ARTICLE

Adolescent Screen Time and Attachment to Parents and Peers

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Objective: To examine associations between screen time (television, video or DVD, gaming, and computer use) and attachment to parents and peers in 2 cohorts of adolescents 16 years apart.

Design: Cross-sectional data regarding screen time and attachment to parents and peers were collected for 2 cohorts of adolescents, one in 1987-1988 (the Dunedin Multidisciplinary Health and Development Study [DMHDS] cohort) and the other in 2004 (the Youth Lifestyle Study [YLS] cohort).

Setting: Members of the DMHDS cohort were interviewed as part of a full day of assessment, and members of the YLS cohort completed a self-report questionnaire in a supervised classroom setting.

Participants: The DMHDS cohort (n=976) was aged 15 years in 1987-1988. The YLS cohort (n=3043) was aged 14 to 15 years in 2004.

Main Outcome Measures: Screen time and low attachment to parents and peers as measured by the Inventory of Parent and Peer Attachment.

Results: More time spent television viewing and less time spent reading and doing homework were associated with low attachment to parents for both cohorts. Among the YLS cohort, more time spent playing on a computer was also associated with low attachment to parents. Among the DMHDS cohort, more time spent television viewing was associated with low attachment to peers.

Conclusions: Screen time was associated with poor attachment to parents and peers in 2 cohorts of adolescents 16 years apart. Given the importance of attachment to parents and peers in adolescent health and development, concern about high levels of screen time among adolescents is warranted.

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Over the past 20 years, there has been a marked expansion in screen-based communication and entertainment options available to adolescents. In addition to existing technologies such as television, video, and computer games, many adolescents have access to console games, text messaging, e-mail, online instant messaging, and social networking Web sites.[1,2] The availability and attractiveness of screen time activities has provoked excitement about the opportunities afforded by these options,[1,3,4] as well as concern about whether these displace other activities that are important for health and development.[5-7] One area of interest is how screen time may affect the quality of relationships with family and friends.[8-10]

Among adolescents, strong attachment to parents is protective against poor psychological health and participation in risky health behaviors.[11-15] Strong attachment to peers is also associated with better psychological health and social competence but, in contrast, is associated with more participation in risky behaviors.[11,15,16]

Thus far, few studies have examined associations between attachment to parents and peers and different forms of screen time, and findings have been mixed. One study[17] reported poorer family functioning among male adolescents who viewed programs with more violent content, but another study[18] reported no association between television viewing and family relationships. No association was reported between screen time viewing (television, video, and gaming) and peer problems,[19] although anecdotal concerns have been raised that limited television viewing may inhibit peer relationships through an inability to discuss popular shows and characters. Studies[20-22] that specifically examined gaming (computer or video games) also reported conflicting findings.

Internet use has received the most research attention of all screen time types. While one study[6] reported no difference in family interaction associated with more Internet use among children, others re-

ported that more Internet use is associated with less family time,[23] reduced quality of family relationships,[24] poorer maternal relationships,[25] and greater paternal alienation.[26] A notable aspect of these studies is that some associations were dependent on what the Internet was being used for, with no adverse association when the Internet was being used for educational activities[23] and with higher attachment to parents among adolescents who used the Internet for learning.[24] There are also contrasting findings in terms of relationships with peers, with low Internet use being associated with a better relationship with peers[25] and with high Internet use being associated with more socializing with friends.[23]

The present study examined associations between adolescent screen time and attachment to parents and peers using 2 cohorts of adolescents 16 years apart. Study 1 explores associations between television viewing and attachment to parents and peers in the Dunedin Multidisciplinary Health and Development Study (DMHDS) cohort, who were aged 15 years in 1987-1988. Study 2 examines associations between screen time and attachment to parents and peers in the Youth Lifestyle Study (YLS) cohort, who were aged 14 to 15 years in 2004. In this cohort, the range of media examined includes television viewing, computer use (not for homework), playing on a computer and console gaming, and reading and homework.

METHODS

STUDY 1

Participants

The DMHDS is an ongoing longitudinal study of health and behavior among a cohort born in Dunedin, New Zealand, between April 1, 1972, and March 31, 1973.[27] The cohort of 1037 was first established at age 3 years and included 91% of those who were born in Dunedin during the period and still resided in the Dunedin area at age 3 years. The cohort has been followed up regularly, and the focus herein is on the assessment of 976 adolescents (49% female and representing 94% of surviving study members) at age 15 years.

