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RELIGIOSITY, ADOLESCENT INTERNET USAGE MOTIVES AND ADDICTION

An exploratory study

Based on secularization theory, this paper analyzes religiosity's relationship with youths' Internet addiction tendencies via possible mediating Internet usage motivations (erotic, social, communication, entertainment and psychological escape). Using self-report questionnaire scales in a study of 1,596 Malaysian adolescent school students, a negative relationship between religiosity and Internet addiction tendency was found to be replicable for females across all four religions studied (Islam, Hinduism, Buddhism and Christianity). However, no such relationship was found for any of the corresponding male groups. This finding is discussed in terms of females being more likely than males to experience the spiritual element of religion and to adhere more to religious norms. The female religiosity – addiction relationship was found to be mediated by psychological escape motives for three of the four religious groups, and erotic motives for two of the groups. The former finding supports a previous claim that escape motives are a prime driver of Internet addictions. It is concluded that, via its prediction of religiosity's negative relationships with Internet usage, secularization theory plays a role in explaining lower likelihood of Internet addiction among more highly religious females, the finding being limited to females because of differing cross-gender socialization pressures.

Keywords Internet addiction; religiosity; motivation; gender

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The concept of Internet addiction is controversial, with disagreements on terminology and definitions continuing (Chou *et al.* 2005; Widyanto & Griffiths 2006; Byun *et al.* 2009). Nevertheless, there is increasing acceptance of the idea that people can become addicted to Internet-related activities. Various studies have identified this as an international phenomenon with overall prevalence estimated

in the ranges of 4.6–4.7 percent for adolescents, 6–15 percent for general populations and 13–18.4 percent for college students (Young *et al.* 2011). In one prominent diagnostic instrument (the Internet Addiction Diagnostic Questionnaire – Young 1998a), criteria for Internet addiction are mental preoccupation, needing to use it for ‘increasing amounts of time’ to achieve previous levels of satisfaction, experiencing dysphoric moods when curtailing its use, ‘staying on-line longer than originally intended’, jeopardizing significant relationships or educational/vocational chances because of activities, lying to significant others ‘to conceal extent of involvement’ and using it as a means of ‘escaping from problems or relieving a dysphoric mood’ (quotations from Young 2011, pp. 20–21).

Studies of religiosity’s influence on general Internet usage (rather than how religious groups use it for religious purposes) are few (Campbell 2006). However, with rising concerns about Internet addiction, investigation of the role that religiosity might have in reducing susceptibility to addiction is useful in furthering debates into its causes and in helping to design and target intervention strategies.

It is important to note the distinction between religion (a person’s religious denomination) and religiosity (the strength of a person’s religious observance, as indicated by their adherence to their religion’s rituals, and the extent to which their daily existence is guided by the principles espoused by their religion). Religion can be a highly potent force guiding moral behavior and deterring religiously inclined people from involvement in many socially problematic activities (Durkheim 1912/1995). Research consistently reports religiosity as playing a key role in deterring smoking, use of drugs and other addictive substances, and promiscuous sexual behavior (Koenig *et al.* 2001; Wallace *et al.* 2003; Dunn 2005; Weaver *et al.* 2005). This might be because religion has both a normative function, the above types of behaviors being against the norms of religious groups of which a person is a member, and an integrative function, social support often being a concomitant of religious group membership with a resultant lesser need to resort to the aforementioned behaviors as anxiety-reducing mechanisms (Hood *et al.* 2009). Thus, the more highly engaged people are with the values of their religion and the more integrated they are in to their religious community (i.e. the greater their religiosity is), the less susceptible they are likely to be to various chemical and behavioral addictions.

While Singaporean religious leaders (including those from the religions presently studied) have been reported to view the Internet as a tool that is not intrinsically harmful (Kluver & Cheong 2007), secularization theory predicts that religiosity should restrain the general extent of peoples’ Internet use, thus reducing their likelihood of succumbing to Internet addictions. Secularization theory can be traced back to Weber (1958) who noted that an increasing Western emphasis upon rational thought, scientific empiricism and technological advancement since the sixteenth century has led to the gradual devaluation of mysticism and

religion as explanations of the natural order of things (Swatos & Christiano 1999). Using secularization theory as a basis, Armfield and Holbert (2003) reasoned that strength of religiosity should be negatively related to Internet use because the content to be found on the web is generally secular in nature and non-reflective of religious values. Their analysis of US survey data supported this, although, while significant, the effect size was small (Pearson's $r = -0.089$). The present paper sought to extend Armfield and Holbert's (2003) work by considering whether greater adolescent religiosity is related to a lesser propensity to be motivated to use the Internet for various purposes (eroticism, psychological escape, social interaction and entertainment) and whether, in turn, this is related to a lesser likelihood of Internet-related addictions. The extent to which any effects of religiosity differ across religion and gender was also considered.

