



# Does Technology Use Protect Adolescents from Developing Psychological Problems?

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## Abstract

This study examined the relationship between technology use and psychological adjustment in a diverse community sample of 328 14-16 year-old adolescent boys and girls. Primary goals of the study were to explore whether technology use differs by gender, whether technology use is related to adolescent psychological problems, and whether technology use moderates the relationship between parental alcoholism and adolescent psychological adjustment. Gender differences in technology use were observed, with boys spending more time playing video games than girls and girls spending more time talking on the phone than boys. However, none of the types of technology examined (frequency of television viewing, talking on the phone, e-mailing/IMing, text messaging, playing video games, and "surfing the Web") were significantly associated with depression or anxiety. Moreover, for boys, technology use appeared to act as a protective factor. Boys who spent relatively more time playing video games and watching television had the lowest levels of anxiety, especially boys from alcoholic homes. In contrast, the opposite pattern was observed for girls.

## Sample

- 328 adolescent boys and girls (58% girls)
- Diverse sample – 41% Caucasian; 22% African-American; 24% Hispanic; 5% Asian
- Age range = 14-16 years old; Mean age = 14.99 (SD=.70)
- All participants were 9th or 10th grade students attending public high schools in Delaware, Maryland, or Pennsylvania
- Most of the adolescents lived with both of their biological parents (52%); 83% reported living with their biological mother; 12% reported living with a step father; 3% reported living with a step mother; 1% reported living with an adoptive mother; and 1% reported living with an adopted father

## Measures

**Parental Alcoholism.** The 6-item Children of Alcoholics Screening Test-6 (CAST; Jones, 1981) was used to assess parental alcohol use. A sample item from this measure is "Have you ever thought that one of your parents had a drinking problem?" For each CAST item, the adolescent was asked to state whether their answer was in reference to their biological mother, biological father, step mother, step father, adoptive mother, or adoptive father. The response codes for the items were 0 = "no" and 1 = "yes." The six items were summed to create a scale score for each parental figure. In this study, an adolescent who had a biological father or biological mother with a CAST score of 2 or greater was classified as having an alcoholic parent. Prior research (Clair & Genest, 1992; Dinning & Berk, 1989) has supported the validity and reliability of the CAST-6.

## Measures

**Adolescent Technology Use.** All of the adolescents were asked how much time they spent watching television, talking on the phone, text messaging, e-mailing/IMing, playing video games or computer games, and "surfing the Web" "on an average/typical day." The response scale ranged from 1 = "none" to 6 = "4 or more hours a day."

**Adolescent Depression.** The 20-item Center for Epidemiological Studies Depression Scale for Children (CES-DC; Weissman, Orvaschell, & Padian, 1980) was used to assess adolescent depressive symptomatology. The 20 CES-DC items were summed to create a total score. This measure has been shown to have good psychometric properties (Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986). In the present sample, the Cronbach alpha coefficient for the CES-DC was .91.

**Adolescent Anxiety.** The 41-item Screen for Child Anxiety Related Disorders (SCARED; Birmaher, Khetarpal, Cully, Brent, & McKenzie, 1995) was used to assess adolescent anxiety. The SCARED items were summed to reflect an overall level of anxiety symptomatology. The SCARED has been shown to have good reliability and validity characteristics (Birmaher, Khetarpal, Cully, Brent, & McKenzie, 2003). In the present sample, the Cronbach alpha coefficient for the SCARED total score was .91.

## Results

**The Effects of Gender and Parental Alcoholism on Technology Use** A Multivariate Analysis of Variance (MANOVA) was conducted to examine the effects of gender and parental alcoholism on technology use. The multivariate effect was significant  $\{F(6,282) = 427.59, p < .001\}$ . A significant main effect also emerged for gender  $\{F(6,282) = 17.15, p < .001\}$ . As shown in Table 1, girls reported spending significantly more time talking on the phone than boys  $\{F(1,287) = 15.76, p < .001\}$ . In contrast, boys reported spending significantly more time playing video games than girls  $\{F(1,287) = 63.24, p < .001\}$ . A trend also emerged for e-mailing/IMing  $\{F(1,287) = 3.88, p = .05\}$ , with girls reporting that they spent more time e-mailing/IMing than boys (see Table 1). Significant main effects for parental alcoholism were not found.

