Children's Electronic Gaming Content Preferences and Psychosocial Factors
Is there a Connection?

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Abstract

The gaming industry has dramatically increased the range of choices for different game genres and content. Despite this, research on psychosocial factors in children and electronic gaming has primarily focused on time spent on games rather than on content preferences. The present study goes beyond the traditional focus on electronic game frequency by investigating whether children's personal gaming content preferences are associated with psychosocial factors (self-concept, social competence and parental monitoring). This is accomplished by surveying 825 schoolchildren between ten and twelve years of age (5th, 6th and 7th grade) in Norway. A preference for violent games was moderately associated with low social acceptance among peers. Preference for pedagogical games was associated with high scholastic and athletic competence as well as perceived levels of parental monitoring. A preference for fantasy gaming was positively related to scholastic competence. Finally, preference for competitive games was strongly associated with experienced athletic competence.

Keywords: children, content preferences, electronic games, psychosocial factors, social acceptance, scholastic competence, athletic competence, social competence, parental monitoring

Introduction

One of the primary public and political issues today concerns the effect of exposure to electronic games on children (Carnagey et al. 2006), but there are many different games and gaming content available that may have different impacts upon the child. An important question is, therefore, whether some specific types of gaming content habits are harmful to or beneficial for children's psychosocial development. Thus far, on the issue of different electronic gaming content preferences among children has largely been ignored in the research (Wartella et al. 2002). This is interesting to note, as both the content choices of electronic games and the role of electronic games in the digital childhood have changed profoundly since the first games appeared on the market in the 1970s (Dill & Thill 2007). Over the past few decades, the gaming industry has dramatically increased the range of choices in gaming genres and content.

Furthermore, in the Western world, and in particular in the Nordic countries, the new playground is, to a greater extent than ever before, electronic games. Children's uses

of electronic games peak at around 12-13 years of age, when nearly all boys in Nordic countries play such games (Brandtzæg et al. 2004; Drotner 2001). The growing number of gaming children, in combination with a more individualized gaming content market, makes children's gaming content preferences an important research issue. The present article, therefore, investigates the association between psychosocial factors (self-concept, social competence and parental monitoring) and personal gaming content preferences in schoolchildren between ten and twelve years of age in Norway.

According to Roses (2005), children of today exercise an unparalleled degree of control over how they use their media. This has also been referred to as "The age of egocasting". "The age of egocasting" is also a reality in the new electronic gaming landscape, offering a vast array of new opportunities and choices for children in playing electronic games in many different ways, including excitement, aggression, fun, learning and communication. In the same way, different children choose among different types of clothes, music genres, and certain types of hobbies based on their personal preferences. To grasp the complexity of gaming activities, it may be useful to approach the type of game playing chosen as dependent upon children's personal game *content preferences*. Whether a child prefers sports games to violent games may also have different implications for his or her psychosocial development.

Most empirical research to date has focused mainly on the amount of time children spend on electronic gaming, rather than on their content preferences (Funk 2002; Wartella et al. 2002). An important exception is the focus on the possible impact of exposure to violent games (e.g., Anderson et al. 2003; Anderson et al. 2004; Carnagey et al. 2007). This research has found that playing violent games causes an increase in aggressive behaviour and a decrease in pro-social behaviour. A central limitation to this research is that violent games are not examined in comparison to other game content genres, only on the time spent on violent games. Moreover, this research approach has focused solely on possible negative influences on children (Wartella & Jennings 2000; Wartella et al. 2002; Salonius-Pasternak 2005). A one-sided focus on media violence, in turn, has overshadowed the potential for bad or good psychosocial effects of other content preferences in electronic gaming.

So far little systematic research has been conducted to either legitimize or dispute claims regarding the impact of interactive gaming content on children's psychosocial development (see Wartella et al. 2002). Consequently, little is known about how different types of gaming content preferences in children may affect children's social competence, interaction with family and friends, and their general self-concept (Salonius-Pasternak 2005; Subrahmayman et al. 2001). These psychosocial factors are key indicators of core attitudes, developmental factors, beliefs and coping abilities related to children's psychosocial factors (e.g., Harter 1985; Harter 1993; Jordan 2004; Krosnick et al. 2003; de Haan & Huysmans 2004; Heim et al. 2007).

The aim of the present study is to go beyond the traditional focus on the *time* or frequency of use children devote to gaming, and beyond the one-sided focus on violent content only. Instead, the study explores the relationship between *children's personal gaming content preferences* and psychosocial factors with regard to self-concept (children's own perceptions of social acceptance by their peers and of their own scholastic competence), parental monitoring (children's perception of parents' knowledge about their free time) and social competence.

