

## **TAIWANESE ADOLESCENTS' PERCEPTIONS AND ATTITUDES REGARDING THE INTERNET: EXPLORING GENDER DIFFERENCES**

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### **ABSTRACT**

The purpose of this study was to explore adolescents' perceptions and attitudes regarding the Internet, by gender. Data were collected from 636 high school students in Taiwan. It was found that male adolescents perceived the Internet more as a "toy," while female adolescents perceived the Internet more as a "technology," "tool" or "tour." Results indicated that females held more pragmatic views of the Internet, whereas males believed they could obtain more enjoyment from the Internet. In addition, males expressed significantly more positive attitudes than did females on two aspects of the Internet: usefulness and perceived control. However, no significant gender differences were found in terms of the affection and behavior aspects of using the Internet. More importantly, females tended to show higher Internet self-efficacy than did males. It is suggested that gender differences regarding the Internet might be narrowing because female adolescents are acquiring more experience with it.

### **INTRODUCTION**

Undoubtedly, adolescents have become one of the major groups using the Internet. Most adolescents not only have considerable experience using it, but also have their own personal Internet-related equipment for participating in many activities it affords. Adolescents have many opportunities to join the world of the Internet, regardless of their goals of usage, such as researching information, communicating, or playing on-line games. For adolescents, using the Internet may be part of the routine of daily life or for future work. Since most adolescents have

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considerable experience in using the Internet, it would be interesting to explore their perceptions and attitudes toward it, especially with regard to gender differences.

Over the past decade, researchers have investigated people's perceptions or attitudes regarding computers and the Internet (e.g., Colley, 2003; Kadijevich, 2000; Schumacher & Morahan-Martin, 2001; Tsai, 2004), particularly gender differences. These studies, in general, revealed that male students have more favorable attitudes; for example, males were found to have lower anxiety and higher control when using the Internet (e.g., Tsai et al., 2001). Further, in studying adolescents' attitudes toward computers, Colley (2003) examined gender differences in perceptions of school computing by asking their preferences in using computers at school. Her research revealed that girls perceived computers as tools for accomplishing tasks, while boys approached them as technology for play and mastery. She further suggested that these gender differences were important for understanding how computers are approached and utilized in educational settings by adolescents (Colley, 2003). Moreover, Liaw and Huang (2003) proposed that the perceptions of a new technology (such as the Internet) and how it has been accepted, shaped the factors that affected individual desires to use related products in the new technology. Therefore, exploring adolescents' perceptions regarding the Internet may be crucial to determining the intentions of its usage. The exploration of gender differences may also provide more insights into the stereotype that computing or Internet use is a masculine-dominated technology.

Tsai (2004), in interviewing forty adolescents, developed four categories to describe adolescents' perceptions of the Internet, including the Internet as technology, tool, toy, and tour. He found that many adolescents perceived the Internet as a tool, some simply as a technology, and some as a toy. However, gender differences were not addressed in the research. Therefore, based upon the research of Tsai (2004), the present study explores adolescents' perceptions of the Internet by both genders.

Furthermore, many researchers have noted that attitude toward a new technology plays an important role in its acceptance and usage (Liaw, 2002; Tsai & Lin, 2001). Although educators have developed some scales to measure adolescents' computer attitudes, few such scales were constructed specifically for exploring adolescents' attitudes toward the Internet; the one developed by Tsai, Lin, and Tsai (2001) may be one of the few. They have developed an Internet Attitude Scale for high school students with the following four subscales: perceived usefulness, affection, control, and behavior toward the Internet. The

research findings in the study, similar to most former research about computers, revealed that male adolescents had more positive attitudes toward the Internet than did female adolescents on all subscales.

However, Tsai (2002) explored 155 adolescents' attitudes toward computers, and found that they were not related to gender. Although computers have often been considered a masculine domain, it is true that females are utilizing computers (or the Internet) at a highly increasing rate. Rainer, Laosethakul, and Astone (2003) pointed out that the gender gap in computer usage and attitudes after 1995 has been gradually lessening. The gender difference regarding computers may be progressively smaller, but whether there is a similar tendency for attitude toward the Internet requires investigation.

In addition, the present study integrated the Internet attitude scale with some Internet self-efficacy subscales. According to Tsai and Tsai (2003), learners with high Internet self-efficacy performed better and learned better in an Internet-related learning task. Internet self-efficacy may be another important factor that shapes adolescents' attitudes toward the Internet. Nevertheless, some studies have shown that females generally had lower self-efficacy with reference to computers or the Internet (Durndell, & Haag, 2002; Jackson, Ervin, Gardner, & Schmit, 2001; Whitley, 1997). Durndell and Haag (2002) further found significant correlations among higher computer self-efficacy, lower computer anxiety, more positive attitudes toward the Internet and longer reported use of the Internet. The present study views Internet self-efficacy as part of Internet attitudes, with gender differences on self-efficacy also investigated.