Consistent with secularization theory, in Western societies, conservative religious beliefs are negatively related to the viewing of sexual and violent television programs (Atkin 1985; Hamilton & Rubin 1992) and cyberpornography (Stack *et al.* 2004; Smith & Denton 2005). Also, there is evidence that religiosity reduces time spent upon entertainment. For example, religious American youths watch less television and play fewer video games (Thomsen & Rekve 2003; Smith & Denton 2005). Likewise, religiosity is likely to be negatively related to Internet addiction for a number of reasons. For example, use for erotic stimulation is often a factor in Internet addictions (Meerkerk *et al.* 2006) and, because emphasis upon sexual restraint is the norm for many religions (a fact reflected in Kluver and Cheong's (2007) study of Singaporean religious leaders' views of the Internet), Internet use for sexual purposes is likely to be less prevalent among highly religious people than it is in the larger societies of which they are part; a case of religion's normative function coming into play. As implied in Young's (1998a) Internet addiction criteria, many Internet activities (e.g. online chat and online game playing) are also potentially addictive because they allow psychological escape from everyday problems. Indeed, Young's (1998b) clinical experience led her to conclude that a desire for escape is usually the primary driver of Internet addictions. The need for escape might be less among highly religious people for at least three reasons. First, their lifestyles might lead to lower exposure to stressors. For example, religiosity is negatively related to (presumably stress-inducing) delinquent and risky behavior among US adolescents (Smith & Faris 2002). Also, a more religious existence is likely to result in a more fulfilled and contented life (Pollner 1989). Second, where stressors are encountered, perceptions of supernatural support can have a buffering effect (Maton 1989). Third, as the integrative function of religion (Hood *et al.* 2009) suggests, religious people might benefit from greater social support from other members of their religious communities, these communities providing particularly strong support (Argyle 1996). Unsurprisingly then, religiosity is favorably associated with a number of indices of mental health, including lower anxiety and depression, and greater self-esteem and self-control (Blaine *et al.* 1998).

Thus, religiosity may protect against Internet-related addictions, with high neuroticism/trait anxiety and low self-esteem being highly implicated in the etiology of such addictions (Charlton & Danforth 2010).

In a sister paper using part of the present data set, path modeling of relationships between parental and peer attachment, the present motivational variables and Internet addiction scores confirmed that as escape, erotic and social interaction motives increased, Internet addiction scores increased, the effects of the first two motives being greater than that of the last (Soh *et al.* 2012), there was also a significant positive bivariate correlation between entertainment motives and addiction. These findings support the ideas that psychological escape plays a pivotal role in some online addictions (Young 1998a, 1998b), that use of the Internet for erotic purposes can also be addictive because (highly stimulating) material is encountered anonymously and privately according to a variable-ratio reinforcement schedule (Joinson 2003), and that social media use can be addictive both because responses to messages are often received on a variable-ratio reinforcement schedule and because it can provide social reinforcement (particularly for people with low self-esteem or who are socially isolated (Wallace 1999; Morahan-Martin & Schumacher 2000)).

Given the above, and the possibility that greater religiosity is a concomitant of lesser Internet addiction tendencies because of the factors discussed earlier, the present paper tested the proposition that any negative relationships between religiosity and addiction would be attributable to more religious people being less highly motivated to use the Internet for escape, erotic, social communication and entertainment purposes. The following general hypotheses were, therefore, tested (since our other paper using the present data set tested hypotheses involving relationships between Internet usage motivations and Internet addiction, a general hypothesis to this effect is not included here):

H1: Greater religiosity is associated with lower likelihood of Internet addiction.

H2: Greater religiosity is associated with lesser Internet usage motivations (for all types of usage).

H3: Internet usage motivations mediate the relationship between religiosity and Internet addiction.

