



## A preliminary study of college room-bound male students: Concept exploration and instrument development

Chien Chou<sup>a,\*</sup>, Huan-Chueh Wu<sup>a</sup>, Mei-Hung Wang<sup>b</sup>

<sup>a</sup> Institute of Education, National Chiao Tung University, 1001 Ta-Hsueh Rd, Hsinchu 30010, Taiwan, ROC

<sup>b</sup> Center for General Education, National Chiao Tung University, 1001 Ta-Hsueh Rd, Hsinchu 30010, Taiwan, ROC

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### ABSTRACT

From time to time, cases of over-dependence on the Internet have been observed on college campuses. Some students, especially male students, remain connected to the Internet as long as they are awake. In Chinese, the emerging term 宅男 (chai-nan) is used to describe this kind of young man, meaning “room-bound male,” who seldom leaves his residence and stays online with few interruptions. Thus far, the term ‘room-bound male’ has become a popular component of Taiwan students’ slang, society’s common conceptions of technology-savvy youths, and media coverage of these youths, but how people, especially college students, exactly perceive room-bound males is still unclear.

The purposes of this study are to explore this emerging concept and possible underlying dimensions of room-bound males in the college-campus context, to examine college students’ perception of this concept, and to construct an instrument—the Image of the Room-bound Male Scale (IRBMS)—for measuring these dimensions. Based on an exploratory factor analysis of 533 valid responses, the results indicate that respondents expressed significantly stronger agreement with the described dimensions of computer activities, social life, and eating habits than with the described dimensions of adult hobbies, clothing styles, and computer use. The results also indicate that female students were in stronger agreement with the statements regarding all six IRBMS dimensions than were male students; and that freshmen and sophomores were in stronger agreement with the statements regarding the dimensions of computer hobbies, social life, and eating habits as well as with the overall IRBMS than were juniors and seniors. Respondents who evaluated themselves as non-room-bound were in greater agreement with the descriptions of the adult-hobbies dimension than were respondents who evaluated themselves as room-bound. Interpretations of these results, future research directions, and implications for educators are discussed.

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### 1. Introduction

With the rapid development and the growing popularity of network technology, college students around the world—including those in Taiwan—now have easy access to the Internet and use a variety of network applications in their learning and daily lives. It seems that the Internet is not only an information superhighway, but also a new interpersonal arena in which young people can enhance their knowledge, opportunities, and social experiences.

Indeed, it is clear that the Internet has become an important aspect of campus daily life, and college students have more access to and make greater use of the Internet than any other generation (Lloyd, Dean, & Cooper, 2007). However, from time to time, cases of over-dependence on the Internet have been observed on campus. Some students, especially male students, remain connected to the Internet as long as they are awake (Chou & Hsiao, 2000; Sharpira et al., 2003). Harnessing the Internet’s communications and social-networking tools, these students can accomplish many, if not most, of their academic and daily-life tasks (e.g., interacting with professors, chatting with friends, doing homework, playing games, watching movies, ordering pizzas). With the exception of going to the bathroom and occasionally attending classes, these students seem to stay planted in front of their computers in their residence hall all day long. Therefore, these college students seem to follow a life style different from that of most college students.

\* Corresponding author. Tel.: + 886 3 5731808; fax: +886 3 5738083.

E-mail address: [cchou@mail.nctu.edu.tw](mailto:cchou@mail.nctu.edu.tw) (C. Chou).

What do college students, especially male students, do with the Internet on campus? Past research (e.g., Bressers & Bergen, 2002; Jones, Johnson-Tale, Millermaier, & Pérez, 2009) has shown that male students have used the Internet more for entertainment purposes (e.g., checking sports scores, playing games, watching videos) and have had more access to adult-type information than their female counterparts. Although both male and female college students considered Internet use to be substitutable in some cases for social interaction, male students were more likely to conclude that the Internet takes time away from their other social activities (Jones, Johnson-Yale, Millermaier, & Pérez, 2009). Some studies have also shown that, overall, male college students spend a considerably greater amount of time on the Internet than female students (Anderson, 2001; Bressers & Bergen, 2002), and are more likely to stay online overnight than female students (Jones et al., 2009). It seems clear that, in general, the Internet-use patterns of male college students may differ from those of female college students regarding the purposes of Internet use, Internet activities, content/information viewed online, time spent online, and so on. However, it is not so clear whether there exists a subset of college male students who live in, and seldom leave, their dormitory room in order to connect themselves to the Internet all day long. If such a subset exists, then we would like to know more about what these male students are doing online, how they live their daily lives, and whether other factors (e.g., gender and grade-level) make any differences therein. Such knowing would help educators more adequately and adaptively guide these male students to a better college life.

In Chinese, we already have the emerging term 宅男 (chai-nan) to describe this kind of young man, meaning “room-bound male” (RBM), who seldom leaves his residence and stays online with few interruptions. Thus far, the term ‘room-bound male’ has become a popular component of Taiwan students’ slang, society’s common conceptions of technology-savvy youths, and media coverage of these youths, but how people, especially college students, exactly perceive room-bound males is still unclear. Bennett, Maton, and Kervin (2008) recently argued that much of the current debate about the term ‘digital natives’ (i.e., young people who spend their entire lives surrounded by all kinds of digital toys and tools) represents an academic form of “moral panic” and that episodes of moral panic are often couched in the dramatic language of news media; in turn, these researchers suggested that society would greatly benefit from a more measured and disinterested approach to investigating both “digital natives” and their implications for education. Much the same scenario applies to the term ‘room-bound male’. Without a clear picture of the room-bound male or a valid instrument to measure people’s perception of him, it is difficult to further investigate these males’ prevalence, their lifestyle, or any other social-psychological factors that might be causes or consequences of the phenomenon.

The goals of this study, therefore, are to explore the concept and underlying dimensions of the room-bound male in the context of Taiwanese college campuses, to examine college students’ perception of this concept, and to construct an instrument—the Image of the Room-bound Male Scale (IRBMS)—for measuring these dimensions. It is worth noting that although the “room-bound” phenomenon may also occur with female college students, the term ‘room-bound female’ is relatively less obvious or popular in the lingo of Taiwanese youth and young adults. Therefore, the present study is focused only on male college students.