A review of the literature indicated the following: (1) Studies related to computers or the Internet focused mainly on college students or adults; not many studies involved adolescents as the target population. (2) More studies assessed attitudes toward computers, but only a few focused specifically on the Internet. (3) Little research has explored perceptions of the Internet. The present study stresses the belief that perceptions, similar to attitudes, are also important as a guide to Internet-related behaviors. (4) The study views Internet self-efficacy as a part of attitudes toward the Internet; very few studies have investigated adolescents' Internet self-efficacy. (5) Since it seems that the gender difference regarding computer-related attitudes has gradually lessened, the present study investigated the following questions: (1) Are there gender differences in adolescents' perceptions of the Internet? (2) Are there gender differences in adolescents' attitudes (and self-efficacy) regarding the Internet?

### *Subjects*

The subjects in this study were 636 high school adolescents (16 to 18 years old). These students attended five high schools from different demographic areas of Taiwan; 327 are males and 309 are females.

### *Instrument*

The study utilized a questionnaire to assess adolescents' perceptions and attitudes toward the Internet. The questionnaire included 33 items that were scored on a 6-point Likert scale ("strongly agree," "agree," "somewhat agree," "somewhat disagree," "disagree," and "strongly disagree"). These items could be divided into three major parts. The first part, consisting of 4 items, investigated adolescents' perceptions of the Internet. The second part, consisting of 20 items, assessed their general attitudes toward the Internet. The third part, consisting of 9 items, explored their Internet self-efficacy. In this study, Internet self-efficacy was viewed as one component of Internet attitudes. A description of these items is presented below.

The first four items were based upon the research of Tsai (2004), which classified adolescents' perceptions of the Internet into categories "technology," "tool," "toy," and "tour." The purpose was to explore adolescents' agreement about their perceptions of these categories. The items for this part were: (1) "For me, the Internet is perceived as a technology." (2) "For me, the Internet is perceived as a tool." (3) "For me, the Internet is perceived as a toy." (4) "For me, the Internet is perceived as a tour."

The second part of the questionnaire also included 20 items based on an Internet Attitude Scale for high school students, developed by Tsai et al. (2001). These items were divided into four subscales; perceived usefulness, affection, perceived control, and behavior (5 items for each subscale). In this study, the reliability coefficients (Cronbach's alpha) were adequate for all four subscales (.72, .79, .73, and .64, respectively). A short description of the subscales is as follows: (1) The perceived usefulness subscale measures adolescents' perceptions of the positive impact of the Internet on individuals and society, such as "The internet helps me acquire relevant information I need." (2) The affection subscale assesses adolescents' feelings and anxiety when using the Internet, such as "The Internet makes me uncomfortable," or "I hesitate to use the Internet in case I look stupid." (3) The perceived control subscale measures adolescents' confidence about the indepen-

dent control of the use of the Internet (e.g., "I do not need someone to tell me the best way to use the Internet"). (4) The behavior subscale explores adolescents' actual use of the Internet, such as "I use the Internet regularly throughout school."

The remaining nine items, the final part of the questionnaire, were included to assess adolescents' Internet self-efficacy, modified from some original items developed by Tsai and Tsai (2003). Internet self-efficacy indicated self-perceived confidence in using the Internet. It was believed here that Internet self-efficacy should be regarded as a part of attitudes toward the Internet. Through a series of exploratory factor analyses, the 9 items were divided into two factors (subscales); the first one addressed adolescents' Internet self-efficacy in general (5-item general self-efficacy subscale), while the second probed their efficacy for Internet-based communication or interaction (4-item communicative self-efficacy subscale). The following are two items from the subscales: "I think I know how to use a Web browser like Internet Explorer or Netscape Navigator," and "I think I can talk to others in online chatrooms." These items also used a 6-point Likert scale, ranging from "very confident" to "very unconfident." The reliability coefficients for these two subscales were .84 and .78.

Students' questionnaire responses representing their perceptions and attitudes toward the Internet were scored as follows. A "strongly agree" (or "very confident") response was assigned a score of 6 and a "strongly disagree" (or "very unconfident") response was assigned a score of 1, while items stated in an opposite way were scored in a reverse manner. The average score of the items in a subscale was calculated to represent the adolescent's views; the gender differences on the perceptions and each subscale of the attitudes were then explored.

## RESULTS

### *Gender Differences in Perceptions*

Table 1 presents gender differences on perceptions of the Internet. By analyzing the responses on the first four items, it was revealed that male and female adolescents' scores showed a statistical difference on all four items. On the items of perceiving the Internet as technology, tool, and tour, females scored significantly higher than did males. However, on the toy item, males expressed more agreement than did females; that is, females considered the Internet as a technology or a (traveling) tool, but males tended to consider the Internet more as a

toy. This finding may indicate that females held more pragmatic views of the Internet, and males believed that they could acquire more pleasure and enjoyment from it.

