Media use and dream associations between Canadians of differing cultural backgrounds

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Summary. Canadian students of varying cultural backgrounds took an online survey for course credit examining their dream experiences (Dream Intensity Scale, DIS; Yu, 2010) and history of media use, i.e., social media and video game play. Regression analyses onto the data found that the role of sex and culture, relative to history of media use, was strongest with total DIS scores as well as dream recall and nightmare information, which is often reported in the literature. Media use was also a component of these two dimensions but its role in predicting self-reported dream experiences was stronger for the other types of DIS information. In general the findings with media use seem to fall around age the subject began using social media or gaming as well as their use of MySpace, one of the first social media sites and thus presumably longest used. These findings support Lambrecht, Schredl, Henley-Einion, and Blagrove (2013) in terms of the continuity hypothesis of dreaming and high frequency of an activity resulting in more dream incorporation.

Keywords: video game play, bizarreness; lucid dreaming

1. Introduction

The current study is an exploratory investigation of the mediating affects that culture may have on the relationship between dreaming and media use, specifically video game play and social media. Video game play and social media warrant investigation because of their increasing popularity. With the increased spread and advancement of technology both social media and video games are more accessible and mobile. Among 18 to 29 year olds 87% use Facebook with increasing usage of secondary social media such as Instagram increasing (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). As for video game play the Entertainment Software Ratings Board reported in 2014 that 51% of Americans play video games with 32% of those being between 18 and 35 years of age (ESRB, 2014). This increased accessibility, in turn, have led the elderly, stay at home moms, and women in general to use more social media and video games. Another contributing factor to this increased use among certain demographics are the development or popularization of causal games. Causal games are easier to play, less intense, have less of a learning curve and do not require a game console or additional equipment other than a computer. As the popularity of video game and social media increases so too does the negative stigmatization about video games, social media and their users. By increasing our knowledge about how video games and social media actually effects people we can decrease the stigmatization and better understand the various effects.

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Culture is a particular factor of interest that was highlighted in 2013 when the American Psychiatric Association released the newest version of their Diagnostic and Statistical Manual with mention of "Video Gaming Disorder" (American Psychiatric Association, 2013). The association's inclusion of Video Gaming Disorder is based in part upon the increased growth of gaming in China and the research that is mentioned and needed to establish the criteria for video game addiction. This echoes a trend towards the development of criteria based on a behavioural model of addiction (Seok & DaCosta, 2012) in contrast to earlier research, which measured video game addiction based on psychological criteria (Fisher, 1994; Griffiths, 1998). There is inconclusiveness as to what defines video gaming disorder, however, and what reliable and valid scales and assessments we can use. Consequently, in this study we will consider the role of culture in our investigation of the positive and negative effects that gaming and other heavy media use, such as social media, has on users via their dreams. Culture is explored as a function of different ethnic backgrounds and self-construal among Canadian students.

Within this study, dreams are treated as a vehicle that reflects waking experiences. In current dream research an early theory of dream content was suggested by Hall and Nordby's Continuity Hypothesis (1972), which suggests that dreams are reflective of our waking life. This has become a dominant theoretical perspective (Schredl, 2003) in the dream research literature. In a similar vein is research conducted by Ortiz de Gortari, Aronsson, and Griffiths (2011) on the "game-transfer" phenomenon in both waking and dreaming. Game transfer refers to learned responses acquired in video game play that shift to other realms of reality, such as waking and dreaming.

A prime example of the Game Transfer phenomenon is the nightmare protection effect (Gackenbach, Ellerman, & Hall, 2011). In their 2011 study, Gackenbach et al. found that males who played action video games had learned responses that transferred into their dreams and protected them in part from threats. This protection effect, however,

was not seen in females in a later study (Gackenbach, Darlington, Ferguson, & Boyes, 2013) largely due to the genre of video games played by females. Female gamers tend to play more casual games, such as solitaire and Farmville. In this genre women are not acquiring the same learned responses that men are in action games such as Call of Duty, Halo, etc. This past research demonstrated the benefits of video game play in dreaming but what about social media use? Do social media users experience a transfer phenomenon like video gamers? Cirucci (2013) hypothesized that video game players would display similarities to social media users. Gackenbach and Boyes (2014) found, when examining both types of media use (video game play, VGP, and social media use, SMU), that high VGP/high SMU group had the thinnest psychological boundaries and thus were perhaps most susceptible to media effects. At the same time this group of high end media users showed the least negative self-concepts in their recent dream content.