## 2. Literature review

### 2.1. Terminology and concepts related to the room-bound male

The Chinese term for room-bound male—宅男 (chai-nan)—originally derives from the Japanese slang term おたく (otaku), which refers to young people who are obsessed with sub-culture activities such as reading comics or playing computer games and who might stay home almost all the time (Wiki, 2010). Chai-nan is a relatively new term and its definition could not be found in any printed/published dictionary—only in Wiki. It is interesting to note that, somewhat reflective of the Internet-based nature of chai-nan, Wiki is an application of socially collaborative meaning construction that is distinguishable for its mutability. Therefore, the definition of ‘chai-nan’ from Wiki can provide us a basic understanding and a starting point for further investigation.

In English, similar terms might be ‘nerd’, ‘geek’, or ‘anorak’, some of which have conventionally described a person who passionately pursues intellectual activities, esoteric knowledge, or other obscure interests rather than social or popular activities (Merriam-Webster Dictionary, 2010) and which, more recently, have described a person who passionately pursues such activities as they relate to cutting-edge technology and sub-culture activities. It is worth noting that these stereotypes usually have a negative connotation. However, whether or not ‘chai-nan’, the Chinese term for room-bound males, is a relatively *negative* description of a certain group of men remains unclear and merits further study.

In English, the term ‘cocoon’ surfaced in past literature to describe the environment surrounding people who spend their lives being (over)engaged in a certain technology. For example, Treuer and Belote (1997) have expressed their concern about “cocooning,” in which people withdraw from social environments and use technology to avoid direct interaction with peers, thereby perhaps impeding psychological development. For college students, the concept of cocooning can refer to students who retreat to their computers (or more specifically, the Internet) and isolate themselves from campus activities. Therefore, the terms ‘room-bound’ and ‘cocoon’ seem to share a certain connotation to some degree.

### 2.2. Students’ Internet use, health, and lifestyle

Because this study focuses only on the relationship between technology use and a particular life style, some past related studies are reviewed here. Ho and Lee (2001) discussed the lifestyles of Hong Kong computer-using adolescents (who would have been in grades 7, 9, and 11 in the US system). The main findings indicate that the boys who were playing computer games tended to lead a more sedentary lifestyle than their girl counterparts; the boys exhibited lower levels of physical activities, of relaxation activities (other than computer games), and of self-perceived social support.

Also focusing on Asian adolescents, Kim et al. (2010) placed 853 South Korean junior high school students (7th–9th graders) into one of three groups: high-risk Internet users, potential-risk Internet users, and no-risk Internet users. The results show that the high-risk Internet students tended to eat smaller meals, to have a smaller appetite, to skip more meals, and to snack more than the potential-risk and no-risk groups. Further, the results indicate that the high-risk group’s average diet quality was poorer than the diet quality attributable to the potential-risk group and the no-risk group. The researchers found, as well, that the high-risk group reported greater irregularity in sleep patterns and more episodes of sleep disturbance than the no-risk Internet group.

Lloyd et al. (2007) discussed the relationship between US college students' Internet use and their placement on the Salubrious Lifestyle Scale (measuring the degree to which a student's lifestyle is consistent with or promotes good health and wellness practices). It was found that the scale scores were significantly negative when correlated to using Gameboy, to watching TV, and to watching DVDs. The researchers concluded that students' high levels of technology use for entertainment purposes was associated with a less healthy lifestyle overall.

### 2.3. Male college students' Internet use

Because the current study focuses on male college students, especially those who are heavy Internet-users, we should review several related studies to enhance our understanding of the research subject. As suggested in past research (e.g., Cotten, 2008), almost all college students, at least in the United States, have either owned or had access to computers and the Internet, and have been able to use a variety of Internet applications in their daily lives. College students in Taiwan exhibit similar characteristics (Chou, Wu, & Chen, 2011).

What do male college students do while they are online? There seem to be few related studies focusing on only male students; moreover, many past studies have conducted male-female comparisons to examine possible gender differences in Internet use on college campuses. These studies could prove helpful in answering the current studies' questions. Jackson, Ervin, Gardner, and Schmitt (2001) stated that college male and female students "used the Internet equally often, but used it differently" (p. 374). These researchers concluded that, in general, male students might be more information- or task-oriented but less interpersonally oriented than female students. Of the many kinds of online information and online tasks, the most popular are entertainment-related. Whitty and McLaughlin's study (2007) posited that college students use the recreational Internet not only for computer-based entertainment, but also for facilitating offline entertainment and for information about the entertainment world. Bressers and Bergen (2002) suggested that male students are more likely to use the Internet for games and sports than are female students. Fortson, Scotti, Chen, Malone, and Del Ben's (2007) study argued that male college students are more likely to use the Internet as a source of entertainment than are female students. Jones et al. (2009) presented similar findings: 42% of male college students reported that entertainment was their most frequent type of Internet use. In this study, 62% of male college students reported listening to music or watching videos online at least once per week, compared to 46% of female students; 37% of male students downloaded music at least once per week, compared to 20% of female students.

An interesting disparity becomes apparent when examining adult-type online content as visited by males and females. Bressers and Bergen (2002) reported that male college students were more likely to use the Internet for adult content than were female college students. In a study conducted by Jones et al. (2009), 53% of male college students reported visiting an adult site at least once a week, while only 9% of female college students had done so. In fact, gender difference in this specific information domain seems to go beyond the college level. In Helsper (2010), males across generations (14 years old to 75 + years old) and across occupations are more likely to look for online sexual materials than were females.

Regarding the time spent on the Internet, past research (e.g., Anderson, 2001; Jones 2009) demonstrates that, overall, male college students spend a considerably greater amount of time using the Internet than female college students. Jones et al. (2009) pointed out that, although a majority of college students reported going online many times throughout the day, male college students are more likely to be online overnight than were female college students (15% vs. 3%). Past literature on problematic use of the Internet (e.g., Chou, Condron, & Belland, 2005) points out that prolonged Internet use and deprivation of sleep caused by Internet use are two important Internet-addiction symptoms. This is probably also why male Internet addicts usually outnumber female ones in many studies (e.g., Morahan-Marín & Schumacher, 2000).

