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THE LEISURE ACTIVITIES OF FIFTH GRADE PUPILS AND THEIR RELATIONSHIPS TO PUPILS' READING ACHIEVEMENTS

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The leisure activities of Irish fifth grade pupils are examined and linked to their achievements on a measure of three domains of reading literacy (Narrative, Expository, and Documents). Three-quarters of pupils read books at least once or twice a week, and about two-thirds read newspapers/magazines/comics with the same frequency. Seven in 10 pupils watched TV/video at least one hour each school day; at weekends more than 8 in 10 did. Fewer pupils (18%) played computer games during the week, but the number doubled at weekends. Leisure reading correlates positively with reading performance and negatively with computer game playing and TV/video watching. Gender differences in leisure activities are evident, with boys spending more time watching TV/videos and playing computer games, and girls spending more time reading.

The ability to read is one of the most important acquisitions of students in their early school years. It has many benefits, both at the individual/ developmental level and at the societal/economic level. Anything that might interfere with its development would be a cause for concern. It is not surprising then that the rapid expansion and development of media and computer technology, and their wide availability for entertainment purposes, has caused commentators to consider their possible effects on, among other things, children's reading behaviour and reading performance (Huston & Wright, 1998). The popularity of computer games is not surprising given the prominent place TV and videos had in Western culture prior to their introduction. They have a number of specific and potentially positive features. They appeal to colour, motion, and depth perception; they require spatial-temporal comprehension skills; they are interactive and highly flexible and demand

comprehension of strategy and interactions of multiple variables, as well as good hand-eye co-ordination and, in some instances, quick reaction time (Greenfield, 1984). But because of their strong emphasis on non-textual images and movement, it has been argued that their use may be linked to a decline in reading performance and leisure reading.

Research findings point to a small but positive association between amounts of leisure reading and reading achievement. For example, Greaney (1980) reported a correlation of .31 between time devoted to book reading and reading achievement for a sample of Irish fifth grade students. When different types of reading were examined, as in the 1991 Reading Literacy Study (Elley, 1992, 1994), the strength of the relationship was found to vary according to type of text. Correlations tended to be higher for Narrative and Expository (continuous text) reading scores than for Documents (non-continuous text) scores. An area of concern relating to leisure reading is the clear gender differences in this activity: girls read more. Further, girls read more books (Greaney, 1980; Greaney & Hegarty, 1987), while boys read more non-fiction (Elley, 1994; Greaney, 1980).

A decline in leisure time reading has been associated with increased time spent watching TV (Glen, 1994; Nagy, 1997) which in turn has been associated with lowered reading skills (Comstock, 1994; Neuman, 1988; Richie, Price & Roberts, 1987).

Two explanations for the supposed effects of TV viewing on children's cognitive development and performance have been advanced (Huston & Wright, 1998). According to the first ("time-displacement"), TV takes time from more productive activities and reduces the amount of social interaction in families and other social groups. As a result, children's opportunities for educational experiences are reduced. According to the second explanation ("nature and content"), the nature of the medium encourages a short attention span and shallower cognitive processing and, as a result, creates difficulty in maintaining concentration on a more active task such as independent reading.

The time children spend playing computer games has also increased steadily in recent years (Buchman & Funk, 1995). By the 1990s, home computer game equipment and use had become common in several countries (Greenfield et al., 1994; Phillips, Rolls, Rouse, & Griffiths, 1995; Wiegman & van Schie, 1998). As in the case of reading and TV viewing, sex differences have been observed in the playing of computer games, with more boys than girls at the heaviest level (Funk, Germann, & Buchman, 1997; Keller, 1992; Phillips et al., 1995; Wiegman & van Schie, 1998). There have been relatively few studies of the relationship between use of computer games and children's scholastic

achievements. Conclusions are often extrapolated from earlier studies of TV viewing, or based on first generation computer and arcade games (Phillips et al., 1995). With the extremely rapid development of computer graphics and increased sophistication of the software, one cannot assume that the findings of earlier studies are relevant. Some researchers have highlighted possible cognitive benefits of computer games such as enhancement of spatial skills or parallel processing (Greenfield, Brannon, & Lohr, 1994; Greenfield, de Winstanley, Kilpatrick, & Kaye, 1994). However, Funk et al. (1997) argue that some studies have failed to show a causal relationship between the length of time a person has spent playing electronic games and improvements in hand-eye co-ordination, and that improvements in spatial skills may only apply to those weakest in the skills. They also express doubt at the generalizability of the skills. Keller (1992) argued that playing computer games increases critical thinking skills and, although the trend of results in her sample of 14- to 18-year olds supported this position, the difference between players and non-players on a critical thinking test was not significant. While small negative relationships between academic performance and time spent playing computer games have been found, further clarification regarding their nature is needed (see Funk et al., 1997).