Since studies have been mainly conducted in Western countries, the previously mentioned religiosity-focused literature was based largely on Christian samples. The collection of data in Malaysia afforded the present study the opportunity to test for nuances in relationships across adherents of four major world religions, each of which have a sizable following within the country; Islam, Hinduism, Buddhism and Christianity. There are some slight differences in emphasis in the

moral and ethical stances of these religions. For example, Southeast Asian Buddhism emphasizes the avoidance of self-harm or harm to others (Cousins 1997), all variants of Hinduism emphasize giving and compassion (Markham 1996), Islam puts emphasis on the word of God as set down in the Qur'an and has specific prohibitions against gambling and non-marital sex (El-Droubie 1991), and Christians are encouraged to live according to the teachings of Jesus, which emphasize love for one's fellow humans, although differing interpretations of this can lead to radically different moral standpoints (Cole 1991). However, people characterized by high religiosity tend to have conservative attitudes irrespective of the religion concerned (Hood *et al.* 2009), and all religions seek to teach their adherents a moral way of living, with remarkably few major differences in ethical approach appearing to exist between the four religions presently studied. For example, while seeing leisure activities in a positive light, all of the religions encourage their adherents to maintain self-control and lead well-balanced lives, without engaging in any particular activity to excess and acting with sexual restraint (Morgan & Lawton 1996). Not surprisingly then, a search of the literature revealed little to support the hypothesizing of cross-religion differences in sizes of relationships between the variables presently examined. It was therefore concluded that the three general hypotheses under test should apply equally well to each of the religions studied. Nevertheless, heeding Argyle and Beit-Hallahmi's (1975) call for the testing of 'general theories of religious behaviour . . . in a variety of . . . contexts' (p. 6), analyses were conducted separately for the four different religions, it being recognized that the discovery of any cross-religion differences might provide impetus for future research. Also, within each religion, male and female data were analyzed separately because Western studies show gender differences in the uptake of specific Internet activities, with males using the Internet more than females for accessing pornography, information, entertainment and commerce, but females using it more for communication (Jackson *et al.* 2001; Træen *et al.* 2004; Wasserman & Richmond-Abbott 2005; Hald 2006).

Method

Design and participants

A cross-sectional correlational design was used, participants being 1,596 school students from 16 randomly selected schools in four states of Peninsular Malaysia (Penang, Kuala Lumpur, Melaka and Kelantan). There were 852 females and 744 males with ages 15–17 (mean age = 16.07 years, SD = 0.83 years). There were 998 Muslims (62.5 percent of the sample; 98 percent of the Muslims being ethnic Malay), 397 Buddhists (24.9 percent of the sample; 98 percent of the Buddhists being ethnic Chinese), 99 Hindus (6.2 percent of the sample;

98 percent of the Hindus being ethnic Indians) and 102 Christians (6.4 percent of the sample; with 66 percent of the Christians being ethnic Chinese, 25 percent being ethnic Indian, 1 percent being ethnic Malay and the remaining 8 percent being of other non-specified ethnic groups). The percentages of each religion in the sample were roughly representative of the proportion of each religion's adherents in Malaysia, percentage statistics at the turn of the millennium being as follows: Muslims, 60.8; Buddhists, 18.9; Hindus, 6.2; and Christians, 9.1 (Swee-Hock 2007). Analysis of differences (independent samples *t*-tests) between Christian Chinese and Christian Indians revealed no significant differences with respect to religiosity, any of the four motives studied or Internet addiction scores. Therefore, Christians were analyzed as a single group.

Materials and procedure

Materials consisted of a single paper booklet asking for demographic details (including age, gender, religion, race, number of years of Internet experience and current amount of Internet usage), and three instruments: measuring religiosity, Internet usage and addiction tendency. All three of these instruments involved five-point Likert scale responses (*strongly disagree* to *strongly agree*), responses being numerically recoded (1–5) to produce high scores indicating more of the construct expressed by scale labels.

The religiosity measure was adapted from the short-form of the Santa Clara Strength of Religious Faith Questionnaire (Storch *et al.* 2004). The scale consists of five items, and was adapted by replacing the word 'faith' with 'religion' because while the former is meaningful to Muslims and Christians, it may not make sense to Buddhists and Hindus. The original four-point Likert scale was replaced with a five-point scale to make it uniform with the other scales to avoid participant confusion. Items focused upon issues such as the extent to which participants perceived that religion provided meaning and purpose in their lives, whether their religion affected many of their decisions and whether they prayed every day. Minimum and maximum possible scores were 5 and 25, respectively. For the present data, Cronbach's alpha was 0.84 for the religiosity measure.