Table 1  
Main Effects of Parental Alcoholism and Gender on Technology Use and Psychological Problems

	Parental Alcoholism		Gender		Scale Range
	No	Yes	Male	Female	
<b>Technology Use</b>					
Watching TV	4.20 (.09)	4.04 (.17)	4.10 (.15)	4.13 (.13)	1-6
Talking on the phone	3.28 (.10)	3.46 (.20)	2.93 (.17)	3.81 (.15)***	1-6
Playing video games	2.58 (.09)	2.59 (.18)	3.37 (.15)	1.80 (.13)***	1-6
E-mailing or IMing	2.77 (.11)	2.57 (.21)	2.44 (.18)	2.91 (.16)**	1-6
Text messaging	2.14 (.10)	2.07 (.19)	1.92 (.17)	2.28 (.14)	1-6
Surfing the Web	3.21 (.11)	3.08 (.21)	3.05 (.18)	3.24 (.15)	1-6
<b>Psychological Problems</b>					
Anxiety	19.56 (.73)	22.90 (1.44)*	18.90 (1.24)	23.56 (1.05)**	0-82
Depression	37.29 (.73)	39.17 (1.44)	37.34 (1.24)	39.12 (1.04)	20-80

Means (and standard errors) are presented. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

## Results

**The Moderating Effects of Technology Use on the Relationship between Parental Alcoholism and Adolescent Psychological Adjustment** Factorial ANOVA models were conducted to examine the interactions between parental alcoholism and the use of specific types of technology. Separate models were conducted for each measure of technology use, yielding five models each for anxiety and depression. All of the anxiety models were significant. In contrast, none of the depression models were significant. A significant main effect for gender was observed in all of the anxiety models and a significant main effect for parental alcoholism was found in the video games, e-mailing/IMing, and Internet models. Additional significant effects are noted below.

### Television Viewing

The overall effect for the anxiety model was significant  $\{F(7,296) = 3.04, p < .01\}$ . The main effect for television viewing was not significant. However, a significant two-way interaction was found between gender and television viewing  $\{F(1,288) = 4.96, p < .05\}$  (see Figure 1).

### Talking on the Telephone

The overall effect for the anxiety model was significant  $\{F(7,295) = 2.63, p < .05\}$ . The main effect for talking on the telephone on adolescent anxiety was not significant and none of the interactions were significant.

### Playing Video Games

The overall effect for the anxiety model was significant  $\{F(7,294) = 3.86, p < .001\}$ . A significant main effect was not observed for playing video games. However, a significant two-way interaction was found between gender and playing video games  $\{F(1,286) = 10.39, p < .01\}$  (see Figure 2). A significant three-way interaction between parental alcoholism, gender, and playing video games also was found  $\{F(1,286) = 6.52, p < .05\}$  (see Figures 3a and 3b).