The study reported in this paper addresses some of these issues. It presents data from a national sample of fifth grade pupils in Irish national schools on the frequency with which pupils watch TV/videos, play computer games, and read in their leisure time, and the relationship between these activities and pupils' achievement on a test of reading.

METHOD

Participants

The defined target population included 96.8% of all pupils in fifth grade in the country. A two-stage stratified cluster design was used to select a representative sample of these pupils (see Cosgrove, Kellaghan, Forde, & Morgan, 2000). The participation rate at the school level was 100% (all 150 selected schools participated), and in excess of 93% at the pupil level (almost 4,000 students took part). The mean age of pupils was 11 years and 5 months (range = 3 years and 11 months). The mean age of boys was 11 years and 6 months and of girls 11 years and 4 months.

Instruments

Tasks for the Assessment of Reading Achievement (TARA). The assessment instrument was designed for use in national surveys of reading using a modular approach to administration (Martin, Forde, & Hickey, 1991). It focuses on three

domains of reading achievement corresponding to those used in international surveys: *Narrative prose* (continuous text in which the writer's main aim is to tell a story); *Expository prose* (continuous text designed to describe, explain, or otherwise convey factual information or opinion to the reader; texts may be accompanied by illustrations); and *Documents* (structured information presented in the form of charts, tables, maps, lists or sets of instructions and including reference material such as dictionary and index pages). Individual scores were scaled using a 3-parameter Item Response Theory model (see Mislevy & Bock, 1990), with a mean of 250 and a standard deviation of 50 for the three scales combined (total) and for each domain.

Pupil Questionnaire. A questionnaire consisting of 29 items in a multiple-choice format was completed by each pupil. The questionnaire sought information among other things on the frequency and types of pupils' leisure reading and the amount of time pupils spent watching TV and videos and playing computer games.

Procedure

The study was carried out in the last two weeks of May 1998. The reading achievement test is not strictly timed, but each of its two sections takes approximately 40 minutes to complete. There is a short break between sections. The Pupil Questionnaire requires about 20 minutes to complete. Pupils worked on their own on TARA; however, each item on the Questionnaire was read aloud by the test administrator.

RESULTS

Leisure Reading

Three-quarters of pupils (74.32%) said that they read books frequently (nearly every day, or once or twice a week). While newspapers and magazines or comics were read somewhat less frequently, about two-thirds of pupils said that they read these at least once a week (Table 1). A minority of between 6.32 and 12.94% (depending on the type of leisure reading involved) said they never, or hardly ever, did such reading.

Boys and girls differed in what they read. More than half (53.85%) of girls, compared to a third (33.95%) of boys, read books nearly every day; furthermore, girls tended to read magazines or comics slightly more often than boys. In contrast, 27.27% of boys, but only 18.37% of girls, read newspapers nearly every day (Table 2). Gender was significantly associated with frequency of book-reading (χ^2=208.04; *df*=4; p<.001), newspaper-reading (χ^2=52.98; *df*=4; p<.001), and reading comics or magazines (χ^2=102.53; *df*=4; p>.001).