The empirical investigative data are based on a survey performed in Norway in October and November 2002, which charted game content preference in 825 schoolchildren between ten and twelve years of age (5th, 6th and 7th grade). As Norway and the Nordic countries have a high coefficient of diffusion of new media technologies in comparison with many other Western countries, it is a particularly interesting location for research on this topic.

Gaming Content Preferences and Psychosocial Factors

As shown in the introduction, the new electronic gaming landscape is complex, and consists of a vast array of choices in different game content genres tailored towards a range of user profiles in regards to highly different interests and content preferences. As a consequence, there also appears to be large differences among children in preferences for game content (Gailey 1996; Bille et al. 2005; Brandtzæg et al. 2004).

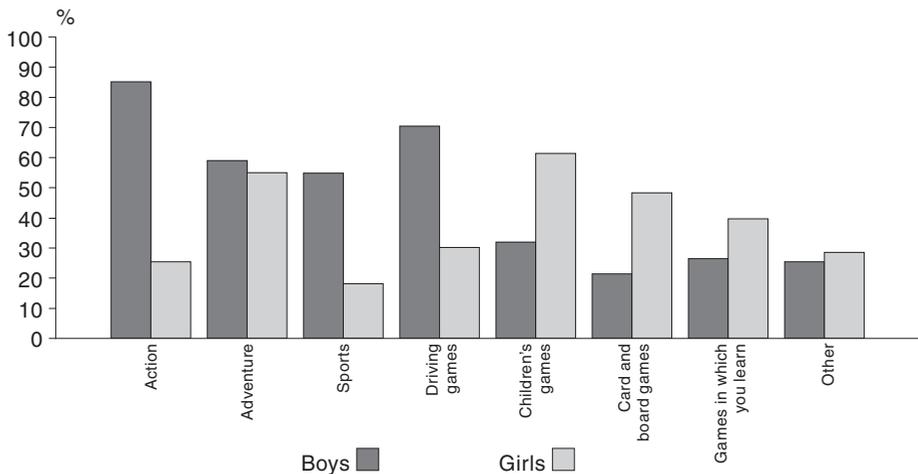***Figure 1.*** *Gaming Content Preferences among Danish Children 7-15 Year-old*

Figure 1 appears in a report by Bille et al. (2005) on "Cultural and leisure activities of the Danes" published by the Danish Ministry of Culture. The sample size is 1000 children, and the data were collected in 2004. The children were simply asked whether or not they were interested in a given genre.

Figure 2 shows data from the Norwegian study "En digital barndom?" (A digital Childhood?), which this article is also based upon (Brandtzæg et al. 2004). The total sample size is 1,112 children (but the graph only shows the 6th grader subset). The content types are constructs based on expressed content preferences in gaming. Both figures above document that children are quite diverse in their game content preferences. Furthermore, these figures confirm most common gender stereotypes regarding games habits, where boys enjoy action-related games, while girls are oriented towards games with utility and learning content.

However, regardless of personal content preferences, some findings suggest a link between electronic gaming and psychosocial factors, such as self-concept, social competence, pro-social behaviour, scholastic competence and parental monitoring.

Figure 2. *Gaming Content Preferences among Norwegian Children*
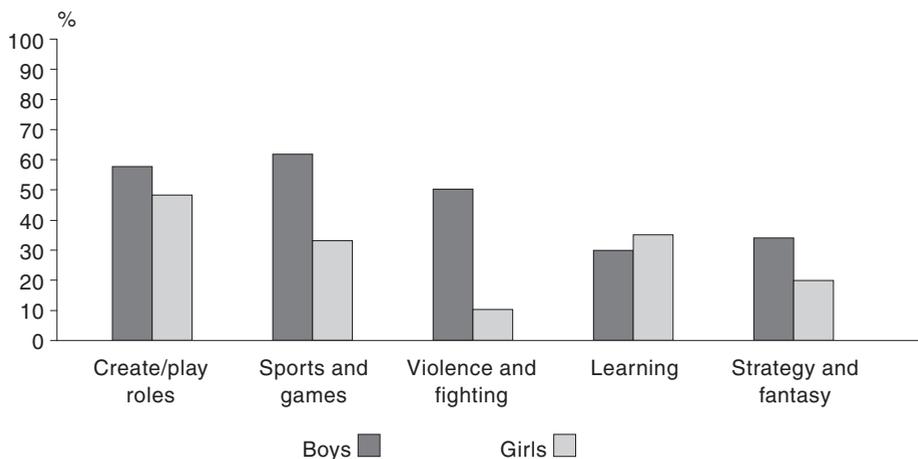
Self-concept