### E-mailing and IMing

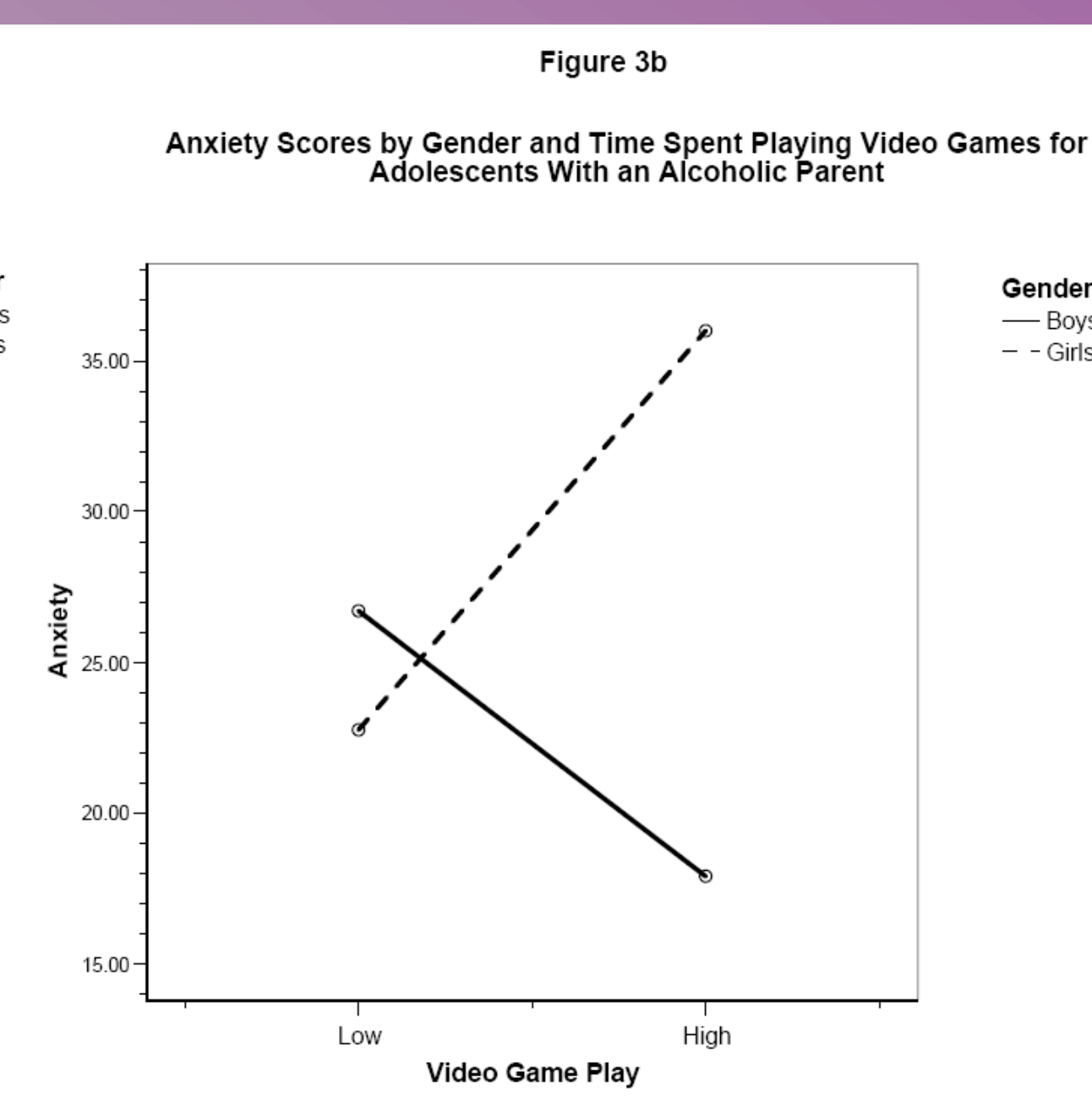
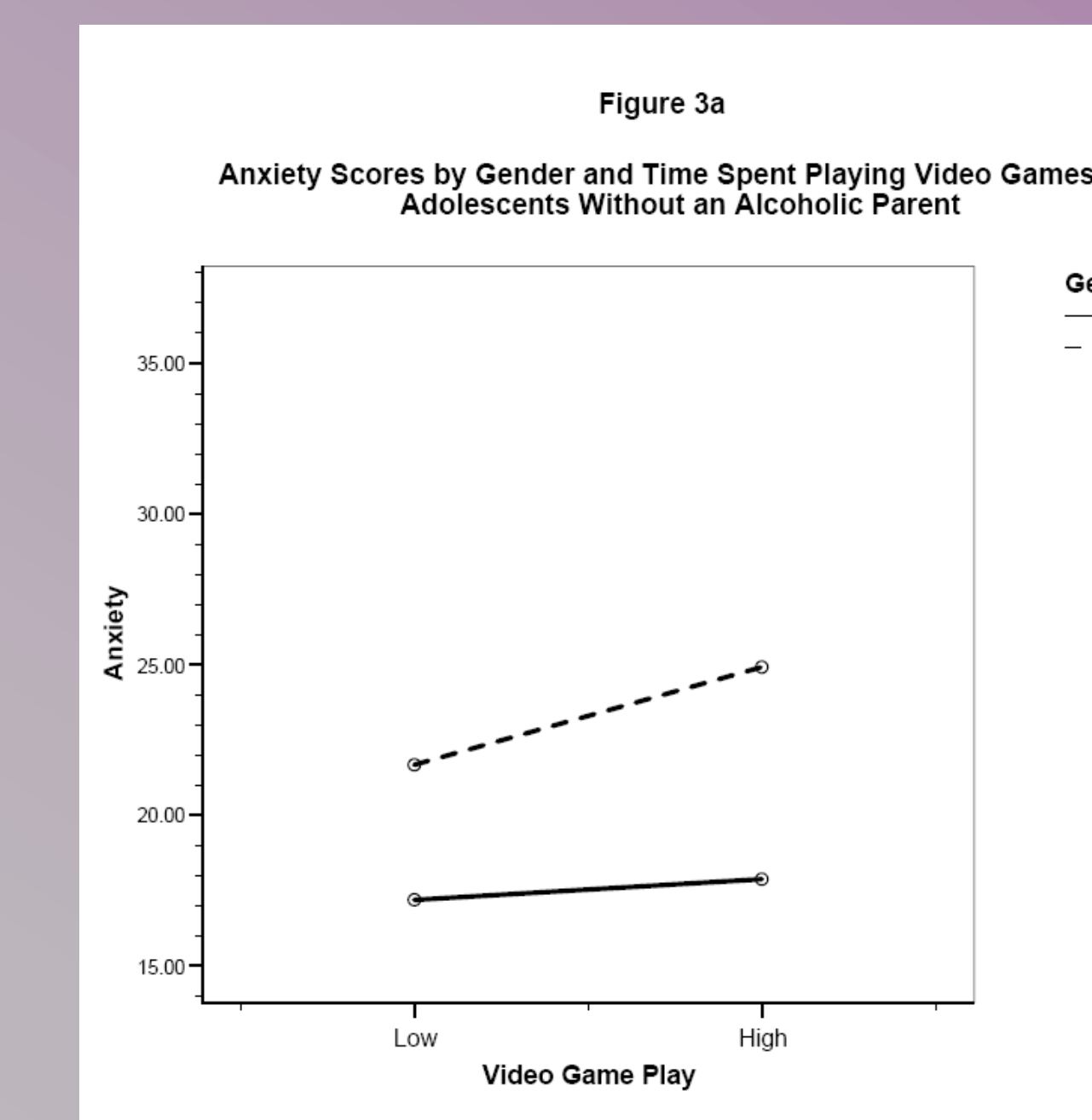
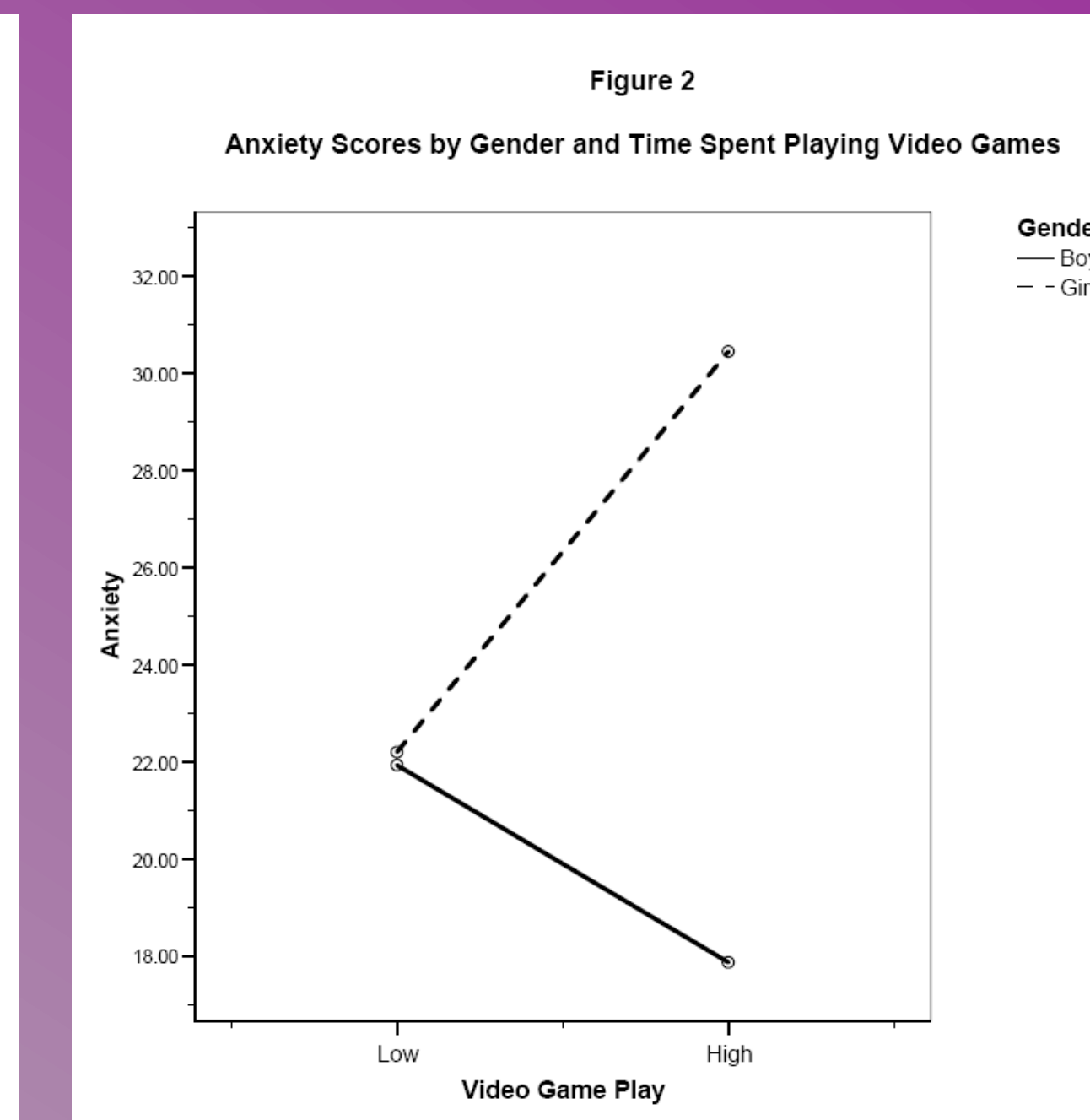