### 2.4. College students' Internet use in the dormitory context

A final point addressed in the literature review concerns the place where college students use the Internet, in particular, Internet use in the residence or dormitory. As Jones (2002) stated, US undergraduate college students have traditionally lived in an on-campus residence hall, apartment, or fraternity or sorority house. However, many college students take their residence off-campus for various reasons. Regardless of whether students live on or off campus, an observable trend is that students prefer to use their own computers, in private, rather than computers in public places such as campus computer labs. In fact, as most college students today are experienced Internet users, own their own personal computers, and use the Internet for a variety of purposes beyond academics, they may highly value their privacy when using computers or the Internet. Jones reported that students tended not to spend a great deal of time in campus labs; they usually made quick checks of messages or emails between classes, and some students "would not even sit down" or "took off their coats or backpacks" while attending to the Internet communications (p. 14). Lohnes and Kinzer (2007) discussed students' use of their computers in dorms and noted that laptop use was either highly useful or even necessary for participating in social spaces and for circulating interesting Web sites or humorous videos. Although exceptional, a few students were observed eating their dinner alone in the dormitory kitchen while having their computers just to the side of the food so that the students could surf the Web or play games while eating.

It is worth noting that a key concept emerging from these studies is "multitasking," which characterizes students' use of the Internet in their campus residence. As Jones (2002) pointed out, today's college students have had long experience with multitasking even before the Internet had integrated itself into their lives (e.g., simultaneously watching TV, chatting with friends, and reading books/magazines). Matthews and Schrum's study (2003) involved a series of focus-group interviews with undergraduates concerning their Internet use and academic gratification in college residences. The researchers' findings indicate that undergraduate students were generally concerned about their personal control over Internet use in relation to their time management. In particular, interviewed students expressed being out of control while instant messaging (IM) distracted them from their academic work, and thus, these distractions may negatively affect students' academic success.

Despite the Internet's potential negative influence on students' academic work, students who are over-engaged in the Internet may also be more vulnerable to Internet addiction in dormitory contexts. Young (1998) identified some contributing factors to such Internet overuse, including free and unlimited Internet access, huge blocks of unstructured time, new freedom from parental supervision, the desire to escape college stressors, social intimidation and alienation, and so on. These factors may also underlie the current condition of students' Internet use in Taiwan dormitories. Lin et al. (2004) stated that, in a free-of-charge or flat-rate Internet-access environment, such as the dormitories on Taiwan campuses, users often abuse or use the Internet unfairly. Their study proposed a new control policy based on an innovative service architecture to tackle this problem in a major university in Taiwan, and the effectiveness of the policy was evaluated and reported. As

in Lin's case, most of the Taiwanese students had left their home and familiar peers for the first time to enter colleges, where the students were facing greater academic challenges and changing responsibilities, but at the same time were granted greater freedom from parental control. Technology, especially the Internet, serves as a powerful agent for their adjustment to such new physical and social environments. When colleges provide unlimited Internet access campus-wide and promote the integration of the Internet into classroom teaching and classroom learning, educators probably would not appreciate that a few, if not many, students would ground themselves in their own dormitory and would be connected to the Internet all day long.

### 2.5. Learning from past studies and exploring the current study's research questions

This brief literature review provides a foundation for understanding how the Internet has fully permeated and deeply affected college students' lives. In general, although there already exists some related research, as reviewed above, the concept and the possible underlying dimensions of the room-bound male have not yet received a clear, comprehensive treatment in the literature. In addition, although the term is widely used on college campuses, there is little to no empirical research on the specific lifestyles associated with the RBM. Therefore, the present study may contribute to the lack of research. In specific, past studies have shed light on the following themes.

- (1) There is neither empirical evidence nor theoretical grounds for asserting that cocooned or room-bound people—by definition—are entirely isolated from social interactions, lack social support, or are necessarily lonely: the lifestyle may decrease these people's direct face-to-face interactions with others, but the people in question can use technology (e.g., the Internet) as substitutes for preserving or even expanding their interpersonal relationships. Therefore, whether or not room-bound male students use the Internet or other computer-mediated communication to form their social life is one of the focuses of the present study. In other words, the current study explores social life as one possible underlying dimension of the students' perception of RBM.
- (2) Having reviewed the past research on relationships among students' Internet use, health, and lifestyle, we may propose that, for middle school or college students, greater use of the Internet (for games) may lead to a less healthy lifestyle (e.g., less physical activity, lower-quality diets, and greater irregularities in sleep patterns). Thus, how room-bound male students live their daily lives is a research focus of this study. By exploring college students' perceptions of RBMs regarding these various dimensions, we can draw a more holistic picture of the RBM on campus. Therefore, based on the above two research focuses we propose the first two research questions:

R1: What underlying dimensions underlie college students' perceptions of room-bound males?

R2: What are college students' general perceptions of room-bound males on campus?

- (3) When comparing male students' Internet use with female students' Internet use, past literature has suggested that to some degree, male students are different from female students in terms of the total time spent online, the periods of time spent online, the type of information accessed, and the purpose of the Internet use. Therefore, whether male or female respondents have different perception of room-bound males becomes one of the research focuses. On the basis of this research focus, we propose the following research question:

R3: Does gender make any difference in the total perception and respective dimensions of room-bound males?

- (4) Reviewing the past studies on dormitory Internet use, we consider whether technology in general—and the Internet in particular—can help college students, especially younger ones, adjust to college life. In other words, the current study explores whether college-level younger students differ from college-level older students regarding patterns of dormitory Internet use. In this regard, we propose the following research question:

R4: Does grade-level make any difference in overall perception of or the respective dimensions of room-bound males?

- (5) In this study, we asked students to evaluate their fellow students (see below for a discussion of our research approach), and we asked these "evaluating" students whether they would characterize themselves as "room-bound" (RB). So we would like to know whether there is any difference between the evaluations of evaluating students who characterize themselves as RB and the evaluations of evaluating students who do not characterize themselves as RB. We propose the following research question:

R5: Does self-evaluation make any difference in the evaluators' overall perception of room-bound males and the evaluators' perception of the dimensions of room-bound males?

### 2.6. The research approach and the significance of the present study

It is important to note that, because of the exploratory nature of the present study, and the lack of both theoretical foundations and directly related past studies, we have adopted a research approach here targeting perceptions that college students have of their fellow students. This approach is only a very first step toward the practical application of for college student affairs and direction for further research. Nevertheless, this first step seems a necessary one in the direction of rigorously fleshing out the social concept of the room-bound male: without such concept exploration and scale development, we can hardly identify any corresponding implications for researchers and for students' parents, nor can student-affairs administrators offer students effective evidence-based guidance to enrich their college lives.