Using data both from pilot studies and from the present project, the Internet usage motives questionnaire and the Internet addiction scale described below were subjected to confirmatory factor analyses to refine them and verify their suitability for the present project. In what follows, the content of the instruments is that remaining subsequent to these analyses.

The motives questionnaire was adapted from Huang (2004), who measured five motives: entertainment, escape/pastime, social interaction, surveillance/information and monetary. Only data for the first three motives were included here as Internet addiction is likely to be particularly associated with these less utilitarian forms of Internet usage. Subscale details were as follows:

entertainment, four items (minimum and maximum possible scores = 4 and 20, respectively, Cronbach's $\alpha = 0.72$); social interaction, five items (possible minimum and maximum = 5 and 25, $\alpha = 0.85$); escape/pastime, five items (this subscale is subsequently referred to as 'escape' for brevity; possible minimum and maximum = 5 and 25, $\alpha = 0.69$). Also included was a new erotic motivation dimension consisting of five items (possible minimum and maximum = 5 and 25, $\alpha = 0.88$).

The Internet addiction scale was adapted from an instrument validated by Charlton and Danforth (2010), and derived from factor analytic studies distinguishing computing and Internet gaming addictions from (non-pathological) high engagement (Charlton 2002; Charlton & Danforth 2007). Items were adapted by replacing the name of the computer game in Charlton and Danforth's (2007) study with reference to the Internet. For example, 'Arguments have sometimes arisen at home because of the time I spend playing Asheron's Call' became 'Arguments have sometimes arisen at home because of the time I spend on the Internet'. Cronbach's alpha was 0.87 for the 10-item measure used. Minimum and maximum possible scores were 10 and 50, respectively.

Participation was voluntary, with classes completing the questionnaire booklet in a single formal teaching session during school hours.

Results

For each religion and gender combination separately, analyses tested relationships between participants' religiosity and Internet addiction scores and these variables' relationships with motives, and mediating effects of motives on religiosity – addiction relationships. Table 1 shows descriptive statistics for each combination.¹

The correlation coefficients in Tables 2–5 show that the hypothesis that addiction scores would decrease significantly with increasing religiosity (*H1*) was supported for females of all four religions, but that there were no similarly significant relationships for males. With respect to the hypothesis that greater religiosity would be associated with lesser Internet usage motivations (*H2*), the pattern was also similar with respect to relationships between religiosity and escape motives, greater female religiosity being related to lesser motivation to use the Internet for escape across all religions, but no such hypothesized relationships existing for males. However, there was less of a gender difference in patterns of correlations between religiosity and relationships for the other three motives; for both sexes, the hypothesis that erotic motives would decrease with increasing religiosity was supported for Muslims and Hindus (and also for male Buddhists), but not for Christians of either gender. For Hindus, apart from a negative religiosity – entertainment relationship for females, contrary to

TABLE 1 Descriptive statistics for all variables by religion and gender.

	<i>Gender</i>					
	<i>Female</i>			<i>Male</i>		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Muslim						
Religiosity	544	21.13	2.71	454	21.19	2.96
Internet addiction	544	22.31	7.63	454	25.43	7.84
Entertainment	544	15.91	2.63	454	16.08	2.24
Social interaction	544	18.53	3.98	454	18.49	3.60
Eroticism	544	9.20	4.07	454	13.50	4.95
Escape	544	16.92	3.72	454	17.43	3.29
Buddhist						
Religiosity	215	15.31	3.71	182	14.59	4.67
Internet addiction	215	26.33	7.46	182	29.13	8.47
Entertainment	215	15.85	2.57	182	16.23	2.64
Social interaction	215	19.13	3.54	182	19.33	3.72
Eroticism	215	11.16	4.34	182	15.18	4.80
Escape	215	17.56	3.33	182	17.87	3.44
Hindu						
Religiosity	41	19.56	4.06	58	19.57	3.31
Internet addiction	41	21.58	8.72	58	23.81	8.40
Entertainment	41	15.93	3.06	58	15.89	3.19
Social interaction	41	17.78	5.19	58	18.73	4.12
Eroticism	41	8.90	4.31	58	14.99	6.20
Escape	41	15.88	4.69	58	16.94	4.22
Christian						
Religiosity	52	20.04	4.10	50	18.64	3.54
Internet addiction	52	24.81	8.48	50	29.10	7.54
Entertainment	52	16.69	2.50	50	16.36	2.48
Social interaction	52	18.92	4.51	50	20.18	3.13
Eroticism	52	11.15	5.49	50	13.98	4.79
Escape	52	17.37	4.19	50	18.25	3.63

hypothesis, there were no religiosity – motive relationships for either gender as far as the entertainment and social interaction motives were concerned.

