namely, Big-Five) to measure motivation and personality traits [12] – this author identifies the gained data with the gamers' implicit knowledge. This is not quite correct, to our mind, since psychological tests are instruments for psychological inquiry and generally speaking, these instruments differ from self-constructed classifications of private experiences; it would be rather strange if lay-players structured their implicit experience in exact correspondence with these sophisticated academic instruments. The players have for example little idea of the attempts of Will Wright, the "SIMS" creator, to apply the famous Maslow's hierarchical motivational scheme as the structural element of the popular game.

Thus our aim was, informally, to "drag out" of the gamers their implicit ideas about the impact of gameplaying, being a long and intensely practiced experience, on their psychics. Unlike the abovementioned studies, we planned to present a number of Likert-type questions borrowed from both our own decade-long experience of putting questions to gamers, and from published studies as well – too numerous to refer to them formally. The intention was to explicate at some level elements of the experienced gamers' knowledge and to try to build a certain structure of them.

3 Methodology

The goal of the study was to explicate and present the hypothetical implicit psychological aspects of the impact of the video/computer/online games on human beings. The main hypothesis was: video/computer/online players possess particular views on a supposable psychological influence of computer games on their psychological qualities. The expected would-be participants need to have, due to our plan, a long enough experience in gameplaying. Based on our experience with gamers, we have selected players of 16 years old and up. The youngest of our participants first, have had a prolonged experience in gaming, and second, as older adolescents, have been reflecting a

lot about their psychological traits, their destiny, future profession and in general their place on Earth. Those under 16 have been considered less competent in gaming and less reflective, or simply more 'childish'. The analysis of results was intended to provide valuable data pertaining to the study of computer game players' implicit knowledge.

It is important to note that in this paper we were expecting to gain a sort of a cumulative implicit knowledge which is characteristic for the whole population of experienced gamers, irrespectively of a particular type of a video/computer/online game he or she is an adept of. Moreover, it is reasonable to expect that almost any research participant has a personal history of playing or at least trying to play diverse games; this fact, be it true, might in fact result in an increase of confidence to the respondents' views. Although the moments such as the favorite sort of a player's game have been in fact collected, this set of empirical data is not being analyzed within the limits of this particular paper.

Measuring Instrument. The study was planned to be organized as an online; the authors have a good experience in this type of study. The questionnaire that was developed specifically for this study included two obviously different blocks: first, a block on demography and gamers' experience in playing computer games, and second, a block on psychological aspects of video/computer/online games' impact. All Likert-type questions in the second block were eleven-scaled; questions on demography and experience in playing games contained various numbers of scales.

The Questionnaire has passed a pre-study offline stage of approbation and adaptation within a sample of 58 gamers which did not participate in the following main study. The needed corrections were made to make particular questions sound more correctly and comprehensibly, and one block of questions was left out: the total number of the remaining questions is 74.

The Procedure was that of an online survey. The questionnaire was placed online. The invitations to fill in the questionnaire items were systematically posted on a number of particular portals, websites and homepages visited by computer gamers. The participants were self-selected.

Methods of Data Handling and Analysis. Processing of research results passed four stages: (1) analysis of demography and parameters referring to gaming experience of players; (2) statistical analysis of the questionnaires' items: calculation of the means and standard deviations; (3) explorative factor analysis (principal components method), targeted at stemming all the parameters into factors; (4) confirmatory factor analysis, aimed to check the resulting factor model and to find the intercorrelations between the factors. In this paper we do not have space enough to discuss the 2nd point in detail; it will be done only briefly.

3.1 Results and Discussions

The total number of self-selected respondents was 450, but the resulting number of non-identical responses was 437. As many as 13 responses were removed after the controlling aimed at preventing double visits from the same machine submitting the identical content.

At the *first stage* we analyzed the characteristics related to the players' demography and their experience in playing computer games. An average participant was a male (83%) of 16-21 years old (39%), going to university or having a college diploma (34%), with a 10-year experience in playing computer games (27%), playing about 25 hours per a week (46%). These results have no statistically representative scale to compare to; nevertheless, in our earlier studies with the Russian MMORPG players the demography was about the same, while 25 hours per a week allocated to gameplay is somehow a longer time than an average competent player reports; at the same time, among our earlier research participants were hard-playing gamers who played 40 hours per a week and more.