## 3. Materials and methods

### 3.1. Subjects and the distribution process

For this exploratory study, we used the paper-and-pencil survey method to collect data from four colleges and universities in northern, central, and southern Taiwan. In sum, 533 sets of valid data were collected. Of all the responding students, 188 (35.27%) were female, 344 (64.54%) were male, and 1 (1.9%) was missing; 131 (24.58%) were freshmen, 136 (25.52%) were sophomores, 137 (25.70%) were juniors, 83

(15.57%) were seniors, and the remaining 46 (8.63%) were graduate students. Of the 494 respondents who responded to the self-evaluation statements regarding the degree to which they were “room-bound,” 156 (31.57%) evaluated themselves as “room-bound” while 338 (68.42%) did not. The average amount of time that the respondents would spend on the Internet was 4.77 h (SD = 3.32) per weekday and 5.85 h (SD = 4.00) per weekend day.

### 3.2. Instrument

The Image of the Room-bound Male Scale (IRBMS) had three major sections. The first section explained the purpose of the study and introduced the terms ‘room-bound’ and ‘room-bound male,’ and reminded the respondents to base each response on their own perception of RBMs on campus.

The second section rested on the IRBMS. Since there was neither an existing theoretical foundation nor any related scale to which we could refer, and since the nature of this study is exploratory, we developed statements on the basis of the above-mentioned literature, supplemented by mass-media coverage, Internet Bulletin Board Systems, Wikipedia, researchers’ observations over three consecutive years, and deep interviews with ten college students and faculty members. The original IRBMS ended up comprising 55 statements with no opposite-scaled items in seven proposed dimensions:

- (1) Eating habits: This dimension emphasizes type of food, eating habits, and possible multitasking of eating and of doing computer activities. An example item is “They usually eat their meals in front of the computer screen.”
- (2) Appearance: This dimension was not mentioned in any literature and, thus, stems mainly from researchers’ observations and speculations as to whether there was a “dress code” in the targeted population. The dimension focuses on male students’ clothing styles. An example item is “They usually wear a loose-fitting t-shirt.”
- (3) Computer game: This dimension explores the types of games played by the targeted population and emphasizes their knowledge of the games. An example item is “They like to play online games in general.”
- (4) Interests/hobbies: This dimension takes its essence from the original meaning proposed by Otaku and explores the targeted population’s interests/hobbies other than computer games. An example item is “They often read comics.”
- (5) Computer use: This dimension focuses on male students’ computer/Internet-related knowledge and skills, and includes the item “They download and upload computer files very often.”
- (6) Interpersonal relationship: This dimension focuses on male students’ preferences regarding computer-mediated communication, cyber social spaces, and so on. An example item is “They prefer Internet-mediated communication to face-to-face communication.”
- (7) Daily life: This dimension emphasizes sedentary lifestyles and includes the item “When not sleeping, they just sit in front of computers.”

It is worth noting that this study is of an exploratory nature and has served to describe the RBM from the perspectives of both male college students and female college students, but not to differentiate the RBM students from non-RBM students. In addition, as the current study is a pioneering effort to craft a rigorous, compelling concept of the RBM, there was no previous literature from which we could conclude or infer whether or not connotations surrounding RBMs are negative or carry a “social stigma.” Thus, we had no way of determining with any certainty whether—in a situation where we would ask respondents to self-evaluate—the topic of RBMs might trigger among respondents an internal state awareness, or a self-reflectiveness (see also Reeves, Watson, Ramsey, & Morris, 1995). And thus, we basically adopted an “evaluate-others” rather than an “evaluate-the-self” approach to avoid respondents’ possible “social desirability” bias; in other words, our selected approach strengthened the likelihood that we could circumvent respondents’ possible tendency of under-reporting their own agreement with possibly negative RBM statements. Thus, all statements were in the third-person format (e.g., “They [RBMs] are not good at communicating with others in real life”) instead of in the first-person format (e.g., “I am not good at communicating with others in real life”). All anonymous respondents in an informed-consent condition were instructed to express their degree of agreement with lifestyle-related statements in regard only to room-bound males, not to general male students in the college-campus context.

In addition to the above 55 statements, the IRBMS includes Statement 56 (“The term ‘room-bound male’ has a negative connotation”), which helps us assess respondents’ general attitudes toward this term. The respondents were required to read the statements and to indicate the extent of their agreement with the statements on the basis of the options provided on a 4-point Likert scale: strongly agree, agree, disagree, and strongly disagree (counted as 4, 3, 2, and 1, respectively). Thus, a higher score indicates stronger agreement with a given statement regarding room-bound males.

The third section asked students questions regarding demographic information (gender and grade-level), Internet use, and whether they were “room-bound.”

## 4. Results

### 4.1. Factor structure of the IRBMS constructs

Although a total of 55 statements were initially developed in seven dimensions, those statements might not represent a factor structure or assumptions that are valid or reliable. Therefore, we used exploratory factor analysis (EFA) in this early exploratory stage of instrument development (Jöreskog & Sörbom, 1993) to re-categorize these statements into distinct factors (dimensions), to determine the number of factors, and to ensure IRBMS construct validity. Principal component analysis with varimax rotation was conducted with an eigenvalue higher than 1. A statement would be deleted if its factor loading was lower than 0.3. If a statement contributed to at least two factors and the difference between the two factors was lower than 0.3, this statement would be deleted.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was measured as 0.93, which suggests that the statements were very suitable for factor analysis (Kaiser, 1974). The EFA results indicated a six-factor structure, and a total of 31 statements were kept. The total explained variance was 71.37% in relation to these six factors. Table 1 shows the factor loadings of the 31 statements relative to the six factors on the IRBMS.