It is useful to note that, without exception, for all religion – gender combinations, motivational variables were significantly positively correlated. Thus, people who are highly motivated to use the Internet for one purpose tend to be highly motivated to use it for other purposes. As might be expected,

TABLE 2 Correlations (Pearson's r) between all variables for Muslim males (above diagonal)^a and Muslim females (below diagonal)^b.

	<i>Religiosity</i>	<i>Internet addiction</i>	<i>Entertainment</i>	<i>Social interaction</i>	<i>Eroticism</i>	<i>Escape</i>
Religiosity	–	–0.05	–0.01	0.07	–0.09*	–0.05
Internet addiction	–0.11**	–	0.32***	0.29***	0.35***	0.45***
Entertainment	–0.03	0.35***	–	0.37***	0.33***	0.66***
Social interaction	0.02	0.38***	0.48***	–	0.16***	0.31***
Eroticism	–0.15***	0.39***	0.31***	0.28***	–	0.45***
Escape	–0.07	0.46***	0.76***	0.43***	0.38***	–

^a $n = 454$.^b $n = 544$.* $p < 0.05$ (one-tailed).** $p < 0.01$ (one-tailed).*** $p \leq 0.001$ (one-tailed).**TABLE 3** Correlations (Pearson's r) between all variables for Buddhist males (above diagonal)^a and Buddhist females (below diagonal)^b.

	<i>Religiosity</i>	<i>Internet addiction</i>	<i>Entertainment</i>	<i>Social interaction</i>	<i>Eroticism</i>	<i>Escape</i>
Religiosity	–	–0.07	0.04	–0.10	–0.13*	–0.05
Internet addiction	–0.21***	–	0.26***	0.38***	0.38***	0.45***
Entertainment	0.08	0.44***	–	0.46***	0.23***	0.60***
Social interaction	–0.09	0.38***	0.46***	–	0.31***	0.48***
Eroticism	–0.09	0.39***	0.30***	0.40***	–	0.37***
Escape	–0.19	0.55***	0.68***	0.53***	0.44***	–

^a $n = 182$.^b $n = 215$.* $p < 0.05$ (one-tailed).** $p < 0.01$ (one-tailed).*** $p \leq 0.001$ (one-tailed).

TABLE 4 Correlations (Pearson's r) between all variables for Hindu males (above diagonal)^a and Hindu females (below diagonal)^b.

	<i>Religiosity</i>	<i>Internet addiction</i>	<i>Entertainment</i>	<i>Social interaction</i>	<i>Eroticism</i>	<i>Escape</i>
Religiosity	–	0.05	–0.08	–0.05	–0.23*	–0.09
Internet addiction	–0.39***	–	0.30**	0.29*	0.28*	0.39***
Entertainment	–0.26*	0.44**	–	0.55***	0.53***	0.83***
Social interaction	–0.19	0.45***	0.68***	–	0.45***	0.54***
Eroticism	–0.52***	0.66***	0.44**	0.47***	–	0.42***
Escape	–0.41**	0.66***	0.77***	0.61***	0.66***	–

^a $n = 58$.^b $n = 41$.* $p < 0.05$ (one-tailed).** $p \leq 0.01$ (one-tailed).*** $p \leq 0.001$ (one-tailed).

correlations between the escape and entertainment motives were the greatest in all instances. While the aforementioned correlation attained a value as high as 0.83 (for Hindu males), these correlations were not high enough to pose statistical problems involving multicollinearity ($r = 0.90$ – Tabachnick & Fidell 2001). Although it can be useful to remove one member of a pair of variables on logical grounds where correlations exceed 0.70 (Tabachnick & Fidell 2001), it was

TABLE 5 Correlations (Pearson's r) between all variables for Christian males (above diagonal)^a and Christian females (below diagonal)^b.

