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Key Dimensions of Contemporary Video Game Literacy:

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The history of digital games is dominated by two key developments: One is the rapid increase of popularity – the majority of the young generations in the industrialized countries belongs to the frequent or at least occasional game players (e.g., for Germany: MPFS, 2009a, MPFS, 2009b). The second is dynamic technological evolution and diversification. Modern digital game systems hold substantial immersive capacities (Tamborini & Skalski, 2006) and enable co-play of multiple individuals (e.g., Chan & Vorderer, 2006). Moreover, an increasingly broad range of platforms is available that can be used for playing, including mobile devices.

These developments are being discussed concerning various social, cultural, and economic implications. The issue of *media literacy* has received especially much attention in recent years (e.g., Livingstone, 2004; Potter, 2005). Calls for organized efforts to improve media literacy have been published by various institutions (such as the European Commission (2007)). In the context of digital game play, media literacy has been proposed as potentially effective mechanism that could protect (adolescent) players from undesirable game effects, most importantly, from the impact of game violence. Similar approaches are already being pursued in the context of TV violence (e.g., Cantor & Wilson, 2003; Scharrer, 2005). While there is a broad consensus about the importance of preventing negative effects game violence, other equally relevant dimensions of media literacy that competent gamers need to develop in order to meet the challenges implied by the recent developments of the digital game sector have received less attention. Moreover, the antagonistic role of media literacy in the game violence – aggression link is in need for conceptual (and empirical) specification. Therefore, this essay reflects on the implications of the contemporary developments in digital gaming for the conceptualization of digital game literacy (as a subconcept of generalized media literacy). Three dimensions of competence are proposed that mirror modern games' capacity to harm (frequent) players. The paper thus elaborates on one specific function of media literacy, that is, the protection of individual media users from undesired consequences of media use. Other possible functions of game literacy (such as the skill to maximize enjoyment, cf. Groeben, 2002) are not discussed here. The essay concludes with a brief outlook on required research on digital game literacy and practical game literacy education.

1. Resilience against (automatic) Game Effects

Many heavy gamers respond surprised or even angry to assumptions about game players' vulnerability to game effects, especially in the context of game violence and aggressive behavior. Laboratory and field research of recent years converges to the general finding, however, that harmful effects do exist. Most importantly, social-cognitive effects on antisocial and/or aggressive expectation schemata, attitudes, and norms have been demonstrated that need to be considered in the context of digital game literacy. For instance, Bushman and Anderson (2002) report short-term cognitive effects of violent video game play on hostile expectations players hold after game use (see also Kirsh, 1998). Intensive exposure to violent games and the hostile environments they contain may thus affect cognitive structures that also guide players' thinking and behavior in non-gaming situations. Krahé and Möller (2004; Möller & Krahé, 2009) report that adolescents who play violent video game frequently tend to display a higher normative acceptance of pro-violence attitudes – that is, they are more able and ready to justify aggressive conflict resolution. What is important about such effect studies is that many of the undesirable cognitive effects of video game play are automatic, unconscious processes (Uhlmann & Swanson, 2004; Kirsh, Olczak & Mounts, 2005). That means the effect occurs without players being necessarily aware of them (Greenwald, McGhee & Schwartz, 1998) and may even occur if players try to actively resist such effects (Wegner, 1994). In the unlikely case that players may note changes in their 'way of thinking', such as a self-observation of more frequent incidents of aggressive thoughts or feelings, a causal connection to the use of violent video game play would still be hard to detect for them. Thus, there is a risk of undesired and 'hidden' impact of video game violence on automatic-implicit cognition which then affects players' overall repertoire of thoughts, emotions, and social behavior in negative ways.

Automatic impact of games on cognition may not only relate to the domain of game violence and aggression. Rather, the social information that video games include may also trigger subconscious processing in players with similar consequences for post-play cognition. Stereotyping and outgroup processes are candidate domains for such social game impact. For instance, "War on Terror" military games frequently introduce soldiers from the Middle East as enemy forces to fight against (e.g., "Battlefield 2"; "Call of Duty 4"); their audiovisual presentation is mostly stereotypic and deindividualized (that is, "Arab" soldiers are presented as an anonymous group without any personal background information on biography, family etc., cf. Klimmt et al., 2006). This kind of social information may facilitate automatic processing that fortifies social categorization in players such as a negative automatic evaluation of "Arabs". Research on non-interactive mass media has documented such cultivation of mental representations of ethnic groups (e.g., Mastro, Behm-Morawitz, & Ortiz, 2007), and the interactive encounter with stereotyped groups (i.e., players fight themselves against these groups instead of merely watching them on TV) may even increase such stereotyping effects, as the difference between the players (ingroup) and the stereotyped group (enemies or outgroup) is very salient in the gaming situation.