**Table 1**  
Factor loadings of the 31 statements of the six factors on the IRBMS.

Item statement	Computer activities	Social life	Eating habits	Computer use	Adult hobbies	Clothing styles
19. They often play online role-playing games.	0.79					
17. They like to play online games in general.	0.77					
21. They often read comics.	0.73					
22. They often watch computer animation.	0.72					
20. They usually play more than two online games at the same time.	0.71					
16. When the Internet is not available, they like to play stand-alone computer games.	0.68					
18. They often play multi-user online games.	0.68					
25. They can easily talk about the content of more than 10 TV dramas, movies, or comics on the Internet.	0.63					
36. They are not good at communicating with others in real life.		0.79				
40. They prefer Internet-mediated communication to face-to-face communication.		0.79				
38. Their primary social space is the Internet, not physical space.		0.78				
39. They usually have a hard time expressing themselves in face-to-face environments.		0.77				
41. They prefer staying at home or in a room to going out.	0.30	0.71				
42. They usually don't go out on evenings or weekends.		0.68	0.33			
37. When chatting with others, they usually talk about their own interests.		0.67				
3. They usually eat foods from convenience stores.			0.82			
1. They usually eat their meals in front of the computer screen.			0.79			
4. They usually eat late-night snacks in front of the computer screen.			0.77			
6. They like to eat micro-waved food in front of the computer screen.			0.76			
2. They like to eat "instant noodles" in front of the computer screen.	0.33		0.74			
5. They like to eat prepared foods in front of the computer screen.			0.72			
33. They can assemble computers.				0.88		
34. They often help fix other peoples' computer problems.				0.87		
35. They are very familiar with many electronic products/devices other than computers.				0.85		
32. They are very knowledgeable about computer/Internet use.				0.81		
49. They collect a lot of pornographic movies on their computers.					0.89	
47. They collect a lot of pictures of naked women on their computers.					0.87	
48. They collect a lot of files of adult comics on their computers.					0.85	
7. They usually wear their department t-shirt.						0.80
8. They usually wear a loose-fitting t-shirt.						0.77
9. When they leave their room, they like to have on sportswear.						0.71
Alpha value	0.92	0.91	0.92	0.90	0.93	0.80
Variance explained (%)	16.22	15.19	14.28	10.33	8.40	6.96
Total items = 31; KMO = 0.93; Cronbach's $\alpha$ = 0.94; Total variance explained = 71.37%						

In regard to the inter-correlation of statements, the reliability coefficient of the Cronbach's alpha was used for estimating the internal consistency of IRBMS statements and for measuring the extent to which statements' responses that were obtained at the same time correlated highly with each other. The total 31-statement scale had an excellent internal consistency reliability of 0.94. As shown in Table 1, the reliability of each factor was as follows: Computer activities, 0.92; Social life, 0.91; Eating habits, 0.92; Computer use, 0.90; Adult hobbies, 0.93; and Clothing styles, 0.80. The rules of thumb for the Cronbach's alpha coefficient were suggested by George and Mallery (2003): alpha > 0.9 (Excellent); and alpha > 0.8 (Good). In short, the EFA and the Cronbach's alpha analysis show that the constructed IRBMS is a scale with more than decent validity and internal consistency reliability.

#### 4.2. Students' general perceptions of the "room-bound male"

In order to investigate the respondents' overall perceptions of the "room-bound male" and whether gender, grade, and self-evaluation account for differences in their perceptions of the room-bound male, we categorized the 31 statements into six dimensions (as shown in Table 1). In order to calculate and then compare respondents' mean scores for each dimension, we added the respondents' original scores to the given dimension's statements (4, 3, 2, and 1) and then divided this sum by the number of statements. The appendix lists the mean and standard deviation for each statement.

As Table 2 shows, the six dimensions' respective mean scores range from 2.56 to 3.02 (SD range from 0.74 to 0.89), and the mean score of Statement 56 is 2.64 (SD = 0.89). As presented in Table 2, the results reveal that Hottelling's Trace was significant ( $F = 32.77, p < 0.001$ ). A Schaffe post-hoc test further reveals that the mean scores of Computer activities, Social life, and Eating habits are significantly greater than the mean scores of Computer use, Adult hobbies, and Clothing styles; the mean scores of Adult hobbies and Clothing styles are significantly greater than the mean scores of Computer use.

#### 4.3. Gender difference in perceptions of the "room-bound male"

Since these six dimensions are the subscales of the IRBMS, we conducted a multivariate analysis of variance (MANOVA) to compare the gender differences among college students who were respondents in our study on their perceptions of the "room-bound male." The results

**Table 2**Results of the paired sample one-way ANOVA and of the post-hoc test of the IRBMS factors ( $n = 533$ ).

Subscale	Mean	SD	F value (Hotelling's Trace)	Summary of significant differences of paired samples in the Schaffe post-hoc test
Computer activities	2.98	0.79	32.77 ***	Computer activities, Social life, Eating habits > Adult hobbies, Clothing styles > Computer use
Social life	3.02	0.74		
Eating habits	2.96	0.82		
Computer use	2.56	0.82		
Adult hobbies	2.71	0.89		
Clothing styles	2.75	0.87		

\*\*\* $p < 0.001$ .

reveal that Hotelling's Trace was significant ( $F = 7.00$ ,  $p < 0.001$ ). Table 3 illustrates that gender differences characterized the six dimensions' mean scores: (Computer activities,  $F = 27.40$ ,  $p < 0.001$ ,  $\eta^2 = 0.049$ ; Social life,  $F = 12.40$ ,  $p < 0.001$ ,  $\eta^2 = 0.023$ ; Eating habits,  $F = 14.84$ ,  $p < 0.001$ ,  $\eta^2 = 0.027$ ; Computer use,  $F = 5.09$ ,  $p < 0.05$ ,  $\eta^2 = 0.010$ ; Adult hobbies,  $F = 7.84$ ,  $p < 0.01$ ,  $\eta^2 = 0.015$ ; Clothing styles,  $F = 32.55$ ,  $p < 0.001$ ,  $\eta^2 = 0.058$ ). The overall mean scores of the IRBMS were  $F = 31.00$ ,  $p < 0.001$ ,  $\eta^2 = 0.055$ . Further, Schaffe post-hoc statistical tests reveal that the female students tended to be in greater agreement with the statements regarding both the overall IRBMS and each dimension than were the male students.

#### 4.4. Grade-level difference in the perceptions of the "room-bound male"

We conducted a MANOVA to explore the grade-level differences in college students' perceptions of the "room-bound male." The results show that Hotelling's Trace was significant ( $F = 3.70$ ,  $p < 0.001$ ). As shown in Table 4, significant grade-level differences existed in some of the dimensions. Analysis further shows that freshmen and sophomores were in greater agreement with the statements regarding the IRBMS dimensions of Computer activities ( $F = 13.53$ ,  $p < 0.001$ ,  $\eta^2 = 0.026$ ), Social life ( $F = 8.95$ ,  $p < 0.01$ ,  $\eta^2 = 0.017$ ), and Eating habits ( $F = 7.17$ ,  $p < 0.01$ ,  $\eta^2 = 0.016$ ), and the overall IRBMS ( $F = 9.46$ ,  $p < 0.01$ ,  $\eta^2 = 0.018$ ) than were juniors and seniors.