Heavy use of computer games among children is found to have negative outcomes in terms of self-esteem and sociability (Roe & Muijs 1998). Funk and Buchman (1996) also indicated that more time spent playing video games was associated with lower self-concept scores, but just among girls. Uhlmann and Swanson (2004) suggested that playing violent video games can lead to the automatic learning of aggressive self-views. Another study demonstrated that implicit self-esteem can be increased using a computer game that repeatedly pairs self-relevant information with smiling faces. These findings are consistent with the principles of classical conditioning (Jodene et al. 2004)

Social Competence and Pro-social Behaviour

A study by Funk et al. (2000) found that fifth graders' preferences for violent games were associated with lower self-perceived behavioural conduct or social competence. Further, according to Anderson et al. (2003), using such games often results in a low level of pro-social behaviour, increases in physiological arousal and aggressive thoughts and feelings, and more aggressive social behaviour.

However, some studies, related to more positive aspects, find that electronic games are a social medium. Rutowska and Carlton (1994) found that there was no difference in sociability between high- and low-frequency players, and noted that games foster friendships, while Colwell et al. (1995) found that heavy players were more likely to engage in social interactions with their friends after school.

Findings challenging the notion that heavy computer users experience social isolation are also provided by Orleans and Laney (2000). Video-games have also been suggested as promoting co-operative behaviour and reinforcement in more educational settings (Salomon & Gardner 1986; Griffiths 1997b). For example, home education games are said to encourage pro-social behaviour, because of the cooperation and sharing among the players (see Subrahmanyam et al. 2001). Two research reports (Becta 2001; Kirriemuir & McFarlane 2004) have also recognized that strategy games stimulate discussion by providing authentic contexts for collaboration between classmates.

Scholastic Competence and Parental Monitoring

Another study found that adolescents who expose themselves to larger amounts of game violence performed more poorly in school (Gentile et al. 2004). One moderator of the effects of game violence, however, seems to be parental monitoring (Bickham et al. 2003; Strasburger & Wilson 2002).

Thus, gaming activity may be an educational tool for learning (e.g., Fontana & Beckerman 2004; Becta 2001; Kirriemuir & McFarlane 2004) that makes formal learning more pleasurable, motivating and effective (e.g., Mitchell & Savill-Smith 2004).

Contradictory Results

Although these studies provide some knowledge of heavy users and users of more violent games, their results are still more or less contradictory. Analysts disagree as to whether this new gaming culture is a positive or a negative influence in regards to psychosocial factors. Furthermore, there is very little research on how different game content preferences in children actually affect children's psychosocial traits.

Method

Research Question and Approach

The present study explores the relationship between children's (aged 10 to 12 years) gaming content preferences and psychosocial factors. As a consequence of contradictory findings in previous research, and a lack of systematic research on children's gaming content preferences in general, we have adopted an exploratory approach. The emphasis here is, therefore, on establishing empirical relationships rather than on testing an *a priori* hypothesis on casual relationships between gaming content preferences and psychosocial factors. The need for an explorative approach to complex issues has also been pointed out by de Haan and Huysmans (2004) and Schott and Selwyn (2000). As the previous section pointed out, there may be both positive and negative relationships between personal content preferences for gaming and psychosocial factors in children.

This study poses the following general research question:

> *What is the association between personal content preferences in gaming and psychosocial factors in children between the ages of 10 and 12?*

Of more particular interest, we examine the importance of having a preference for different kinds of game content (e.g. violent games, competition games, fantasy games, etc.) in relation to psychosocial factors defined as social competence, self-concept (athletic, scholastic, social acceptance) and the child's subjective experience of parental monitoring. These psychosocial factors have been chosen because they have previously been investigated regarding time spent with the games, as pointed out in the previous section. More specifically, we want to see this related to the following factors and theoretical constructs:

- *Social competence* is conceptualized as skilful social behaviour, which links to the construct of self-efficacy (Bandura 1997). This is understood in terms of the theory and assessment scale developed by Wheeler and Ladd (1982), and it is used in this study. The scale, "children's self-efficacy for social interaction with peers", assesses how children perceive their own effectiveness in social interactions with peers.

- *Self-concept* refers to how individual children judge their own competence in more general domains of life such as scholastic competence (assessing how well children believe they are performing at school, and how quickly they can complete their work), social acceptance (assessing how popular children feel themselves to be, and if they believe that they have a lot of friends) and athletic competence (assessing children's perception of their own athletic ability). This is explained using the more general theory of self-concept developed and measured by Harter's (1985) Self-Perception Profile.