At the *second stage*, the calculated means and standard deviations show that the sample consists of players who are interested in playing computer games, feel emotions, express pleasure and great interest to gameplay. Players report they relax while gaming; although they say they rather rarely mix gameplay with reality, but at the same time in order to be successful they often practice a sort of identification with their within-game character, and in general they report that playing games promotes the development of their imagination. Participants tend to agree that they are often able to construct a dynamic model of the gameplay situations, their mastery means that they can operate automatically in various situations. They share their attention span between several meaningful components of the gaming process; they get used to it and do not find it too hard a task. It is easy for them to stay focused on game while playing, pay attention to important aspects of the game. Participants report that to be successful they need logical thinking and intuition, analysis and anticipation, making plans and look for alternatives, based for example on reasonable associations.

These are the issues which got the participants' highest scores.

At the *third stage* of the analysis we got an eight-factor model. The factors are as follows.

Factor 1 may be called **Control and attention**. It includes the key parameters of the allocation of control and the determination of attention. For example, the participants report that is necessary to keep the attention span active during the game (.50) and to distribute the attention span between several objects (.68). They believe their ability to allocate attention span to several significant elements is developing (.64) while gaming, that they progress in concentrating attention (.62) and in keeping control of a situation (.63). Participants also consider that they are able to track and control several significant objects in game without special effort (.57). Players report that gameplay causes their developing ability of finding out various proper decisions within the particular situations (.75), as well as the ability to carry on an analysis of a gaming situation (.82) and to plan the actions (.79). The ability to establish associative interactions during the game has also been marked (.59).

Factor 2 may be called **Negative consequences**. It includes the key negative parameters which might result from excessive gaming, or abuse/overuse of gameplay: for example, negative affect on dreaming (.57), after-game apathy (.58), sense of exhaustion (.80) and stress (.55), irritating feelings in eyes (.68), wrist pains (.56), unpleasing feelings located in a back and a neck (.71), intolerable excitement (.51), and aggressive thoughts (.63). Participants often find problematic to supervise themselves effectively during the game sessions (.60), and in general gameplay often makes them tired (.79), they feel they lose sense of time (.45). After game sessions,

participants report, it is often difficult for them to orient again in real life and to go on with their responsibilities (.62)

Factor 3 may be called **Interest to game**; it includes the following parameters: players report that the course of the game is not indifferent for them (-.47), they feel it easy to keep attention to gameplay situations (.51), gaming causes a great interest (.66), aspires to achieve success (.51); due to these pleasing parameters, players report they would gladly allocate all their free time to gaming (.52). The result of game for them is not indifferent (.41); the process involves them so strongly that they lose sense of time (.33). In general, gameplay brings pleasure to players (.48).

Factor 4 may be called **Self-development**. It includes statements such as players' belief that thanks to gaming they increased their self-assurance (.79) and self-esteem (.63), as well as capability to learn intensely and make use of what they get to know (.67), especially within new technologies (.47). Gaming, they believe, increases their creativity (.54) and develops imagination (.43). Thanks to gameplay, the participants report they became more responsible (.79) and more purposeful (.76). Experience gained in gameplay can be transferred, they report, to avoid failures in real life (.73), to classify real life situations adequately (.71), to realize their own capabilities and deficiencies unmistakenly (.69). The game players feel better in anticipating within-game situations and conditions (.59), they find less problems in concentrating the attention span (.53) and controlling situations (.56); they report they increase understanding of others (.65), and undertake risks much more adequately (.51).

Factor 5 may be called **Perception**; it includes key perceptive parameters: participants report that thanks to gameplay they increased a valuable ability to define the relative sizes of subjects and distances to them adequately (.66) and distinguish tiny details of the screen images (.75). Spatial imagination is developing while gaming (.76), as well as perspective models of within-game situations (.44). Gamers feel better in anticipating events (.48) and in concentrating the attention span (.47).