Procedures and Measures

At age 15 years, members of the DMHDS cohort were invited to spend a day at the Dunedin research unit. They were assessed as close to their 15th birthday as possible (usually within 1-2 months).

Television viewing was assessed by self-report of the number of hours that they usually watched television on a school day.[28] Attachment to parents and peers was assessed using a shortened version of the Inventory of Parent and Peer Attachment (IPPA).[29,30] This modified IPPA contained 24 items (12 related to parents and 12 related to peers).[30] At age 15 years, socioeconomic status (SES) was assessed by the parents' self-reported occupational status based on a 6-point scale of the educational levels and income associated with that occupation in data from the New Zealand Census.[31] The higher SES of either parent was used herein. At age 15 years, parents of study members were asked how many children there were in their family and if there was a mother figure or father figure present in the home. The latter measures were combined to give a measure of single-parent or dual-parent household.

Statistical Analysis

Univariate and multivariate logistic regression analyses with bootstrapped SEs were used to calculate relative risks for associations between low attachment scores (defined as the bottom 20% of attachment scores) and time spent television viewing at age 15 years. The dichotomized measure was used because of differing distributions in attachment scores for the 2 cohorts. In the multivariate model, this association was examined after controlling for the influence of sex, family SES, single-parent or dual-parent household, and number of siblings.

STUDY 2

Participants

The YLS cohort consisted of students from randomly selected schools among all state and state-integrated New Zealand secondary schools. If a school in this selected group refused to participate, a replacement school was selected from a backup list of randomly selected schools. Year 10 and year 12 students from each school were surveyed, with complete data available for 3983 students from 144 schools. The focus herein is on the assessment of 3043 students (49% female) who were aged 14 to 15 years in 2004.

Procedures and Measures

In July and August 2004, students completed confidential questionnaires within a classroom setting during school time. Survey completion was supervised by trained interviewers.

Students were asked, "In your free time, on an average weekday, how many hours do you spend (a) television and video or DVD viewing? (b) reading and doing homework? (c) using a computer (not for homework)? and (d) playing games on computers, Nintendo (Nintendo of America Inc, Redmond, Washington), Xbox (Microsoft, Redmond, Washington), or PlayStation (Sony Computer Entertainment American Inc, Foster City, California)?" The total amount of time spent on the sum of these activities was limited to 24 hours (allowing for multitasking), which resulted in 133 responses being excluded.

Attachment to parents and peers was assessed using the same 12-item scale from the modified IPPA that was used for the DMHDS cohort.[29,30] Socioeconomic status in the YLS cohort was estimated using school deciles that indicate the SES of a school's community obtained from Ministry of Education records. A lower school decile is associated with lower community SES. Deciles were categorized into the following 3 groups: low (deciles 1-3), mid (deciles 4-6), and high (deciles 7-10).

Statistical Analysis

Univariate and multivariate logistic regression analyses with bootstrapped SEs were used to calculate relative risks for associations between low attachment scores (defined as the bottom 20% of scores) and time spent television viewing, reading and doing homework, computer use (not for homework), and playing on a computer and console gaming. Multivariate models controlled for sex and school decile. Because the measures of computer use and gaming were not independent, the measure with the strongest association in univariate models was used in the multivariate model (ie, computer use in the model for attachment to parents and gaming in the model for attachment to peers).

Table 1. Inventory of Parent and Peer Attachment Scores and Screen Hours per Weeknight Among the Dunedin Multidisciplinary Health and Development Study Cohort (1987-1988) (DMHDS) and the Youth Lifestyle Study Cohort (2004) (YLS)