### *Gender Differences in Attitudes*

As shown in Table 2, males' scores were significantly higher than those of females on the subscales of perceived usefulness and perceived control. These findings suggest that males tended to highlight the value of using the Internet as well as to display their ability to use it. However, on the subscales of affection and behavior, both males and females displayed statistically similar responses. Many studies have noted that female adolescents (or college students) felt higher anxiety and lower confidence when using the Internet. They also expressed more negative attitudes toward computers and the Internet (e.g. Durn-dell & Haag, 2002; Kadijevich, 2000; Tsai et al., 2001; Whitley, 1997). The present study revealed a somewhat different finding in which females did not differ from their male counterparts for the affection and behavior aspects of using the Internet. One possible interpretation may be that female adolescents now have more experience in using the Internet. Tsai et al. (2001) noted that as adolescents have more Internet experience, they tend to have more positive feelings, lower anxiety, and higher confidence in using it. The findings in the behavior subscale of this study further strengthened this interpretation. The adolescents in this study did not show a significant difference in the behavior subscale, suggesting that both males and females had similar opportunities to use the Internet. This finding concurs with that of Schumacher and Morahan-Martin (2001)—that gender differences in computer experience and skill levels have progressively diminished.

In addition, combining the data presented previously, it was proposed that although males and females expressed similar behaviors in using the Internet, males tended to use it as a toy, while females tended to use it simply as a tool or technology for traveling or navigation.

On the Internet self-efficacy subscales (i.e., general self-efficacy and communicative self-efficacy), female adolescents attained higher scores than did male adolescents (i.e., females expressed higher confidence in using the Internet for general or communication purposes than did male adolescents). This finding may contradict the stereotype that females often have less confidence in using technology such as computers and the Internet than do males (e.g., Colley & Comber, 2003; Postmes & Spears, 2002; Weinman & Haag, 1999). One plausible explana-

Table 1

## Perceptions of the Internet, by Gender

	Male		Female		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Technology	5.30	.87	5.57	.55	-4.77***
Tool	5.35	.79	5.59	.60	-4.34***
Toy	4.54	1.09	4.32	1.22	2.40*
Tour	4.41	1.13	4.80	1.11	-4.35***

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 2

## Attitudes Toward the Internet, by Gender

	Male		Female		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Perceived usefulness	5.20	.54	5.00	.83	3.64***
Affection	5.04	.73	5.12	.72	-1.36
Perceived control	3.73	.82	3.57	.95	2.23*
Behavior	4.48	.77	4.45	.84	.45
General self-efficacy	5.28	.76	5.40	.74	-2.06*
Communicative self-efficacy	4.90	.94	5.08	.92	-2.33*

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

tion of this finding may stem from the possibility that males tended to compare their ability and confidence in using the Internet with male peers who may have been more experienced in using the Internet. On the other hand, females probably compared their confidence in the use of the Internet based on that of their female peers who had the same amount of experience. Consequently, they may have perceived themselves as relatively competent in using the Internet. In general, the female adolescents attained higher scores on two self-efficacy subscales. Moreover, as suggested previously, increasing experiences of using the Internet may help females achieve better Internet self-efficacy.

#### DISCUSSIONS AND CONCLUSION

This study explored gender differences among 636 Taiwanese adolescents' perceptions and attitudes regarding the Internet. Concerning perceptions of the Internet, the findings of this study were similar to those of Colley (2003) concerning adolescents' perceptions of computers. Females tended to approach the Internet as a tool or a technology to accomplish a task, while males highlighted its use as a toy. This finding may be related to the fact that the features of on-line games are designed mainly for males.

Female adolescents have often been considered to be disadvantaged in using technology-related equipment since they have had fewer opportunities to do so. However, this study yielded a somewhat different result—that females manifested no significant differences from males on the affection and behavior subscales; that is, females now indicate more positive affective response and frequencies in using the Internet than they did in the past.

Furthermore, as a previously unexplored factor, the present study investigated adolescents' attitudes toward the Internet by adding two subscales to explore adolescents' Internet self-efficacy. It was surprising to find that females tended to attain higher Internet self-efficacy than did males. This finding may conflict with the gender stereotype in the use of technology. As noted previously, this result may be due to the male to male and female to female comparisons. In addition, the gender stereotype, might explain the surprising results. As part of the stereotype, it is expected that males *should* perform better in technology-related tasks; thus expectations for the use of technology are higher. As a result, they may often be dissatisfied with their ability to use the Internet. This can result in a relatively low Internet self-effi-



cacy. On the other hand, the expectations for females is not as high for performing technology-related tasks. However, as suggested by Durndell and Haag (2002) increased experience can result in greater self-efficacy. Also, the lower expectations for females in using technology or the Internet may result in their being more satisfied with their current status of performance. Thus, females have higher Internet self-efficacy than do males, as found in this study.

In conclusion, this study found that males expressed more positive Internet attitudes than did females on the perceived usefulness and perceived control of the Internet. Nevertheless, no significant difference was found in the affection and behavior aspects of using the Internet between genders. More importantly, females tended to express higher Internet self-efficacy than did males. Gender differences regarding the Internet are expected to gradually narrow because female adolescents can now acquire more experience in using the Internet than they did in the past.

Future research might explore gender differences regarding Internet perceptions and attitudes by age and culture, and possible ways of reducing gender differences should be examined.

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