- *Parental monitoring* refers to children's perceptions of their parents' awareness of where and with whom they are spending their time when they are not at home or attending school (Alsaker et al. 1991). This is, therefore, an important psychosocial dimension related to children's experience of the family environment, differing from Harter's "social acceptance", which relates to popularity among friends.

Sample

The data analysed had been collected by the Norwegian research project "A digital childhood" – www.sintef.no/digitalbarndom – (2002-2004). A questionnaire survey charted access to and usage of game technology, as well as the content preferences and perception of psychosocial factors of schoolchildren between ten and twelve years of age (5th, 6th and 7th grade). The study took place in October and November 2002 in Norway.

A total of 825 children from six schools in Oslo completed the questionnaire form. The sample was stratified according to geographical and socioeconomic conditions in the city. Fifty-one percent of the sample was boys, and forty-nine percent girls. Nineteen percent of the sample had a father from a country other than Norway (Europe = 6%, Africa = 3%, Asia = 9%, America = 1%). There was approximately the same number of children in all age groups. The response rate was 90%.

The questionnaire was piloted with 38 children of the same age before use, and some modifications were made as a consequence of the pilot study.

Data Collection

At each school a teacher was appointed as "liaison officer", serving as the research team's link to the pupils, school and parents. The research team had already given this person information and details about the procedures. Every pupil gave his or her consent in writing on the basis of oral and written descriptions of the project, formulated according to the standards prescribed by the Norwegian Data Inspectorate (NSD). In accordance with these norms, written informed consent was also obtained from parents. The teacher monitored the pupils in the classrooms, in accordance with a carefully defined standard procedure, during completion of the form. In each case, children were first told about the meanings of the individual scales in the questionnaire. All pupils completed the form at the same time in order to prevent them from influencing each other. Content preferences in gaming and psychosocial factors such as parental monitoring, social competence, self-concept and its measures are described below.

Content Preferences for Electronic Games

We developed an instrument to measure content preferences for games technologies. This was done in group interviews by asking 40 children in 5th and 7th grade about what kind of electronic games they were aware of, what kind of game content they preferred, and what they enjoyed about such games. After analysing this material, we ended up with 18 different content preferences used in the questionnaire (see categories in Table 2). .

Self-perception Profile

In order to measure children's self-concept or self-perception of social acceptance, scholastic competence, and athletic competence, we used three sub-scales from Harter's Self-Perception Profile for Adolescents (Harter 1985), carefully modified for the Norwegian language (Wichstrøm 1995). We used the profile for adolescents and not the "children profile", because the adolescents' profile scale may be more suitable for children of this age (10-12 years) who are just about to leave childhood and enter the adolescent stage. Each statement was presented as a self-description: for example, "I have difficulties in making friends", "Children of my age have difficulties liking me" and "I am popular with others". The sub-scales of scholastic competence and athletic competence were shortened from five to two statements in order to make the questionnaire more manageable for children of this age. We chose the statements with best reliability according to the "Young in Norway" study (Rossow & Bø 2002; Torgersen 2004). We used a total of ten statements taken from Harter's Self-Perception Profile. Like the original version, the scale had four options: 1) "Describes me very poorly", 2) "Describes me quite poorly", 3) "Describes me quite well", and 4) "Describes me very well", which were coded as 1, 2, 3 and 4.

Social Competence – Children's Self-Efficacy for Peer Interaction Scale

We measured social competence with a short version of "The Children's Self-Efficacy for Peer Interaction Scale" (CSPI) (Wheeler & Ladd 1982). The reason for shortening this version was to make the questionnaire appropriate for the youngest children in our investigation. It was shortened on the basis of a Cronbach's alpha test on a representative sample of 972 pupils aged ten (Torgersen 2004). With this instrument, children have to state their opinions on "how easy, or difficult, you think that it is to do the following" (1: very difficult, 2: fairly difficult, 3: fairly easy and 4: very easy) in relation to 12 statements (originally 22) such as: "Some kids want to play a game. Asking them if you can play is for you …" This instrument has also been carefully translated into Norwegian, and has been used in previous studies in Norway (see Heim et al. 2007).

Parental Monitoring

We measured "parental monitoring" by means of children's reported experience of their parents' control and knowledge of their leisure time in regards to two items, which were to be rated as "Suits Perfectly" = 1, "Suits pretty well" = 2; "Suits approximately" = 3; "Suits pretty badly" = 4 and "Doesn't suit at all" = 5 (Alsaker et al. 1991).