	<i>Religiosity</i>	<i>Internet addiction</i>	<i>Entertainment</i>	<i>Social interaction</i>	<i>Eroticism</i>	<i>Escape</i>
Religiosity	–	–0.05	–0.01	–0.16	–0.21	–0.01
Internet addiction	–0.28*	–	0.41**	0.39**	0.31*	0.61***
Entertainment	–0.17	0.24*	–	0.53***	0.27*	0.78***
Social interaction	–0.07	0.41***	0.41***	–	0.26*	0.52***
Eroticism	–0.08	0.27*	0.24*	0.32**	–	0.47***
Escape	–0.33**	0.46***	0.68***	0.47***	0.39**	–

^a $n = 50$.^b $n = 52$.* $p < 0.05$ (one-tailed).** $p \leq 0.01$ (one-tailed).*** $p \leq 0.001$ (one-tailed).

considered important to retain both the escape and entertainment variables in the analyses presented below to test for differences in the mediational properties of the two motives. Greater motivations to use the Internet were related to greater Internet addiction scores (a fact reported in the sister paper), this being true for all of the motivational variables across all religious groups irrespective of gender. Given these observations, to test whether the higher religiosity – lower addiction relationships found for females were mediated by lower motivations to use the Internet (*H3*), mediation analyses were performed using simultaneous assessment of multiple mediators (Preacher & Hayes 2008). Following Baron and Kenny (1986), for each religion – gender combination, only motives that displayed

TABLE 6 Bootstrap statistics (based upon 5,000 samples) for the analyses of indirect (mediating) effects of motives upon the religiosity–addiction relationship for females.

	<i>Effect</i>	<i>SE</i>	<i>Bias corrected 95 percent CI</i>	
			<i>Lower</i>	<i>Upper</i>
Muslim (<i>N</i> = 544)				
<i>Mediator</i>				
Eroticism	−0.054	0.019	−0.096	−0.022
Escape	−0.039	0.022	−0.087	0.001
<i>Contrasts</i>				
Eroticism versus escape	−0.014	0.024	−0.058	0.036
Buddhist (<i>N</i> = 215)				
<i>Mediator</i>				
Escape	−0.103	0.040	−0.189	−0.030
Hindu (<i>N</i> = 41)				
<i>Mediator</i>				
Entertainment	−0.031	0.047	−0.026	0.174
Eroticism	−0.224	0.158	−0.666	−0.014
Escape	−0.213	0.111	−0.529	−0.058
<i>Contrasts</i>				
Entertainment versus Eroticism	0.255	0.156	0.033	0.668
Entertainment versus escape	0.244	0.147	0.043	0.671
Eroticism versus escape	−0.011	0.215	−0.510	0.368
Christian (<i>N</i> = 52)				
<i>Mediator</i>				
Escape	−0.144	0.079	−0.346	−0.028

Note: CI, confidence interval.

significant correlations with both religiosity and addiction were included in analyses. Table 6 provides point estimates and confidence intervals derived from (bias corrected) bootstrapping. In these analyses, data were standardized to facilitate comparison of (ordinary least squares) effect coefficients across variables.

In that they did not contain zero, the bootstrap confidence intervals on the right-hand side of Table 6 show that erotic motivations mediated the negative religiosity – addiction relationship for Muslim and Hindu females. Similarly, the confidence intervals show that escape motives also mediated this relationship for Buddhist, Hindu and Christian females. However, entertainment motives did not mediate the relationship for Hindu females (the only group where there was a significant bivariate correlation between religiosity and entertainment motives). Consistent with the correlations in Tables 2–5, Table 7 shows that regression coefficients for the relationships between religiosity and the erotic and escape motives were negative and that relationships between these two motives and addiction were positive. Therefore, the negative signs in the effect column of Table 6 can be interpreted as indicating that more religious females of the above-mentioned denominations were less likely to be motivated to use the Internet for erotic and escape purposes, and that, in turn, these lower motivations scores were related to lower Internet addiction scores. The results of the contrasts in Table 6 show that the mediating effects of eroticism and escape were not significantly different for either Muslim or Hindu females, but that the effects of these two motives were both significantly greater than that of entertainment for Hindu females. Note that non-significant direct effects of religiosity

TABLE 7 Statistics for components of paths in the analyses of indirect (mediating) effects of motives upon the religiosity – addiction relationship for females.