#### 4.5. Self-evaluation differences in college students' perceptions of the "room-bound male"

In order to examine whether college students' self-evaluations made any difference in these same students' perceptions of the "room-bound male," we conducted a MANOVA. The results show that Hotelling's Trace was insignificant ( $F = 1.98$ ,  $p > 0.05$ ). As Table 5 shows, we found a significant difference between self-evaluated RB and self-evaluated non-RB in regard only to the dimension of Adult hobbies ( $F = 6.31$ ,  $p < 0.05$ ,  $\eta^2 = 0.013$ ). This finding means that respondents who evaluated themselves as not being RB tended to be in greater agreement with the statements in this one dimension than were the respondents who evaluated themselves as being RB.

## 5. Discussions

### 5.1. Underlying dimensions of the RBM

This study used the IRBMS to probe male and female college students' perception of the "room-bound male." In order to answer the first research question on possible dimensions underlying college students' perceptions of room-bound males, we constructed the initial 55 IRBMS statements in seven dimensions. The exploratory factor analysis left only 31 statements in six underlying dimensions (subscales): two address computers (Computer activities and Computer use), two address lifestyles (Eating habits and Clothing styles), one addresses interpersonal skills or communication (Social life), and one addresses interests/habits (Adult hobbies). The EFA helped explore these six subscales as latent dimensions that explain why the statements are correlated with each other, and the EFA provide additional evidence regarding the construct validity of the IRBMS.

### 5.2. College students' general perception of the RBM

Research question 2 explores the college students' general perceptions of the "room-bound male" on campus. The results indicate that, of the six dimensions' respective mean scores, the Social life dimension's mean score of 3.02 ( $SD = 0.74$ ) occupies a point between agree (3)

**Table 3**Means, standard deviations, and post-hoc ANOVA results for gender in the IRBMS ( $n = 532$ ).

	Male ( $n = 344$ )		Female ( $n = 188$ )		F	Post-hoc test
	Mean	SD	Mean	SD		
Computer activities	2.85	0.82	3.22	0.64	27.40***	F > M
Social life	2.93	0.78	3.17	0.65	12.40***	F > M
Eating habits	2.87	0.85	3.15	0.71	14.84***	F > M
Computer use	2.50	0.85	2.67	0.77	5.09*	F > M
Adult hobbies	2.63	0.93	2.86	0.80	7.84**	F > M
Clothing styles	2.60	0.90	3.04	0.72	32.55***	F > M
The overall IRBMS	2.78	0.60	3.07	0.50	31.00***	F > M

\* $p < 0.05$  \*\* $p < 0.01$  \*\*\* $p < 0.001$ .

**Table 4**  
Means, standard deviations, and MANOVA results for grade-level in the IRBMS ( $n = 487$ ).

	(1) Freshmen & Sophomores ( $n = 267$ )		(2) Juniors & Seniors ( $n = 220$ )		F	Post-hoc test
	Mean	SD	Mean	SD		
Computer hobbies	3.09	0.75	2.83	0.81	13.53***	(1) > (2)
Social life	3.12	0.75	2.91	0.72	8.95**	(1) > (2)
Eating habits	3.07	0.78	2.87	0.84	7.17**	(1) > (2)
Computer use	2.57	0.81	2.50	0.84	0.68	
Adult hobbies	2.73	0.93	2.66	0.87	0.61	
Clothing styles	2.74	0.85	2.77	0.91	0.10	
The overall IRBMS	2.96	0.58	2.79	0.58	9.46**	(1) > (2)

\*\* $p < 0.01$  \*\*\* $p < 0.001$ .

and strongly agree (4) (see Table 2). The other five dimensions' respective mean scores and the overall IRBMS mean scores are higher than the theoretical mean of 2.5 (between disagree and agree), and they range from 2.56 to 2.98. This result indicates that respondents averagely agreed with the descriptions of all the dimensions of the IRBMS, and that the highest agreement was with the statements concerning Social life whereas the lowest agreement was with the statements concerning Computer use. It is worth noting that the mean score attributable to Statement 56 ("The term 'room-bound male' has a negative connotation") is 2.64 ( $SD = 0.89$ ), meaning that, in general, respondents held a slightly negative impression of the term 'room-bound male'.

This study further investigates the differences among the six IRBMS subscales, and the results indicate (1) that the mean scores of Computer activities, Social life, and Eating habits are significantly greater than the mean scores of Computer use, Adult hobbies, and Clothing styles; and (2) that the mean scores of Adult hobbies and Clothing styles are significantly greater than the mean score of Computer use. These inequalities mean that, in terms of IRBM, our respondents—regardless of their gender and grade-level—generally were in greater agreement regarding the statements of Computer activities, Social life, and Eating habits than regarding the statements of Computer use, Adult hobbies, and Clothing styles. From respondents' perspective, RBM students generally liked to play multi-user or role-playing online games, watch computer animation, and were familiar with TV dramas, movies, or comics circulated on the Internet. Also from respondents' perspective, RBM students in their daily life preferred to stay in their room rather than go out, and if they needed to interact with others, they preferred Internet-mediated communication to face-to-face communication. Surveyed students perceived RBM students as usually eating their meals, such as instant noodles or any food from convenience stores, in front of a computer screen, and perceived the RBM students as doing so for time-saving reasons or out of a lack of care. It is interesting to note that many convenience stores, dining halls, food courts, or canteens on Taiwan campuses now provide delivery services to dormitories, so that resident students, including RBMs, can order food through the Internet or by phone rather than have to go out to dine.

The current study's findings indicate that the respondents generally agreed with the statements about Adult hobbies and Clothing styles in describing room-bound male college students. For example, there was a perception that RBM students might collect a large number of pictures of naked women, files of adult comics, or pornographic movies on their computers. With regard to their appearance, RBM students were perceived as liking to wear loose-fitting (department) t-shirts or sportswear when they would leave their rooms. Lastly, the respondent students least agreed on statements about Computer use: according to these perceptions, RBM students perhaps were knowledgeable about matters concerning computers/the Internet or other electronic products, or perhaps could impressively assemble computers or solve other peoples' computer-related problems.