TABLE 1

NUMBERS AND PERCENTAGES OF STUDENTS INDICATING FREQUENCIES OF VARIOUS TYPES OF LEISURE READING

Type of leisure Reading		Nearly every day	1-2 times a week	Few times a month	Few times a year	Hardly ever/never	Total N
Book	n	1,695	1,178	543	170	285	3,871
	%	43.79	30.43	14.03	4.39	7.36	
Newspaper	n	886	1,606	631	249	501	3,873
	%	22.88	41.47	16.29	6.43	12.94	
Magazine/ comic	n	1,119	1,575	764	173	245	3,876
	%	28.87	40.63	19.71	4.46	6.32	

TABLE 2

NUMBERS AND PERCENTAGES OF STUDENTS INDICATING FREQUENCIES OF VARIOUS TYPES OF LEISURE READING, BY GENDER

Type of leisure Reading		Nearly every day		1-2 times a week		Few times a month		Few times a year		Hardly ever/ never	
		Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Book	n	665	1,030	628	550	335	208	128	42	205	82
	%	33.95	53.85	32.06	28.77	17.07	10.90	6.52	2.21	10.40	4.27
News- paper	n	535	351	791	814	268	363	118	132	249	252
	%	27.27	18.37	40.38	42.59	13.68	18.97	6.00	6.88	12.67	13.19
Magazine/ comic	n	565	554	697	878	404	360	111	62	186	59
	%	28.80	28.97	35.49	45.91	20.58	18.81	5.64	3.24	9.48	3.07

Relationships between amount of time spent in leisure reading and achievement on the reading test were positive. However, they are not very strong, ranging from r=.03 to .31. Further, the size of the correlation differs according to the type of leisure reading. Frequency of reading books (as opposed to reading newspapers or magazines) is more closely related to reading achievement in all domains (Table 3). The mean reading achievement score of pupils who read books daily or nearly every day was almost one standard deviation above the mean of pupils who said that they hardly ever or never read books (Table 4).

TABLE 3

CORRELATIONS BETWEEN VOLUNTARY READING ACTIVITIES AND READING SCALE SCORES IN NARRATIVE, EXPOSITORY, DOCUMENTS, AND TOTAL SCALE SCORE

Reading activities	Narrative	Expository	Documents	Total
Frequency of reading books	.28*	.26*	.25*	.31*
Frequency of reading a newspaper	.06*	.09*	.09*	.09*
Frequency of reading magazines/ comics	.04	.03	.07*	.04

* $p<.01$

TABLE 4

MEAN TOTAL SCALE SCORES (AND STANDARD DEVIATIONS) OF STUDENTS REPORTING VARYING FREQUENCIES OF LEISURE BOOK READING, BY GENDER

Frequency of book reading	Males (n=1,960)	Females (n=1,912)	Total (n=3,872)
Daily/Nearly every day (n=1,695)	263.77 (42.33)	264.50 (40.87)	264.21 (41.43)
Once/twice a week (n=1,178)	244.22 (46.65)	243.91 (39.79)	244.08 (43.56)
A few times a month (n=543)	242.73 (38.92)	240.89 (40.83)	242.01 (39.64)
A few times a year (n=170)	229.83 (42.22)	223.18 (32.26)	228.17 (39.99)
Hardly ever/never (n=285)	220.70 (42.09)	213.41 (34.58)	218.62 (40.16)

TV/Video Viewing and Playing Computer Games

There was considerable variation in the amount of time pupils were engaged with TV/videos and computer games. Over a quarter (29.56%) watched little or no TV on a school day (one hour a day or less). However 7 in 10 pupils watched TV or videos at least one hour each school day. Almost a fifth watched for more than three hours.

Time spent playing computer games was substantially less but also showed considerable variation. Nearly half of the respondents (45.28%) spent no time

playing computer games during school days, while nearly one-fifth (18.37%) spent an hour or more. A small minority (4.45%) spent three hours or more on school days. As one would expect, pupils spent more time watching TV and videos and playing computer games at weekends (Table 5).

TABLE 5

NUMBERS AND PERCENTAGES OF STUDENTS INDICATING VARYING AMOUNTS OF TIME VIEWING TV/VIDEOS AND PLAYING COMPUTER GAMES

Frequency of watching/playing		TV/Videos		Computer Games	
		School Days	Weekends	School Days	Weekends
No involvement	n	191	91	1,750	1,135
	%	4.96	2.36	45.28	29.36
Up to one hour a day	n	948	522	1,405	1,334
	%	24.60	13.51	36.35	34.52
Between one and two hours daily	n	1,119	842	387	716
	%	29.04	21.79	10.01	18.51
Two to three hours daily	n	859	1,100	151	328
	%	22.29	28.47	3.91	8.48
Three to five hours daily	n	473	653	89	167
	%	12.28	16.90	2.30	4.32
More than five hours daily	n	263	656	83	186
	%	6.82	16.98	2.15	4.81
Total N		3,853	3,864	3,865	3,866