Two-step Analysis

The study was designed to investigate children's content preferences in gaming. In order to determine whether content preferences in gaming and psychosocial factors are associated, the analysis was performed in *two steps*:

The first was a data-reduction step, in which content preference factors were analysed separately. Psychosocial factors have been analysed in another article by Heim et al. (2007). The resulting factors of this analysis fitted quite well with the original sub-scales with respect to parental monitoring, the self-perception profile and social competence. This analysis revealed seven psychosocial factors:

1. **Social competence:** contained eight items, all of which were concerned with the child's own belief in his ability to perform skilful social behaviour. All the items are derived from Wheeler and Ladd (1982).

2. **Scholastic competence**: contained three items, all of which were related to aspects of Harter's scholastic competence scale. In addition we added one item: (I enjoy reading).

3. **Athletic competence**: also comprised three items. Two of them were related to the sub-scale of athletic competence (Harter 1985) and one to the sub-scale of social acceptance, bearing in mind that being good at sports is often associated with popularity among children (Chase & Dummer 1992).

4. **Loyalty to friends:** included four items stressing the importance of taking care of friends and of having friends.

5. **Social acceptance**: consists of two items from the sub-scale of social acceptance (Harter 1985) and stresses the difficulties of gaining social acceptance among other children.

6. **Parental monitoring**: includes two variables regarding children's experience of parental control and is referred to as "parental monitoring".

7. **Social competence – conflict**: comprises six items (five from Wheeler & Ladd (1982)). See analysis in Heim et al. (2007).

The second step in the analysis was a multiple regression, in which the factor scores were correlated. The psychosocial factors were regarded as dependent variables and the content preferences in gaming and control variables were regarded as independent variables. Variables were transformed in line with the general guidelines given by Tabachnick and Fidell (2001). The general purpose of the multiple regressions was to learn more about the relationship between several independent or predictor variables, and a dependent variable game (psychosocial factor). The sub-command/METHOD ENTER in the REGRESSION procedure for SPSS forced all of the explanatory variables into the regression equation in one step. All statistics were computed using SPSS 11.

Results

Analysis Step 1: Data Reduction

A factor analysis of gaming content preferences was performed in order to reduce a large number of variables to a smaller number of factors, which allowed modelling of some typical content preferences among children. This was not done for the psycho-social variables, as these scales have already been validated in a previous study (Heim et al. 2007).

All the variables regarding questions of preference for game content were entered into a factor analysis. All answers indicating "Have not tried" were treated as missing data. All variables ranged from 2 to 4.

Table 1.   *Descriptive Statistics of Preferences for Game Content*

	N	Mean	Std. Deviation
..compete with others	611	2.62	0.61
..to plan new things	505	2.84	0.65
..be in a fantasy/ fairy-tale world	590	2.83	0.73
..drive fast with cars	717	2.63	0.71
..knock and kick and competitors	628	2.93	0.83
..solve tasks	738	2.87	0.71
..conquer over others	747	2.37	0.56
..learn about animals, nature and other countries	722	3.09	0.76
..kill opponents	593	2.98	0.82
..play football/sport	707	2.61	0.76
..make new worlds	556	2.61	0.67
..play different roles/persons	630	2.60	0.66
..shoot with weapons	614	2.91	0.81
..war	618	2.94	0.84
..doing music	676	2.63	0.70
..make and build new cities	690	2.61	0.72
..learn a lot about new things	744	2.71	0.69
..hunt others	612	2.92	0.80

The factor analysis employed the direct oblimin rotation (delta = 0). Five factors had eigenvalues > 1. Four and five factors were rotated, observing the simple structure, interpretability and factor fission of the solutions. A 4-factor solution was chosen that accounted for 53 percent of the variance. The "Means" option was used to handle missing data, and the "Regression" method was used to calculate factor scores. N = 825 in this analysis.

Table 2. *Pattern Matrix: Preferences for Game Content*

Preferences	Components			
	1	2	3	4
..shoot someone with weapons	0.899			
..kill opponents	0.896			
..make war	0.802			
..hit and kick opponents	0.799			
..hunt others	0.681			
..learn about animals, nature and other countries		0.788		
..learn about a lot of things		0.780		
..solve tasks		0.678		
..doing music		0.385		
..role playing, playing other people			-0.694	
..be in a fairy-tale world or a fantasy world			-0.686	
..make new worlds			-0.625	
..plan new things			-0.520	0.323
..make and build cities			-0.460	
..competition with others				0.721
..play football/sport			0.346	0.592
..drive fast with cars				0.590
..win against others				0.509

Note: Factor loadings less than 0.30 are not printed.

Table 3. *Correlation between Game Content Preference Factors*

Components	1	2	3
2	0.03		
3	-0.14	-0.27	
4	0.34	0.18	-0.17

In Table 3, note that the polarity of Factor 3 is negative, so that all factor correlations are "positive"; a high preference for one kind of game correlated with a high preference for another kind. For the remaining analysis, Factor 3 was reflected, so that a high preference corresponded to a high factor score.