The effects of media use are captured most truthfully in dream studies. They have a particular advantage because dream reports can eliminate the Halo Effect seen in self-report data, when people see themselves in an unduly positive light (Aaronson, Timothy, Akert, & Fehr 2010). Asking about dreams, however, can be accomplished in several ways including recalling a recent dream and responses to some sort of dream experience assessment. Recent dream recall may not reflect what is seen as typical dream themes as demonstrated by Mathes and colleagues in a recent study (Mathes, Schredl, & Goritz, 2014). Typical dream themes are seen more in a collection of dreams from an individual than a recent dream, which may more closely reflect the continuity hypothesis (Mathes et al. 2014).

One such dream experience scale is the Dream Intensity Scale. The DIS is a 23-item scale that was designed to measure subjective magnitude of the dreamer beliefs about his/her dreams (Yu, 2012). Its underlying principle is that dream intensity is composed of multiple dimensions and is sensitive to personality traits because it contains multiple scales. The DIS sees dream intensity as being a trait variable; while the content of the dream may shift, how intensely it is experienced will be static. The DIS is divided into four primary scales; Dream Quality, Dream Vividness, Diffusion and Altered Dream Episodes. The Dream Quality scales include variables that measure aspects of regular dream such as frequencies of dream awareness, recall of main content, nightmares and experiencing multiple dreams per night. The Dream Vividness scale is composed of two subscales; Major and Minor Modalities, which measure sensory experiences while dreaming such as smelling, tasting, seeing colors and feeling emotions. The Diffusion Scale encompasses the Dream Work and Paramnesia subscales, which measure cognitive distortions such as condensation and dream-reality confusion. These two subscales necessitate the transference of psychical values and suggest the breakdown in boundaries and the invasion of material between the two conscious systems. The Altered Dream Episodes scale consists of the Lucid Dreaming and Autosuggestion subscales. Lucidity is based on the occurrence of a dreamer experiencing an altered form of the dream experiences such as the dreamer having an awareness that they are in a dream and revisiting a dream that they once experienced and wish to experience again. These subscales have items that inquire about the dreamer's experiences of a break in a dream (waking up) and will then ability to reconnect with dream.

Culture is another variable that may mitigate the relationship between media use and dreams. It can be defined in a variety of way including the measurement of self-construal. Self-construal is a personality dimension that breaks down into independent and interdependent. The collectivist East is seen as more interdependent, valuing group harmony and cooperation, whereas the individualistic West (independent), values personal achievement and self-identity that is separate from others (Lu & Gilmour, 2007). Previous research showed that there is a difference between cultures and dreams by assessing self-construal measures (independent versus interdependent) and dream content. Independent self-construal was significantly related to the dreamer being involved in friendliness while interdependent was more often associated with totally acts of aggression and total social interactions (King & DeCicco, 2007). Yet even within cultures, differences in dream content have been found. For instance, Yin and Shen (2013) found that there is a difference in typical dreams of being chased among the Tibetan and Han Chinese cultures.

In this study we examined culture using the Independent versus Interdependent Self-Construal and self-reports of ethnic background plus reports of first language. We hypothesis that students who identify as being part of a collectivist culture will be higher on interdependent self-construal than students who identify themselves as being part of an individualistic Western or European culture. Furthermore, negative emotions in dreams will have a higher association with higher Social media use and said social media use will be more pervasive among students who score higher as being interdependent. Heavy gaming will be equal among the two Self-Construals but the genre preference will differ; where independent will prefer more actions genre games, interdependent students will favor massively multiplayer online games.