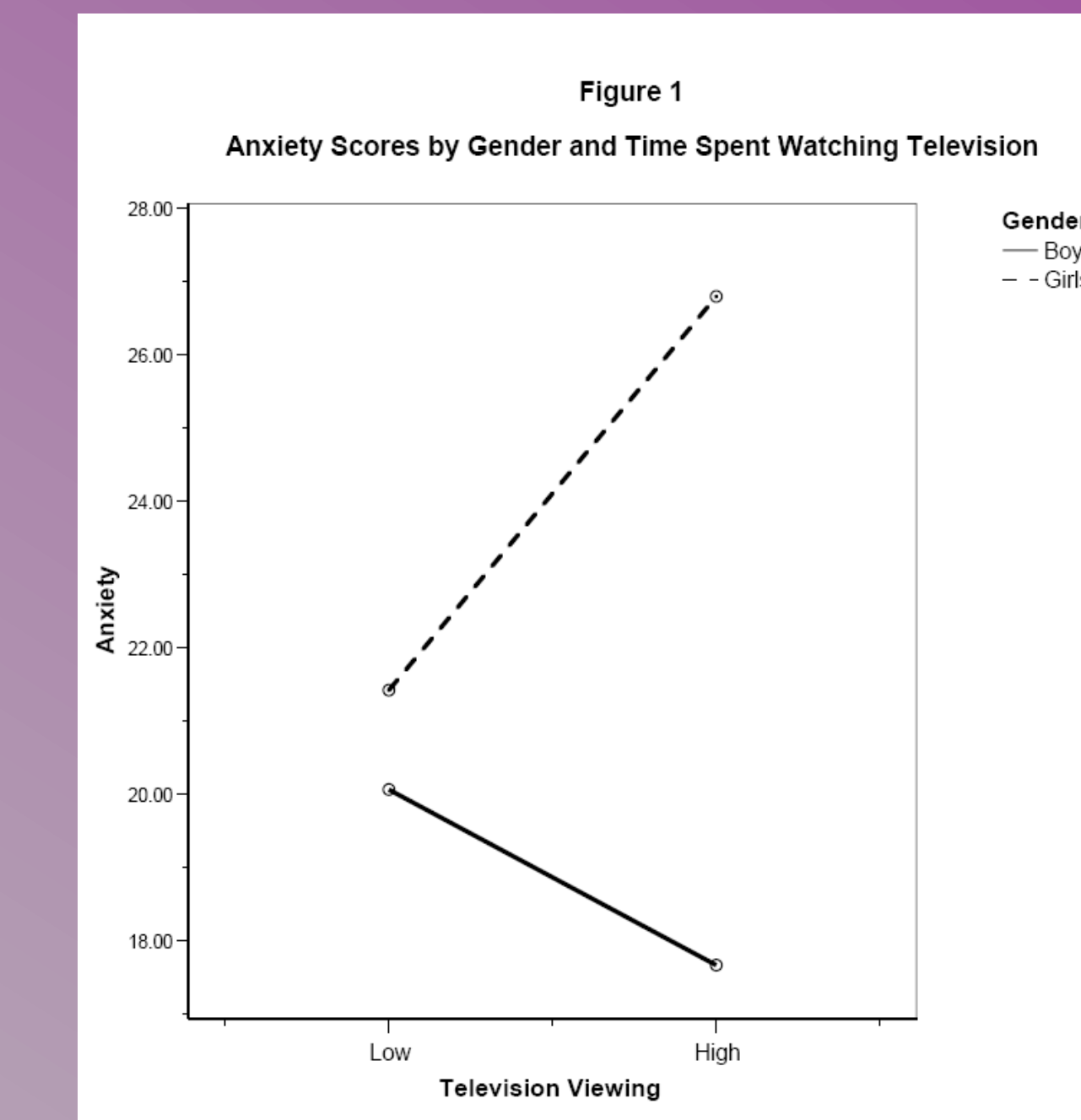
The overall effect for the anxiety model was significant  $\{F(7,294) = 2.18, p < .05\}$ . The main effect for e-mailing/IMing was not significant and none of the interactions were significant.