	Female Adolescents		Male Adolescents		Total	
Variable	No.	Score, Mean (SD)	No.	Score, Mean (SD)	No.	Score, Mean (SD)
DMHDS						
Attachment to parents	458	29.5 (5.8)	486	29.5 (5.6)	**944**	29.5 (5.7)
Attachment to peers	462	30.3 (5.0)	484	25.8 (5.6)	**946**	28.0 (5.8)
Television viewing	388	2.9 (1.6)	417	3.2 (1.7)	**805**	3.0 (1.7)
YLS						
Attachment to parents	1358	22.6 (8.1)	1357	23.4 (8.2)	**2715**	23.0 (7.9)
Attachment to peers	1385	24.8 (9.0)	1390	21.0 (6.7)	**2775**	22.9 (10.4)
Television viewing	1442	3.2 (3.6)	1468	3.3 (3.8)	**2910**	3.2 (4.5)
Gaming	1442	0.6 (2.3)	1467	1.9 (3.6)	**2909**	1.3 (3.7)
Computer use	1442	1.4 (2.3)	1468	1.6 (2.9)	**2910**	1.5 (3.1)
Reading and doing homework	1442	1.6 (2.5)	1468	1.3 (2.4)	**2910**	1.4 (2.7)
Television viewing and computer use[a]	1442	4.5 (3.8)	1468	4.8 (4.6)	**2910**	4.7 (5.3)
Television viewing and gaming[a]	1442	3.8 (4.9)	1467	5.2 (5.4)	**2909**	4.5 (6.5)

[a]Combined time.

RESULTS

STUDY 1

For the DMHDS cohort, descriptive statistics for the measures of attachment to parents and peers and time spent television viewing are given in **Table 1**. Adolescents who spent more time television viewing had greater risk of low attachment to parents and peers (**Table 2**). These associations remained significant after accounting for sex and family factors. For every extra hour spent television viewing, there was a 13% increase in the risk of having low attachment to parents and a 24% increase in the risk of having low attachment to peers.

STUDY 2

For the YLS cohort, descriptive statistics for the measures of attachment to parents and peers and screen time are given in Table 1. More time spent television viewing and using a computer was associated with lower attachment to parents (**Table 3**). More time spent reading and doing homework was associated with higher attachment to parents. These findings remained significant after controlling for sex and SES. More time spent on the combined measures of screen time (television viewing plus computer use and television viewing plus gaming) was also associated with lower attachment to parents in univariate models. In multivariate models, for every extra hour spent television viewing and playing on a computer, there was a 4% and 5% increase, respectively, in the risk of having low attachment to parents. In univariate models, more time spent gaming was associated with low attachment to peers. This association did not persist after controlling for other factors.

COMMENT

The key finding from this study is that more time spent television viewing is associated with low attachment to parents. The association was significant in 2 cohorts of adolescents 16 years apart and persisted after controlling for aspects of SES and family composition. More television viewing was associated with poor attachment to peers among the DMHDS cohort but not among the YLS cohort. These are important additions to previous mixed findings relating to television viewing and attachment to parents and peers.[17,18] Recommendations that children watch less television are sometimes met with the concern that being unable to discuss popular shows or characters may inhibit peer relationships. The findings herein do not suggest that less television viewing is detrimental to adolescent friendships.

Among the YLS cohort, spending more time playing on a computer (not for homework) was associated with poor attachment to parents, while spending more time playing on a computer and console gaming was associated with poor attachment to peers (in univariate analyses only). These findings are consistent with other studies[24-26] that found inverse associations between attachment to parents and peers and Internet use but not with another study[20] that found an association between better family relationships and playing computer games. Future studies would benefit from assessing specific details about the type, purpose, and content of activities undertaken during computer use and console gaming. In the present study, various activities were combined together under "computer use" (eg, gaming, Internet surfing, e-mailing, and online chat) and under "gaming" (eg, computer vs console games, online vs offline, single vs multiplayer), which makes it difficult to untangle potential differences in associations. Another finding in the present study is that more time spent reading and doing homework was associated with higher attachment to parents. Although these are novel findings, they are consistent with a previous study[24] that found a positive association between family relationships and using the Internet for educational purposes.

An important limitation of these analyses is that causal direction cannot be established for the associations observed between screen time and attachment to parents

Table 2. Association Between Low Attachment to Parents and Peers and Television Viewing Among the Dunedin Multidisciplinary Health and Development Study Cohort