Factor 6 may be called **Thinking and memory**. It includes the following cognitive parameters: players report that logical thinking is valuable to progress in a game session (.54), that memory load dedicated to the within-game conditions is heavy (.74), that it is necessary to think and anticipate two steps (minimally) forward (.64), to think critically (.45) and in general to remember a lot (.71). While gaming, the participants report, the correct decision may happen and emerge unexpectedly (.49); thus, the abilities of building associative chains (.48) and to allocate significant elements (.43) are highly useful.

Factor 7 may be called **Self-knowledge**. It contains the following statements: participants believe that gameplay practice helps them not to stay lonely in real life (.45) and to be what they are (.52), they develop imagination (.49) and creativity (.51), approach their ideals (.63); moreover, they report they better comprehend themselves (.43), realize their own capabilities and deficiencies (.28). During the game sessions the participants enjoy identification with the screen character (.41) and in general are fond of a chance to pretend to be some other being (.49): due to this experience the participants believe they start understanding the other people better (.50). Finally, the very choice of games to play distinguishes the respondents from their friends (.44).

Factor 8 may be called **Game pleasure**. It includes the basic parameters of pleasure connected with gameplay: for example, participants consider that gaming is pleasing (.48), that it increases self-esteem (.29), helps to discharge the aggression collected earlier in a real life (.47) and causes a sort of a passionate affection (.56),

Participants report that during gameplay they may get a rest (.45), feel enthusiasm (0,68) and endure it (.65), find way to express their intuition (.44), and generally keep excitement after the gaming session is over (.41).

At the *fourth stage* the confirmatory factor analysis was used to check the statistical importance of the factor model acquired while doing explorative factor analysis. At the Figure 1 the Cronbach alpha meanings are placed within the balls with the factor names, and the Pearson intercorrelations are marked at the links which connect the factors; the least meaningful correlations are omitted.

Results of the confirmatory factor analysis show that the experimental data satisfy the suggested 8-factorial model: the value a hi-square equals 5223.416 with a number of degrees of freedom 2554, the value of index CFI (Comparative Fit Index) = .800, the value of index RMSEA (Root Mean-Square Error of Approximation) =.052. All the correlations between factors are positive and significant at .05. [13].

The following conclusions should be made after the analysis of the data presented at the Figure 1. Let us discuss some correlations which are reasonably high.

For example, the Factor 1 Control and attention correlates positively and significantly (.530) with the Factor 4 Self-development. This fact may be interpreted in the following way: high concentration, special attention and control over the events on the monitor are believed to promote self-development. High enough correlation with the Factor 5 Perception (.427) is also testifying that within-game control and attention are strongly dependent on the patterns of perception. Correlation with the Factor 6 Thinking and memory (.513) reminds us that control and attention is intimately connected with such capabilities as thinking and memory.

Factor 2 Negative Consequences is positively correlated with the Factor 8 Game pleasure (.492). Thus one can assume that while getting in-game pleasures, players are fully aware that among the after-gaming results they can acquire the negative ones, such as weariness, stress, etc.

Factor 3 Interest to game is positively correlated to the Factor 7 Self-knowledge (.427). Thus, interested players acquire a better understanding of themselves and are aware of their within-game as well as outside-game capabilities. Not surprisingly, high correlation with the Factor 8 Game pleasure (.610) shows that interested behavior leads to emotional enthusiasm and is capable to bring pleasure.

The Factor 4 Self-development correlates with the Factor 5 Perception (.453). Thus it is possible to assume that within-game self-developmental procedures promote the development of the perceptive system. The correlation with the Factor 6 Thinking and memory (.547) shows that self-development mechanisms are intimately connected with all the cognitions; the correlation with Factor 7 Self-knowledge (.613) shows that self-development and self-comprehension are believed to have common features.

Factor 5 Perception correlates with Factor 6 Thinking and memory (.505). That means, the cognitive capabilities – as the players' implicit knowledge says – form a unified block, including recognition, memory, logical thinking.

Factor 7 Self-knowledge correlates with Factor 8 Pleasure (.641). Thus a better understanding of him/herself within a game, promotes endured enthusiasm, emotional lifting and pleasant feelings.