The interpretation appeared to be fairly straightforward:

1. Factor 1 was characterized by preference for violent games, and was labelled "Violent games".
2. Factor 2 was labelled "Pedagogical games", as the games mentioned had to do with learning something or solving tasks.
3. Factor 3 was labelled "Fantasy games", as these games referred to inhabiting a fantasy world, playing roles, or making new worlds.
4. The last factor, Factor 4, was labelled "Competition games", as games in which one could compete with others or play win-or-lose games had a high loading on this factor.

Analysis Step 2: Multiple Regression Analysis

Previous research (Heim et al. 2007) has shown that gender, grade, ethnicity and organized activities were correlated both with psychosocial factors and technology usage; these findings were based on the same sample as that used here. Therefore, the above variables were entered as controls variables.

Only subjects with valid data on all variables participated in the analysis, a total of 552 (N). The regression method was "Stepwise", with p for inclusion at <0.05 and p for exclusion at <0.10. The tolerance of the excluded variables were, in general, high, and the lowest was "Violent games" with the dependent variable "Scholastic Competence" = 0.736; the rest were all higher than 0.800.

The psychosocial factors were transformed so that the residuals after the regression analysis would not deviate from a normal distribution. This turned out reasonably well, except that residuals from the analysis in which "Social Competence" was the dependent variable were somewhat skewed (Skew = -0.21 SE= 0.10); "Scholastic Competence" and "Parental Monitoring" deviated with respect to kurtosis (Kurtosis = 0.77 and -1.06 respectively, SE = 0.21). Transformations were as follows, with the polarity of the resulting variable always remaining the same as the original.

- Social Competence = -SQRT (3-Social Competence)

- Scholastic Competence = -lg10 (3.5-Scholastic Competence)

- Athletic Competence= -SQRT (3.5-Athletic Competence)

- Loyalty to Friends = lg10 (10+Loyalty to Friends)

- Low Social Acceptance = lg10 (3+Low Social Acceptance)

- Parental Monitoring = 1/ (2.5-Parental Monitoring)

- Social Competence – Conflict = -lg10 (3-Social Competence – Conflict)

Table 4. *Standardized Regression Coefficients for the Seven Psychosocial Factors*

Independent: Game preferences and control variables	Dependent: Psychosocial factors						
	Social competence	Scholastic competence	Athletic competence	Loyalty to friends	Low social acceptance	Parental monitoring	Social competence – conflict
Gender		0.10*			-0.10*		-0.17***
Grade		0.10*		0.10*			0.10*
Ethnicity	-0.14***				0.16***		
Organized activities	0.14**		0.15***		-0.16***		
Violent games					-0.09*		
Pedagogical games		-0.14**	-0.09*			-0.22***	
Fantasy games		-0.12**	0.13**	-0.09*			
Competition games		0.10*	-0.23***				
ANOVA F	10.67***	9.04***	15.01***	4.75**	13.16***	2.,87***	10.80***
Adjusted R Square	0.051	0.055	0.092	0.013	0,081	0.045	0,034
Durbin-Watson	1.97	2.03	1.87	1.83	1,94	1.97	1,99

Statistical significance: * p < 0.05, ** p < 0.01, *** p < 0.001

Applying the Bonferroni principle to the set of 56 possible coefficients in Table 4, only those marked *** should be regarded as significant at the 0.05 level. However, 20 "significant" coefficients in the table are much more that the (56*0.05) 2.8 that should have been expected based on pure chance. Furthermore, the relationships between the set of dependent and independent variables were usually small, but highly significant. All the psychosocial factor scores were significantly accounted for by the independent variables; however, the amount of variance accounted for was rather low, ranging from about 4 to around 9 percent.

Furthermore, all four control variables contributed to the prediction of the psychosocial factors. Ethnicity is a powerful predictor that is strongly associated with "Low Social Competence" and "Low Social Acceptance". "Organized Activity after School" correlated positively with "Social Competence", "Athletic Competence" and negatively with "Low Social Acceptance" (i.e. all associations had the same polarity with regard to what can be seen as the "preferred" direction).

All game-preference factors contributed independently to the psychosocial factors. A preference for "Violent Games" is only associated with "Low Social Acceptance" and only to a moderate degree. A preference for "Pedagogical Games" is associated with "Scholastic" and "Athletic Competence" and "Parental Monitoring". A preference for "Fantasy Games" is positively related to "Scholastic Competence" and negatively to "Athletic Competence". A preference for "Competition Games" is strongly associated with "Athletic Competence".