### Text Messaging

The overall effect for the anxiety model was significant  $\{F(7,295) = 2.26, p < .05\}$ . A main effect for text messaging was not observed and none of the interactions were significant.

### "Surfing the Web/Internet"

The overall effect for the anxiety model was significant  $\{F(7,294) = 3.02, p < .01\}$ . A main effect for "surfing the Web" was not found. However, a significant two-way interaction was observed between parental alcoholism and "surfing the web"  $\{F(1,286) = 4.64, p < .05\}$ .



## Conclusions

Consistent with the literature, boys spent more time playing video games than girls. In contrast, girls spent more time talking on the phone than boys. Of note, the pattern of associations between technology use and adolescent psychological adjustment was strikingly consistent. None of the types of technology examined was related to depression or to anxiety. Moreover, the results suggest that the use of technology may potentially be beneficial for the psychological health of adolescents, particularly for boys. More specifically, boys who watched the most television and boys who played video games the most had the lowest levels of anxiety. In contrast, girls who spent the most time playing video games reported the highest levels of anxiety. Consistent with the pattern of relations just discussed, when adolescents with an alcoholic parent were examined, watching television and playing video games acted as protective factors for boys, but not for girls. In sum, results from the present study indicate that the use of technology is not directly related to psychological problems during middle adolescence. Moreover, the findings suggest that the use of technology may even be beneficial for boys. These findings are particularly encouraging given how entwined technology is becoming in the lives of adolescents.

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