In sum, the frequent exposure to (certain kinds of) digital games may affect players' cognitive structures in undesirable ways, and this effect occurs in part automatically – without conscious awareness. Therefore, there is no direct prevention strategy for

media literacy education (automatic information processing cannot be modified through conscious override, at least not always, see Bargh, 1994). Resilience against subconscious game effects is nevertheless an important normative goal for modern digital game literacy; because building media literacy implies to empower players to control the strength of impact digital games are allowed to have. Rising problem awareness that such automatic effects can occur seems to be a key task for media literacy promotion, as it is likely that players who rule out the possibility of themselves being affected by games are most vulnerable to automatic effects. Knowing about the possibility of subconscious effects may change the perspective on game play and, most importantly, post-play cognitive reflection, which then may buffer automatic game effects ex-post. While media literacy may thus not suppress game effects on automatic cognition directly, problem-aware gamers may be capable to avoid game-induced automatic thoughts (such as stereotypes) to influence their social reasoning (e.g., political attitudes).

In addition, digital game literacy might include specific strategies such as establishing psychological distance to (violent, stereotypical) game events whenever game flow and task situation allow it. Self-regulated interruptions of the cognitive connection between player and game might reduce the accumulated impact of game content on automatic information processing. Media literacy education can thus approach players' post-game way to deal with game-induced cognitions (see above) and also provide techniques that limit the outreach of automatic game effects during game exposure. Such a process-oriented perspective on 'competent gaming' is in need of a solid theoretical and empirical research base (e.g., on the interplay of automatic and reflexive cognition, cf. Hofmann, Gschwendner, Nosek, & Schmitt &, 2005). Experiences from educational practice are also needed to elaborate on this issue of digital game literacy as well.

2. Coping with Social Affordances to play (again or longer)

An increasing portion of digital game play occurs as social activity that involves two or many more players, either co-located in front of the same gaming platform or connected via local or online networks (e.g., Jansz & Martens, 2003; Jansz & Tanis, 2007; Yee, 2006). Players become members of teams and collaborate on "bigger" challenges than they used to meet in single-player games. In persistent game worlds such as "World of Warcraft", players can participate in large-scale social systems with macro and meso structures such as guilds (Williams et al., 2006), intensive interplayer communication (e.g., Williams, Caplan & Xiong, 2007) and mutual dependence from other players: If a player cannot play at a given point in time (e.g., due to pressing homework tasks), this may affect large groups of other players waiting for the given player to complete the team or serve the group in a special way. In E-Sports (Wagner, 2006), that is, organized gaming tournaments and leagues, mutual dependence of team players may evoke similar social pressure to play (training sessions or tournament matches) as high level sports teams do. Moreover, with online game play, the number of people participating and the social bonds among players increase the frequency of occasions where 'playing would be fun' and the number of invitations to play (e.g., players participating in several parties in "World of Warcraft"). With the massive expansion of multiplayer gaming, then, the

number and quality of social affordances of digital games has [have] substantially increased (Klimmt & Hartmann, 2008).

From the perspective of digital game literacy, this development in digital gaming implies the definition of a new competence goal, that is, the ability to cope with the increased *social* affordances of gameplay. Conventional single-player games 'only' require from the competent gamer to handle intrinsic affordances of the game content, interface, and technology. The 'game itself' is the motivational factor that players have to focus when they regulate their interest and exposure time. In contrast, with multiplayer gaming, the other players involved represent a new dimension of affordance. These stakeholders and their more or less justified interest in or expectation of the individual player's engagement in playing adds to the affordance of the intrinsic entertainment appeal of the game itself. Consequently, a skilled, well-networked player whose engagement in gaming is valued by many other players may find good (social) reasons to virtually play all day long, which is currently debated as "game addiction" (Grüsser, Thalemann, & Griffiths, 2007; Salguero & Moran, 2002). Contemporary digital game literacy thus also means to keep some social autonomy and to resist social affordances so that other important activities such as school, work, family obligations, or alternative leisure time commitments can be preserved. Such autonomy, understood as an educational objective, needs to be developed concerning multiple qualities of social affordances, most importantly

- interpersonal affordances, that is, invitations to play from different real-life peers arriving at different times of the week and involving the given player in multiple sessions (one for each peer, for instance), which would result in excessive game play,

- group-level affordances (even team agreements or contracts) to play even when facing alternative obligations; such requirements arise from intensive participation in established player groups or teams (e.g., being a member of an ambitious clan preparing for a first-person-shooter tournament; being an important healer serving a guild in World of Warcraft).