The results somewhat echo the findings of past studies that today's college students use the Internet for a variety of purposes: social life (e.g., Matthews & Schrum, 2003), leisure, and adult-type online information (e.g., Bressers & Bergen, 2002; Jones 2009). The most salient perceived characteristics of RBMs concern RBMs' strong preference for sequestering themselves in rooms, playing computer games, conducting Internet-related communication, and forming social spaces on the Internet. In addition, respondents perceived RBMs as engaging in multitasking when it comes to eating and computer activities (see also Lohnes & Kinzer, 2007), wearing comfortable clothes, and adding to their adult collections.

It is worth noting again that this study's respondents tended to assign negative connotations to the term 'room-bound male'. The implication of this finding is that we should use this term carefully. For example, people who use this term to describe themselves or their close friends are probably doing so semi-humorously; however, when used in reference to a person who is not close to the utterer, this term may have the baleful effects of a derogatory stereotype.

**Table 5**  
Means, standard deviations, and MANOVA results for self-evaluated RB or non-RB respondents in the IRBMS ( $n = 494$ ).

	Self-evaluated RB respondents ( $n = 156$ )		Self-evaluated non-RB respondents ( $n = 338$ )		F	Post-hoc test
	Mean	SD	Mean	SD		
Computer hobbies	2.93	0.74	2.99	0.82	0.65	
Social life	2.93	0.74	3.06	0.75	3.37	
Eating habits	2.94	0.83	2.97	0.82	0.20	
Computer use	2.61	0.79	2.57	0.82	0.24	
Adult hobbies	2.57	0.89	2.78	0.89	6.31*	Self-evaluated non-RB > Self-evaluated RB
Clothing styles	2.66	0.86	2.81	0.87	3.03	
The overall IRBMS	2.83	0.57	2.91	0.60	2.11	

\* $p < 0.05$ .



### 5.3. Gender differences among college students in relation to their perceptions of RBMs

Research question 3 asks whether respondents' gender makes any difference in their perceptions of room-bound males. The results of this study show that the female respondents appeared to agree more strongly with the statements covering each IRBMS dimension than did the male respondents (see Table 3). Why is it so? There are at least two possible explanations for this general finding. First, the IRBMS dimensions describe mainly the external behaviors and appearances of room-bound male students, such as these individuals' computer activities, eating habits, and outfits, which are easily observable by other people (e.g., a friend or a date). On the other hand, the IRBMS is less illustrative, if at all, regarding the internal, psychologically diversified states of room-bound males, such as time-management thought processes, enjoyment, sense of achievement, or personal development. Therefore, male respondents' perceptions of room-bound males may contain more of the above-mentioned psychological diversity than female respondents' corresponding perceptions, an important difference that the IRBMS fails to describe. Second, many IRBMS statements refer to content-related types of computer/Internet applications (such as animation, comics, dramas, games). Many male respondents may take these applications for granted. Therefore, male respondents perhaps considered these applications to be typical for *all* male college students, not for only "room-bound males."

### 5.4. Grade-level differences among college students in relation to their perceptions of RBMs

Research question 4 asks whether respondents' grade-level makes any difference in their perceptions of the room-bound male. The results of this study indicate that first- and second-year students (freshmen and sophomores) were more likely than juniors and seniors to agree with the statements covering three IRBMS dimensions—Computer hobbies, Social life, and Eating habits—as well as with the overall IRBMS (see Table 4). Again, a possible reason for this difference in likelihood is that the higher the class-ranking of a student, the more likely the student would be to consider the RBM-like lifestyle "typical." Therefore, upper-class students, whether male or female, would not rate these statements as characteristics attributable uniquely to room-bound males. In other words, RBM-like lifestyle behaviors, such as "usually don't go out on evenings or weekends," "eating instant noodles or micro-waved foods," and "often play online games and watch computer animation" seem to be an acceptable and popular style among, specifically, upper-class college male students. In this perspective, the RBM-like lifestyle might be related to adjustments that college students make to college life; that is, upper-class students typically have already adjusted to college life during their first two years. Another possible reason might be the course structure in Taiwan colleges. The upper-class students often have fewer required courses, more elective courses, or fewer group activities (such as department or class meetings). For these reasons, upper-class students may lead relatively individualistic lives by placing considerable emphasis on such personal projects as preparation for graduate school, preparation for future job opportunities, or pursuit of personal hobbies.

### 5.5. Self-evaluation differences among college students in relation to their perceptions of RBMs

Research question 5 asks whether respondents' self-evaluation makes any difference in their perceptions of the room-bound male. The findings of this study demonstrate that respondents who evaluated themselves as non-RB were more likely than their "RB self-evaluating" peers to agree with the descriptive statements concerning Adult hobbies (such as collections of sexually explicit pictures, adult comics, and pornographic movies on their computers). A possible reason for this difference is that RBM students appear to stay firmly planted in front of their computers most of the time and, for this reason alone, have more opportunities to access a variety of Web content, including adult-type content. It is also possible that respondents who evaluated themselves as non-RB may have assumed that, because RBM students stay in their dorm room most of the time, they might rely on this kind of collection to fulfill—virtually—their physical-psychological needs regarding sexual gratification. In contrast, respondents who evaluated themselves as RB may think that adult-type content are only regular parts of their general collections and entertainment; therefore, they did not show strong agreement on related RBMS statements. Definitely, more research is needed to test our propositions.

## 6. Conclusion, limitations, and recommendations for future research

In sum, this explorative study highlights Taiwanese college students' perception of today's campus-situated "room-bound males" and has empirically validated the IRBMS and its six dimensions via EFA. It is worth noting that we did not intend to make any value judgment concerning either RBMs or RBM lifestyles; rather our intention was to portray RBMs from college students' viewpoint. That is, to identify peer evaluations of RBMs and of RBM lifestyles. The current study reflects our commitment to following the suggestion of [Bennett and his colleagues \(2008\)](#) that researchers propose a more fair-minded approach to and a validated measure of people's perceptions of, in this study, the room-bound male.