Thus, the confirmatory factor analysis has shown that the factor model built-up using the explorative analysis fits the empirical data. Besides, correlations between the factors in the eight-factor-model testify that the present model includes a variety of interpretable correlations.

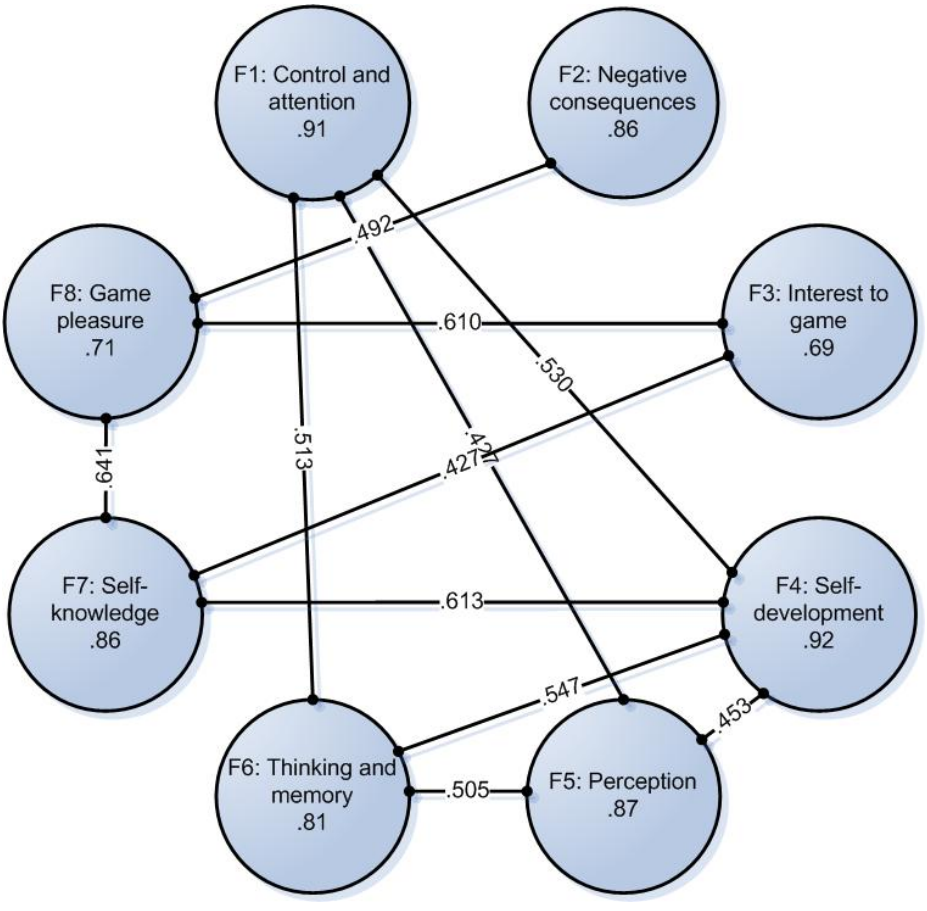

Fig. 1. Intercorrelations between the factors, and the Cronbach alpha

4 Conclusions

The final results of the study are the following. The participants, being qualified and experienced gamers, are ready to accept a multidirectional psychological impact of the computer/video/online games they keep playing. This impact is emotional as well as cognitive; it includes evidently negative outcomes as well as positive ones, in case we consider that self-development or knowledge about self is exclusively for good. Although the negative consequences form the second factor, the players do not seem to be concerned about the would-be losses in terms of somatic and/or psychic health. The participants express neither enthusiasm nor concern on the theme that gameplay is an uneasy element to be packed into their daily schedule; very likely, the lifestyle including gaming sessions has already been fixed and the participants find it comfortable.

All the factors are meaningfully intercorrelated in the resulting model. That means the model we present is indeed a well-formed model without isolates and chance

elements. What looks intriguing, within the gamers' structures of implicit knowledge there are kept the "ready-made" reasons which are for the most part overtly pronounced by both the proponents and the opponents of the video/computer/online games. For certain, the whole magnitude of such reasons is a "joint reservoir" and it would be interesting to learn what individual implicit models of this sort to look like, given future research opportunity.

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