Variable	Univariate Analysis		Multivariate Analysis	
	No.	Risk Ratio (95% Confidence Interval)	No.	Risk Ratio (95% Confidence Interval)
Attachment to parents				
Television viewing	790	1.14 (1.02-1.26)[e]	713	1.13 (1.00-1.26)[e]
Sex[a]	944	0.99 (0.71-1.26)	713	0.69 (0.42-0.96)[e]
Socioeconomic status[b]	847	1.13 (0.97-1.29)	713	1.09 (0.91-1.27)
Single-parent household[c]	915	1.24 (0.80-1.67)	713	1.41 (0.66-2.17)
Siblings[d]	920	1.00 (0.84-1.15)	713	1.12 (0.88-1.36)
Attachment to peers				
Television viewing	790	1.20 (1.08-1.33)[e]	714	1.24 (1.08-1.40)[e]
Sex[a]	946	3.11 (1.88-4.34)	714	2.31 (1.61-3.31)[e]
Socioeconomic status[b]	850	1.07 (0.94-1.19)	714	0.99 (0.82-1.17)
Single-parent household[c]	917	0.83 (0.48-1.19)	714	0.58 (0.09-1.07)
Siblings[d]	923	1.08 (0.90-1.25)	714	1.19 (0.92-1.47)

[a] Reference group is female sex.
[b] Reference group is higher socioeconomic status.
[c] Reference group is dual-parent household.
[d] Reference group is fewer siblings.
[e] $P < .05$.

Table 3. Association Between Low Attachment to Parents and Peers and Screen Time Among the Youth Lifestyle Study Cohort

Variable	Univariate Analysis		Multivariate Analysis	
	No.	Risk Ratio (95% Confidence Interval)	No.	Risk Ratio (95% Confidence Interval)
Attachment to parents				
Television viewing	2715	1.06 (1.02-1.10)[c]	2661	1.04 (1.01-1.08)[c]
Reading and doing homework	2715	0.90 (0.84-0.97)[c]	2661	0.90 (0.84-0.96)[c]
Computer use	2715	1.07 (1.02-1.12)[c]	2661	1.05 (1.02-1.09)[c]
Gaming	2715	1.02 (0.97-1.07)	. . .	. . .
Sex[a]	2715	0.68 (0.57-0.79)[c]	2661	0.65 (0.55-0.75)[c]
Decile[b]	2661	0.93 (0.82-1.05)	2661	0.98 (0.95-1.00)
Television viewing and computer use	2715	1.06 (1.02-1.09)[c]	. . .	. . .
Television viewing and gaming	2715	1.04 (1.01-1.07)[c]	. . .	. . .
Attachment to peers				
Television viewing	2775	1.00 (0.97-1.03)	2715	0.99 (0.95-1.03)
Reading and doing homework	2775	0.98 (0.91-1.04)	2715	0.98 (0.91-1.05)
Computer use	2775	1.02 (0.98-1.06)	. . .	. . .
Gaming	2774	1.07 (1.02-1.11)[c]	2715	1.03 (0.98-1.09)
Sex[a]	2775	2.10 (1.51-2.69)[c]	2715	1.96 (1.37-2.54)[c]
Decile[b]	2716	0.93 (0.80-1.07)	2715	0.97 (0.92-1.02)
Television viewing and computer use	2775	1.01 (0.98-1.03)	. . .	. . .
Television viewing and gaming	2774	1.03 (1.00-1.05)	. . .	. . .

Abbreviation: Ellipses, not applicable.
[a] Reference group is female sex.
[b] Reference group is low school decile (ie, community with low socioeconomic status).
[c] $P < .05$.

and peers. There are plausible mechanisms by which large amounts of screen time may affect the development or maintenance of attachment to parents (eg, adolescents who have a television in their bedroom not only watch more television but also share fewer meals with family members[32]). However, it is also possible that adolescents with poor attachment relationships with immediate friends and family use screen-based activities to facilitate new attachment figures such as online friendships[26] or parasocial relationships with television characters or personalities.[33]

In addition to the establishment of causal direction, another issue for further research is a possible decline in the mean attachment scores between the 2 cohorts examined herein. The 2 cohorts had different sampling methods, procedures, and historical and technological contexts, which may explain the difference in scores. However, additional research to explore this issue is warranted given the potential importance of any lessening of attachment relationships with friends and family between 2 generations.

In conclusion, our findings indicate that adolescents who watch more television, spend more time playing on

a computer, and spend less time reading and doing homework are more likely to report poor attachment to parents. In addition, more time spent television viewing was associated with low attachment to peers among the DMHDS cohort. Given the importance of attachment to parents and peers for adolescent health and development, concern about high levels of screen time among adolescents is warranted. With the rapid advance of screen-based options for entertainment, communication, and education, ongoing research is needed to monitor the effect that these technologies have on social development and psychological and physical well-being among adolescents.

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