Discussion

The central topic of the present investigation is whether knowledge of content preferences in electronic gaming can predict self-reported psychosocial factors among children. It must be stressed, however, that because the design of the study is not longitudinal, causal relationships cannot be proved. However, this should not keep us from discussing possible causal relationships.

Although age, gender, ethnicity and leisure activities also correlate with content preferences, our results show that the content preferences for gaming factors independently contributed to: 1) scholastic competence, 2) athletic competence, 3) low social acceptance and 4) parental monitoring.

Social Competence

As Table 4 shows, "Grade", "Ethnicity" and "Organized Activity After School" were all related to the social competence factor; however, none of the game preference factors were related to social competence. This was also suggested by Heim et al., who did not find any relationship between children's total media usage and social competence. This might indicate that games and media usage, in total, do not influence the level of social competence in any direction.

Scholastic Competence

Both a preference for "Pedagogical Games" and for "Fantasy Games" were related to this factor, though none of the control variables were. Although "Pedagogical Games" and

"Fantasy Games" were correlated, they both contributed independently to "Scholastic Competence". The most likely interpretation of these relationships is that some children are more engaged in intellectual and creative activities, which will be reflected both in their game preferences and in their interest in schoolwork.

Athletic Competence

"Organized Activity After School" and a preference for "Pedagogical games" and "Competition games" were associated with this factor. A preference for "Fantasy games" was negatively associated with it. This can be interpreted as a general interest in competitive activities. "Organized Activity After School" usually involves participation in some kind of sports. Both preference for "Pedagogical games" and, even more so, for "Competition games" represent a challenge with regard to "being best", while "Fantasy games" do not have this attribute.

Loyalty to Friends

The factor "Loyalty to Friends" was only associated with grade, and not with game preferences. Types of content preferences are, therefore, not found to be an influence on children's loyalty to each other, in terms of the importance of taking care of friends and of having friends. This, however, may challenge the notion that preferences for violence content are often associated with aggression and violence against peers (e.g., Anderson et al. 2004). Social competence-conflict did not have any correlation with this factor either (see social competence-conflict).

Low Social Acceptance

The psychosocial factor "Low Social Acceptance" was associated with "Gender" and "Ethnicity" and inversely associated with "Organized Activity After School". This means that children with non-Norwegian parents, and children with few regular activities after school, mainly boys, tend to feel that they are not accepted among their peers. The findings, therefore, support the notion that gamers with social difficulties turn to game worlds to cope with or escape from these problems.

There was also a tendency for a preference for "Violent Games" to be associated with low social acceptance. This is in line with a study by Funk et al. (2000), who found that a stronger preference for violent games was associated with lower Harter scale self-perceptions of behavioural conduct for both boys and girls. It is noteworthy that only negative relationships between game-playing habits and aspects of self-concept were identified in this study. Another study by Heim et al. (2007) showed that "Low Social Acceptance" was associated with rather heavy usage of media technology. One tentative interpretation is that children who experience little social acceptance will seek arenas in which they are less dependent on social acceptance, such as gaming and Internet surfing, and that possible frustration over lack of social support may be vented through playing violent games. Another possible explanation is that peers may dislike these children's violent content preferences, so that gamers may then experience lower social acceptance.

Finally, according to Funk et al. (2002), parents have reported that children display more negative behaviours after playing violent electronic games, particularly after a

long period of play. It therefore seems likely that increased irritability and negative behaviour in gamers who prefer violent games, in general, will also influence their acceptance among peers.

Parental Monitoring

"Parental Monitoring" was associated with a preference for "Pedagogical games". It is reasonable to assume that parents' interest in and monitoring of their children's media usage will foster a preference for what parents prefer their children to use: pedagogical games. This corresponds with previous research on TV viewing, which has stressed the importance of parents' involvement, and their critical attitude towards watching TV, as a means of obtaining the positive effects of watching TV on learning and education (e.g., Valerio et al. 1997). Wartella et al. (2000) claimed that if parents are available to their children, and are involved in their learning activities, the children will be more likely to utilize the computer and the Internet for creative, educational purposes, rather than primarily for gaming or television viewing. Heim et al. (2007) also found a significant correlation between parental monitoring and "Utility use" or use such as "looking for information on the Internet for school work" and "doing school work on the computer". Other studies have also suggested that parental monitoring of children's media use is an important moderating factor with regard to other media, such as television. Restrictions on the amount of time, co-viewing, and discussion of television content have been shown to have beneficial effects (e.g., Strasbourg & Wilson 2002). Active parental involvement, such as rules limiting media use, and active mediation (both positive encouragement to watch "positive" media and discouragement of "negative" messages) are said to be effective in influencing children's understanding of and reactions to programme content (Dorr & Rabin 1995).