	<i>Religiosity to motive</i>				<i>Motive to addiction</i>			
	<i>Coefficient</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>Coefficient</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Muslim (<i>N</i> = 544)								
Eroticism	-0.190	0.052	-3.62	< 0.001	0.282	0.048	5.94	< 0.001
Escape	-0.120	0.069	-1.73	0.083	0.329	0.036	9.11	< 0.001
Buddhist (<i>N</i> = 215)								
Escape	-0.198	0.071	-2.79	0.006	0.523	0.057	9.17	< 0.001
Hindu (<i>N</i> = 41)								
Entertainment	-0.331	0.194	-1.71	0.096	-0.101	0.162	-0.63	0.533
Eroticism	-0.451	0.120	-3.77	0.001	0.482	0.208	2.32	0.026
Escape	-0.553	0.199	-2.78	0.008	0.398	0.178	2.24	0.031
Christian (<i>N</i> = 52)								
Escape	-0.393	0.161	-2.45	0.018	0.369	0.118	3.13	0.003

upon addiction showed that the relevant motives fully mediated the religiosity – addiction relationship for all groups of females; Muslims, coefficient = -0.069 , $SE = 0.054$, $t = -1.27$, $p = 0.204$; Buddhists, coefficient = -0.119 , $SE = 0.060$, $t = -1.98$, $p = 0.050$; Hindus, coefficient = -0.028 , $SE = 0.150$, $t = -0.19$, $p = 0.853$; Christians, coefficient = -0.150 , $SE = 0.142$, $t = -1.06$, $p = 0.294$.

Discussion

The present paper investigates relationships between religiosity and adolescents' Internet usage motives and addiction. Perhaps the single most interesting observation was that greater religiosity was associated with lower addiction scores (*H1*) across all four religions for females but not for males. The cross-religion robustness of the gender specificity of this finding suggests that gender-related phenomena are more at play than religion-specific factors here. One possibility is that girls take their religion more seriously than boys. Support for this comes from psychological literature showing that US females have a closer relationship with God than males and experience the spiritual element of religion more intensely than males (Feltey & Poloma 1991). Feltey and Poloma also argue that females are likely to adhere more strongly to religious norms, citing the suggestion of Argyle and Beit-Hallahmi (1975) that the sexes are subjected to differing socialization pressures which often results in greater female conformity, and also citing feminist literature (e.g. Christ & Plaskow 1979) arguing that traditional religions constitute a means of perpetuating male dominance of females (see also Stopler 2008). Assuming that the aforementioned Western observations are generalizable to Southeast Asian countries such as Malaysia, all of the above observations might make females of any degree of religiosity more likely to conform to what they believe their religion demands of them than males of an equivalent degree of religiosity.

The presence and absence of relationships between religiosity and Internet usage motivations (*H2*) varied across different religions and genders. Greater religiosity was related to lesser motivation to use the Internet for escape purposes for females, but not males, of all religions. As discussed above, the possibility that girls take their religion more seriously than males might explain the gender-specific nature of this finding. Future research might consider the extent to which this is because (a) a more serene way of living among more highly religious females leads to lower exposure to life-stressors (Smith & Faris 2002), (b) the perception of a supportive God (or succor derived from other spiritual factors) acts as a buffer where stress is encountered (Maton 1989), and/or (c) problems are ameliorated by the provision of greater social support than would otherwise be received by virtue of highly religious females being highly integrated into a religious community (Argyle 1996).

For both sexes, erotic motives decreased with increasing religiosity for Muslims and Hindus (and also for male Buddhists), but not for Christians of either gender (note though, that the effect size of the religiosity – eroticism relationship for Christian males was greater than that for Muslim and Buddhist males, sample size issues being important here). Thus, it appears that Western findings that more conservative religious beliefs are associated with lesser viewing of cyberpornography (Stack *et al.* 2004; Smith & Denton 2005) apply to some extent to Malaysian adolescents.

In general (apart from a negative relationship between religiosity and entertainment motives for female Hindus), irrespective of gender there were no relationships between religiosity and the entertainment and social interaction motives. Thus, with respect to Malaysian adolescents at least, secularization theory's prediction of a negative religiosity – Internet usage relationship on the grounds of web content being generally secular and non-reflective of religious values can be said to be dependent upon the type of Internet activity involved and both a person's gender and religion.