Of course the current study here is not without limitations to be addressed. First, the sample for the study was not based on a probability sampling method, thus limiting the generalizability to all Taiwanese college students. Future research may use stratified samples to capture a better representation of college students. Also, because this study is limited to being exploratory research, it lacks a strong theoretical foundation, and therefore, we collected and have discussed only descriptive data. Future research should be more focused on theory-driven constructs and explanations, such as use and gratification theory ([Katz, Haas, & Gurevitch, 1974](#); [Katz et al., 1974](#); [McQuail, 1994](#); see also [Chou & Hsiao, 2000](#)), and personality constructs such as locus of control ([Gerrig & Zimbardo, 2005](#); see also [Matthews & Schrum, 2003](#)). Finally, this study adopted a research approach for investigating only perceptions. No attempt has been made to relate these perceptions to RBMs' actual behaviors. Future research could further investigate the relationship between RBMs' perceptions and behaviors.

Future research could also draw on the IRBMS to probe into emerging campus lifestyles, either extending the focus from male students to female students or focusing exclusively on female students. Another future adaptation of the IRBMS can serve to differentiate RB students from non-RB students on campus. In addition, to advance our understanding of room-bound male college students, future research can delve into related topics, such as room-bound males' involvement in Internet-based sexually explicit material (see also [Lee & Tamborini, 2005](#); [Slade, 2000](#)), sedentary lifestyles ([Lloyd et al., 2007](#)), physical health (see also [Chou, 2001](#); [Clark, Frith, & Demi, 2004](#)), possible Internet addiction (see also [Caplan, 2005](#); [Chou et al., 2005](#)), and overall well-being (e.g., [Caplan, 2003](#); [Cotten, 2008](#)).

From this study, the prevalent perception that RBM students heavily use online communication instead of face-to-face communication suggests the formation of RBM students' own social space in cyberspace. Commenting on this matter, Bargh and McKenna (2004) stated, "Communicating with others over the Internet not only helps to maintain close ties with one's family and friends, but also, if the individual is so inclined, facilitates the formation of close and meaningful new relationships within a relatively safe environment" (p. 582). In this case, future research would do well to explore whether or not RBM students are possibly withdrawn socially, as discussed in some studies on problematic Internet use (e.g., Caplan, 2005; Shapira et al., 2003), and whether or not the stereotypes surrounding otakus, cocoons, and room-bound males are as accurate as many everyday perceptions suggest.

Indeed, the results of the current study support empirically what many college professors and student-affairs administrators have observed anecdotally to be true: some male students spend most of their time in their residence, avoid face-to-face communication, and may have a hard time expressing themselves in a face-to-face environment. Therefore, the results herein have some implications for universities' student-affairs authorities. It is important for universities to ensure that their efforts serving both to increase (or to limit) students' access to information technology and to enhance students' campus life are evidence-based and empirically informed. For instance, the Offices of Student Affairs at some universities in Taiwan have proposed a campus-wide "No Internet Day" to encourage all students, including RBMs, to go outdoors and to enjoy non-digital forms of musical and artistic activities and face-to-face social interactions. Some universities have been shouldering more responsibility for identifying, describing, and preventing the possibility of harmful room-bound situations, especially among freshmen, by having "student mentors"—usually seniors or graduates—live with newer students residing in dormitories.

In conclusion, the present study contributes to our understanding of the Internet's profound impact on college campuses by documenting a self-grounded lifestyle among some college male students in Taiwan, a topic that is lacking treatment in the existing literature. Profiles of room-bound males on college campuses may improve our insights into how these individuals respond to ubiquitous Internet access and resources and, at the same time, how we educators should help our charges live a fruitful campus life in the age of the Internet.

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## Appendix

Means and standard deviations of the statements in each IRBMS dimension ( $n = 533$ ).

Dimension	Item Statement	Mean	SD
Computer activities ( $n = 8$ )	16. When the Internet is not available, they like to play stand-alone computer games.	2.80	0.95
	17. They like to play online games in general.	2.96	0.97
	18. They often play multi-user online games.	3.08	0.99
	19. They often play online role-playing games.	3.08	1.00
	20. They usually play more than two online games at the same time.	2.97	1.01
	21. They often read comics.	2.91	0.96
	22. They often watch computer animation.	3.04	1.01
	25. They can easily talk about the content of more than 10 TV dramas, movies, or comics on the Internet.	2.98	1.04
Social life ( $n = 7$ )	36. They are not good at communicating with others in real life.	2.88	0.92
	37. When chatting with others, they usually talk about their own interests.	2.89	0.88
	38. Their primary social space is the Internet, not physical space.	3.04	0.95
	39. They usually have a hard time expressing themselves in face-to-face environments.	2.98	0.89
	40. They prefer Internet-mediated communication to face-to-face communication.	3.10	0.91
	41. They prefer staying at home or in a room to going out.	3.17	0.94
Eating habits ( $n = 6$ )	42. They usually don't go out on evenings or weekends.	3.06	0.93
	1. They usually eat their meals in front of the computer screen.	3.00	0.93
	2. They like to eat instant noodles in front of the computer screen.	3.03	1.00
	3. They usually eat foods from convenience stores.	3.02	0.98
	4. They usually eat late-night snacks in front of the computer screen.	2.95	0.98
	5. They like to eat prepared foods in front of the computer screen.	2.92	0.97
Computer use ( $n = 4$ )	6. They like to eat microwaved food in front of the computer screen.	2.87	0.99
	32. They are very knowledgeable about computer/Internet use.	2.69	0.95
	33. They can assemble computers.	2.51	0.93
	34. They often help fix other peoples' computer problems.	2.51	0.96
Adult hobbies ( $n = 3$ )	35. They are very familiar with many electronic products/devices other than computers.	2.53	0.90
	47. They collect a lot of pictures of naked women on their computers.	2.69	0.93
	48. They collect a lot of files of adult comics on their computers.	2.74	0.96
Clothing styles ( $n = 3$ )	49. They collect a lot of pornographic movies on their computers.	2.70	0.96
	7. They usually wear their department t-shirt.	2.62	1.05
	8. They usually wear a loose-fitting t-shirt.	2.87	0.99
Total impression	9. When they leave their room, they like to have on sportswear.	2.77	1.04
	56. The term 'room-bound male' has a negative connotation.	2.64	0.89

## Appendix. Supplementary material

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.compedu.2011.07.001.

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