These findings are in accordance with our results. We therefore believe that when parents are actively involved in their child's everyday activities, the child will be more likely to embrace the technology for creative, educational purposes.

Social Competence – Conflict

Older boys tend to score high on this factor, but we did not identify any relationship between this psychosocial factor of "Social Competence-Conflict" and gaming content preferences. This lack of correlation may conflict with previous studies suggesting that playing aggressive electronic games has an impact on children's pro-social behaviour, e.g. that it makes them less willing to donate money or to help other people. However, there has been very little research on this issue (see Subrahmanyam et al. 2000).

Summary and Conclusions

The present study has taken an explorative approach to the question of whether a child's gaming content preference is associated with different psychosocial factors. Our findings demonstrate that one cannot simply look at gaming activity in terms of frequency of use; it is also important to understand children's content preferences in electronic gaming in relation to psychosocial factors. This is particularly important, as gaming features and content have evolved greatly over the past few decades (e.g., Dill & Thill, 2007). The

present results indicate that different content preferences in electronic gaming are related to different psychosocial factors. An important outcome was that some of the content preferences in gaming are also associated with positive aspects of psychosocial factors. The correlations are relatively low, but they are significant. Although age, gender, ethnicity and leisure activities are correlated with psychosocial factors, preferences for certain types of electronic game content make significant and independent contributions to statistical prediction of the following four psychosocial factors:

- Scholastic competence

- Athletic competence

- Low social acceptance

- Parental monitoring.

There was no correlation with social competence-conflict or loyalty to friends.

A preference for violent games is moderately associated with low social acceptance among peers. There may be several different explanations for this, such as low social acceptance of violence in general, or that children who use this kind of content may push other children away because they become irritable and aggressive after interacting with violent content. Previous research suggests that children with a preference for violent games are rated as more aggressive by their peers (see Subrahmanyam, 2001). Playing violent video games is also said to increase aggressive behaviour and decrease pro-social behaviour (e.g., Anderson et al., 2004). However, the causal relationship could also be the reverse, i.e. that children with preferences for this kind of content may have low social acceptance in the first place, and use violent types of gaming as an escape from their reality.

A preference for pedagogical games is associated with both high scholastic and athletic competence, as well as parental monitoring. A preference for fantasy gaming is positively related to scholastic competence, while preferences for competition games are strongly associated with athletic competence. The effect of parental monitoring is explained by the idea that parents are guiding their children towards positive media use. Previous research also suggests that a high score on the "scholastic competence" factor is related to less TV or entertainment use (see Heim et al., 2007). The relationships between fantasy gaming and pedagogical games and scholastic competence may be understood in terms of the intellectual stimulation this type of content can provide children. The explanation for the correlation between competitive games and athletic competence may be that children with athletic competence struggle to be best, not just in sports, but also in games in general. Or again, it could be the other way around; perhaps children who play such games are more competitive than other children.

However, because this study is not longitudinal, but rather is based on a cross-sectional analysis, it cannot demonstrate any causal relationships between psychosocial factors and content preferences. On the other hand, the significant correlations indicate the possibility of both positive and negative causal relationships, which may have implications for children's psychosocial well-being and psychosocial development and which need to be investigated further. In other words, game-playing that involves certain types of content may have a potential for positive influence in terms of a better self-concept in relation to scholastic competence and athletic competence. It is vital that this potential

be realized, as game playing is a growing activity among children from an early age in the Nordic countries. ICT and gaming are also an increasing part of children's school routines. It should also be feasible to use, for instance, pedagogical games in the school context to improve learning among children.

However, the lack of cross-national samples limits the generalizability of the present findings. Depite these methodical limitations, however, the results are of interest, as electronic gaming has been more rapidly and widely adopted by Norwegian children than by children in most other countries.

Future research should include content preferences and adopt a longitudinal design, as well as in-depth interviews, behavioural observations and information from other sources, such as parents and teachers, to develop a more comprehensible overview of this complex topic. For example, one limitation of our study is that measuring content preferences may force children to respond in a socially desirable way and to give culturally accepted answers. We were not able to check if the children's expressed personal content preference actually matched their real content usage. Both in-depth interviews and observations could give more insight into how children react to, and actually experience, different types of electronic game content. The focus on content preferences in gaming should also include media content preferences in general, and content created by, and shared among children themselves (user-generated content), particularly as younger users are set to be the largest group of both content producers and content consumers in the future (Heim & Brandtzæg, 2007). And as Cassell puts it: "(…) it is the content of the medium – the message – that must be evaluated (...)" (2002, p. 123).

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