Given the above observations, support for the general hypothesis that Internet usage motivations would mediate any relationships between religiosity and Internet addiction (*H3*) was again variable. Mediation analyses showed that the more religious Buddhist, Hindu and Christian females' lower escape motivations fed through to lower Internet addiction scores, and that the more religious Hindu and Muslim females' lower erotic motivations also fed through to lower Internet addiction scores. However, entertainment and social interaction motives did not mediate the negative religiosity – addiction relationship. These results suggest that more religious females are less prone to being addicted to Internet-related activities because of a lesser need to use the Internet as a means of psychological escape from the pressures and anxieties of their everyday lives. This lends weight to Young's (1998b) claims concerning the primacy of escape motives as a driver of Internet addictions. Again, further research into the ways in which religiosity may reduce Internet addiction risk by helping people deal with stress might shed light upon the specific mechanisms underlying the present findings.

One surprising finding was that eroticism mediated the religiosity – addiction relationship for any female religious group, and that where such mediating effects occurred (for Muslim and Hindu females) they were as great as for the effects for escape. This is surprising because erotic Internet usage is usually considered to be more of a male phenomenon (Træen *et al.* 2004; Hald 2006). However, the present data set shows that, even in adolescent female samples, increasing motivations to use the Internet for erotic purposes are predictive of an increasing tendency toward Internet addiction. Female religiosity, however, can reduce erotic motivations, increasing religiosity in females being likely to lead to greater conformity with the religious norm to downplay sexual issues, this ameliorating risk of addiction.

Conclusions

From the present study, it can be concluded that, in Malaysia at least, more religious females (but not males) are less likely to become addicted to Internet-related activities, and that escape and erotic motives often, but not always, mediate this relationship. It seems, then, that, similar to the role that it plays in deterring other potentially harmful behaviors, religiosity might have benefits in reducing adolescents' susceptibility to Internet-related addictions, but that this might only apply to females. In terms of theory, this finding extends those of Armfield and Holbert (2003) who verified secularization theory's prediction of a negative relationship between religiosity and Internet use; the present results imply that secularization theory plays a role in explaining lower likelihood of Internet addiction, at least as far as females are concerned, religiosity being negatively related to certain Internet usage motivations and such motivations being positively related Internet addiction scores, with, in some instances the mediating effects of usage motivations on the religiosity–addiction relationship being significant.

The findings suggest that it might be possible to reduce the frequency of Internet-related addictions by considering the mechanisms by which increased female religiosity is related to lower addiction tendency, and developing interventions which can be implemented within a more secular context. In particular, the present results suggest that lesser need for psychological escape because of lower exposure to stress, more effective buffering of stress or provision of greater social support might be important.

The above said, the present study has limitations. First, the relatively small number of Christians ($n = 102$) and Hindus ($n = 99$) surveyed might have contributed to anomalies in findings for these groups, such as erotic motives not being significantly negatively related to religiosity in male Christians despite the effect size (r) being larger than that for male Buddhists and Muslims. Future studies obtaining larger sample sizes for these religions would be useful. Second, the study used a self-report methodology. Although the telling of untruths is anathema to many religions, participants may well have experienced internal conflict between responding honestly and responding according to the perceived norms of their religion. Most obviously, many participants may have struggled to report their Internet usage for erotic purposes objectively. This may have had a particular bearing upon the finding that erotic motivations mediated the religiosity–addiction relationship for some groups of females, given that it was argued earlier that greater conformity to religious norms may have been one reason for the highly robust gender difference in the presence and absence of a negative religiosity–addiction relationship for females and males, respectively. Ideally, future studies might attempt to use less direct, more implicit, methods to verify the present findings. Assuming verification,

other work might also consider reasons for the presently identified differing patterns of relationships between religiosity and Internet usage motives and addiction, taking into account the specific teachings and beliefs of each of the religions considered, although such studies would have to take into account the fact that there are many different variants of each religion. Also, race and religion were confounded to a great extent in the present study, and therefore the idea that cultural factors connected with race, rather than religious factors, are at least partially responsible for the present differential patterning of results across religions cannot be ruled out; future studies should consider this possibility too.

Note

- 1 Although the present focus is not on religious and gender differences for each of the variables studied, note that a MANOVA, follow-up ANOVAs and *post hoc* (Games Howell) analyses with the motives as dependent variables showed that Buddhists had greater social interaction, escape and erotic motives than Muslims, and that males had greater erotic motives than females. Also, ANOVAs and *post hoc* analyses with religiosity and Internet addiction as dependent variables showed greater religiosity in Muslims than in the other religions, lesser religiosity in Buddhists than in the other religions, and greater religiosity for females than for males. These analyses also showed that Buddhists and Christians obtained significantly greater addiction scores than both Muslims and Hindus, and greater Internet addiction scores for males compared to females.

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