Acknowledging the importance of strict self-enforcement of playing time rules seems to be an important issue in according game literacy education, since many players may not be aware of the social dynamics in multiplayer gaming that render their own repeated and/or continued participation in a game 'important' or even 'necessary'. Two motivational components seem to be relevant to gaming literacy in particular: (1) Positive social feedback from other players for one's own strong engagement in playing (which is interpreted as 'support for the team' or 'readiness to make sacrifices to help friends'), and (2) the process dynamics that create the impression of oneself as a player being irreplaceable for the group. These 'pull' and 'push' processes towards gaming may converge to a powerful motivational factor that 'enforces' continued, excessive game play and threatens self-regulation of game exposure as well as balanced engagement in all important domains of life. Reflection on these social-motivational dynamics that (can) drive the player into intensive-excessive game play would thus be an important step to regain autonomy about the decision when to play and how long to play. Consequently, one important and new goal for contemporary digital game literacy is to establish related problem awareness and self-regulatory capabilities especially in skilled, well-networked online game players.

3. Managing Inertia effects of Resources Invested in Playing

The fundamental principles of some modern genres of digital games require long-term involvement from players who want to enjoy their activity to the maximum extent. For instance, it takes substantial time and effort to "level up" a character in MMOs, which is necessary to explore new territories, acquire new items, pursue new quests, and collaborate with other players (Yee, 2006; Williams et al., 2006). In browser games such as "Travian" (www.travian.de; cf. Klimmt, Schmid, & Orthmann, in press), players need to invest time and effort to build up economic and military structures that can be used to prepare a large-scale attack or simply defend the own empire against hostile forces. In clan-based gaming, it frequently requires several hours per day of "training" to maintain one's acquired skill level and keep the ability to participate effectively in team battles. In other words, for these kinds of digital games, players need to invest considerable resources (time, thinking, physical effort such as sleep deprivation) in order to continue to have fun with the game.

These investments into the game may cause *inertia* effects on playing motivation: A player who has already spent extremely much time to level up his "World of Warcraft" character, for instance, has good reason to continue to play in order to find out what he can do now with his improved character. A player who has invested much strategic thinking and some 20 hours of play in the last two weeks to prepare a large-scale attack in a browser game is not likely to postpone or give up this attack, just because an unforeseen task has occurred in his office. While attentional inertia effects have been found in television research to prolong TV consumption time (e.g., Hawkins et al., 2002), some contemporary digital game genres thus can cause *motivational* inertia that challenge players' self-regulation, as there are more and more situations in which players have something relevant *to lose* if they stop playing or decide against playing.

Therefore, the ability to manage inertia effects of resources already invested in game play emerges as third important dimension of contemporary digital game literacy. Players need to be aware that with increasing involvement in the game, it may become harder to exit the game at a specific point in time (e.g., if a real-life task competes with the gaming motivation). The game may in fact demand continuation of play because so large investments (of time) have already been made and are in danger to be lost. Digital game literacy thus implies to be able to reflect on such inertia effects and remain autonomy over the decision whether to play or not to play. Players may also acquire specific strategies to prevent or reduce inertia effects, for instance, building clans or guilds with several individuals being able to fulfill a certain role (that is, reducing the risk of collective losses through one's own absence from gameplay), or by avoiding "high stakes" situations in browser games that put the efforts of a full year of game involvement at risk of being lost. More research on the frequency of such inertia effects, their motivational power (e.g., in "Power Gamers", cf. Taylor, 2003), and potential countermeasures is needed, because it is likely that more digital games of the future will find ways to make players invest time and resources that then transform into reasons for continued game play.

4. Conclusion and Outlook

Contemporary digital games have invented many new modes of enjoyment and enable player activities that are radically different from the traditional single-player mode of the early game generations. Media literacy concepts and education needs to consider these new developments in order to keep a vision of the 'competent gamer' and to develop effective strategies to help players to maximize the benefits of game play (enjoyment, recreation, personality development, learning, cf. Klimmt, 2008) and to minimize harmful effects. To achieve this goal, more research on the effects of digital games and the (more or less competent) ways of players to cope with them is needed. Some of this research should be done along the lines described in this chapter. It should take developmental processes (e.g., cognitive skills) as well as social-personal resources (e.g., social support from friends versus states of psychological crisis) into account, because both are likely to affect the level of competence a given player can reach concerning the literacy dimensions outlined here (see Slater, Henry, Swaim & Cardador, 2004).

In general, there is a need for a more systematic conceptualization of digital game literacy. Such a theoretical base is useful to define practical measures of media literacy diagnosis and educational strategies for literacy improvement. This paper is intended to stimulate the scientific debate on the requirements for contemporary digital game literacy and to provide some research-based fundamentals for a normative model of a 'competent gamer'.

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