Gender differences are evident in both TV viewing and playing computer games (Table 6). Overall, boys tended to be more involved in these activities, especially at the heaviest levels of use. For example, on school days, 23.80% of boys, but only 14.21% of girls, watched TV/videos for three hours or more. Gender differences in relation to computer games are even more striking. For example, at weekends, 28.29% of boys said that they played computer games for two hours or more, whereas the percentage for girls (6.25) is less than one quarter of this. Gender is significantly associated with time spent watching TV/videos, both during the week (χ^2=77.73; *df*=5; p<.001) and at weekends (χ^2=1772.78; *df*=5; p.<001), and with playing computer games during weekdays (χ^2=418.77; *df*=5; p.<001) and at weekends (χ^2=581.63; *df*=5; p.<001).

TABLE 6

NUMBERS AND PERCENTAGES OF STUDENTS INDICATING VARYING AMOUNTS OF TIME VIEWING TV/VIDEOS AND PLAYING COMPUTER GAMES, BY GENDER

Frequency of watching/playing		TV/Video		Computer Games	
Males		School Days	Weekends	School Days	Weekends
No involvement	n	98	47	619	335
	%	5.03	2.35	31.57	17.09
Up to one hour a day	n	431	225	780	590
	%	22.10	11.51	39.83	30.06
Between one and two hours daily	n	510	324	283	476
	%	26.14	16.58	14.43	24.26
Two to three hours daily	n	447	536	124	252
	%	22.93	27.49	6.32	12.82
Three to five hours daily	n	280	359	77	143
	%	14.31	18.38	3.88	7.24
More than five hours daily	n	186	463	78	167
	%	9.49	23.69	3.98	8.53
Total N		1,952	1,954	1,961	1,963
Females					
No involvement	n	93	44	1,131	800
	%	4.84	2.30	59.42	42.02
Up to one hour a day	n	517	297	623	744
	%	27.21	15.51	32.71	39.13
Between one and two hours daily	n	609	518	104	240
	%	32.05	27.13	5.46	12.61
Two to three hours daily	n	412	564	27	76
	%	21.68	29.54	1.42	3.99
Three to five hours daily	n	193	294	13	24
	%	10.16	15.40	0.68	1.26
More than five hours daily	n	77	193	6	19
	%	4.05	10.11	0.30	1.00
Total N		1,901	1,910	1,904	1,903

The relationship between reading achievement and TV/video viewing appears to differ from the relationship between reading achievement and computer games. Time spent viewing TV/videos during the week is not related to reading achievement, but time spent at weekends correlates negatively with

achievement. In the case of time spent playing computer games, both weekday and weekend playing are negatively correlated with reading achievement in all three reading literacy domains – notably Narrative scale scores – and with total scale score. Correlations with reading achievement are somewhat higher, though still small, for time spent on computer games during school days than for time spent on this activity at the weekend (Table 7).

TABLE 7.

CORRELATIONS BETWEEN TIME SPENT VIEWING TV/VIDEOS AND PLAYING COMPUTER GAMES, AND SCALE SCORES IN NARRATIVE, EXPOSITORY, DOCUMENTS, AND TOTAL

TIME spent watching/playing	Narrative	Expository	Documents	Total
TV/video viewing on school days	-.01	.00	.00	-.01
TV/video viewing at weekends	-.04*	-.04*	-.01	-.03*
Computer games on school days	-.14*	-.12*	-.10*	-.15*
Computer games at weekends	-.09*	-.07*	-.07*	-.10*

* $p<.01$

Correlations between the frequency with which pupils read books and the amount of time they spent watching TV are significant and negative, whether TV viewing was during the week (-.13) or during weekends (-.09). Correlations between the frequency with which pupils read books and the amount of time they spent playing computer games are also significant and negative, both for playing during the week (-.15) and during weekends (-.12). Like the other correlations reported here, however, they are relatively weak.

CONCLUSION

In this paper, we presented the results of analyses of data which were collected in 1998 in a national survey of the reading literacy achievements of fifth grade students. We found that girls read more frequently than boys in their leisure time; that reading scores are positively related to the frequency with which children read in their leisure time; that boys spend more time than girls watching TV and playing computer games; and that the frequency with which

children read is negatively related to the time they spend watching TV and playing computer games. Gender differences in the types of material read (i.e., more frequent reading of books by girls and more frequent reading of newspapers by boys) are consistent with previous Irish (Greaney & Hegarty, 1987) and cross-national (Elley, 1994) research. Two findings of particular concern are that over twice as many boys as girls say that they hardly ever or never read books, and around seven times as many boys as girls may be classed as heavy users of computer games. Concern arises from the fact that non-frequent voluntary book readers scored, on average, almost one standard deviation lower than frequent voluntary book readers.

Correlations between the various leisure activities were quite weak. It is highly likely that additional factors mediate these relationships, notably socioeconomic status and home process variables (Greaney & Hegarty, 1987; Marjoribanks, 1979). Correlations between reading achievement in the three domains and leisure time reading are similar to those reported by Elley (1994), although the correlation between book reading and Documents scores is perhaps higher than expected. It is of interest that the number of Irish pupils who watched TV for five or more hours a day seems to have decreased since the IEA study was carried out in 1991 (from 11.6% in 1991 to 6.8% in 1998). However, correlations between time spent watching TV during the week and reading achievement are not significant. This finding may come as a surprise. Children spend, on average, substantially more time watching TV than playing computer games, but despite this, the strength of the relationship between computer games and reading achievement is stronger.

Some of these findings can be compared with those of a national assessment of reading literacy of fifth grade students that was carried out in 1993 (Cosgrove et al., 2000). Two merit particular attention. First, the frequency with which students read newspapers daily or nearly every day declined from 30.79% in 1993 to 22.87% in 1998, while the frequency with which children read other types of materials remained almost the same. Secondly, the percentage of children watching two or more hours of television per day also declined, both during the week (from 48.89% to 41.39%) and at weekends (from 69.96% to 62.35%). This pattern may be due to increased amounts of time playing computer games, but unfortunately no data on this were collected in 1993.

It is obvious that leisure reading, TV, videos, and computer games play an important role in children's lives, given the amounts of time spent on these activities. However, rather than focusing on the possible negative effects of non-print media on reading achievement and leisure reading, it may be more constructive to attempt to unravel and investigate potentially positive effects of

computer games and TV on children's development. Print and non-print media are perfectly compatible with educational purposes; each medium has strengths and weaknesses that can be offset by another medium (Greenfield, 1984).

Given the pervasive reliance on computers in most areas of the labour market, there can be no doubt that computer literacy should be a central goal of education systems. Electronic games, the use of which in education has begun to some extent, may have a role to play in this. For example, Funk et al. (1997) discuss new 'Edutainment' software such as *Sim City*® and speculate about the positive impact it could have on children's development.

Some research has been carried out on the educational value of computer games. Grundy (1991), for example, examined an adventure game's educational potential and found that, although elementary school children read, learned about computers, and solved problems in the course of playing, the game itself did not meet specified criteria for a worthwhile educational experience. Perhaps electronic games - purely for fun - are best used to *introduce* children to the electronic world and to teach them the basic command functions of computers and accustom them to general computer skills such as mouse use. Or perhaps a greater variety of electronic games or programmes which are designed specifically for educational purposes are needed, such as that described by Reissman (1992) involving an interactive cloze test which teaches the importance of choosing words carefully, and would be a useful supplement to a vocabulary module. Perhaps we should be thinking of computer literacy as a school subject which can use electronic games as its springboard. There are already proposals for integrating computers into primary level curricula, and for a computer literacy curriculum that includes programming, word processing, databases, adventure games, and electronic mail (see Heaney, 1992).

There may also be scope to use TV to introduce children to complex reading material. Greenfield (1984) argues that it is ideal for teaching complex story plots, and cites experience of its use to get students to identify the conflict in a story plot and then to examine conflict in novels. He argues that the conflict exercise, using a familiar medium, was successfully generalized to the medium of print and that the study demonstrates the complementary nature of the media of TV and print, given the right conditions.

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