2. Method

2.1. Participants

Canadian participants were students at a western Canadian University, who were solicited from the Introductory Psychology research pool and received course credit for participation. There were 508 research participants who filled out the survey primarily during the 2014 winter semester. Of these 508 surveys, 57 were incomplete and removed from the data analysis. Of the remaining 451 surveys, 135 were filled out by males and 316 females.

2.2. Instruments

2.2.1 Demographics.

Seven demographic aspects were solicited including: sex, education, marital status, city and country of residence, race/ethnicity, occupation, and first language. Questions on sex and marital status were closed ended questions and the remaining were opened ended questions. Ethnicity and first language were combined to create three groups on a continuum from most collectivistic, mixed and most individualistic. The most collectivistic group were students who reported themselves as being collectivist and not having English as their first language. The mixed group were students who reported themselves as being collectivist and English is their first language. Finally, the most individualis-

tic group reported themselves as being individualist and as having English as their first language.

2.2.2 *Media Use Questionnaire.*

Video game play and social media use history were gathered. The video game play questions have been used in previous research in this laboratory (Gackenbach & Rosie, 2009) with validity information offered by Gackenbach and Bown (2011). The social media questions were adapted from a longer scale (Gackenbach & Boyes, 2014) and have been adapted to include Chinese social media as the Chinese Canadians may use these media as well as, or instead of, typical North American social media[1]. The items and categories of each item for this scale are presented in Table 1 in the results section.

2.2.3 *Dream Intensity Scale (DIS; Yu, 2011).*

The DIS has 23-items with an underlying principle that dream intensity is composed of multiple dimensions and is a useful tool for examining general awareness of dreams. The DIS was shown to have good reliability, inter-item correlations and item-scale correlations as well as good convergent and discriminant concurrent validity (Yu, 2010). Yu (2012) conducted study to examine the factorial structure of the DIS and concluded that four higher order and eight lower order factors are highly stable (Yu, 2012, pp. 301). Dream information was gathered using responses to the DIS. This scale breaks down into eight subscales for which scores were computed. These scales and inclusive item topics are listed below (Yu, 2012). Dream Intensity Scale requires participants to indicate their frequencies on a standardized 10-point absolute scale (1 is never to 10 is almost every day) for the 10 point items. The five point items range from 1, never happened, to 5, it happened in almost every one of my dreams. Some specific items are listed in Table 1 in the results section.

1. Regular dreams: dream awareness, recalling main dream content, multiple dreams.
2. Bad dreams: nightmares, nightmare awakening.
3. Major modalities: colors, sounds, emotions.
4. Minor modalities: odors, tastes.
5. Dream work: condensation, displacement, animal symbolism, inanimate object symbolism.
6. Paramnesia: déjà vu, dream-reality confusion.
7. Lucid dreaming: awareness of dreaming, self-scripted dreams.
8. Autosuggestion: reconnecting with dreams, re-experiencing wishful dreams.

2.2.4 *Independent versus Interdependent Self Scales (IISS; Liu & Gilmour, 2007).*

This 42-item scale assesses the degree to which an individual considers themselves as independent or interdependent. Lu and Gilmour conducted a study to investigate the validity and reliability of the Independent and Interdependent Self Scale (IISS) among a Chinese and British sample. The two factor solution with a varimax rotation was imposed in an exploratory factor analysis. A paired t-test showed that Chinese participants scored significantly higher on interdependent self than independent and British participants were significantly higher for independent self than interdependent. This t-test indicated that the IISS has good construct validity. Cronbach's alpha ranged from .83 to .89 for two Chinese and one British sample for both subscales. Overall Lu and Gilmour concluded that the IISS is a reliable and valid measure of self: independent and interdependent.

2.2.5 *Dream Report.*

These were the instructions given to the research participants regarding reporting a recent dream:

> *Please describe your most recent dream. Do this as exactly and as fully as you can remember it. Try to tell the dream story, from beginning to end, as if it were happening again (and without any interpretation or explanation). Your report should contain, if possible, a description of: All the objects, places, characters, and events in your dream; The entire sequence of actions and events, from the beginning to the end of your dream; Your moment-to-moment thoughts and feelings, from the beginning to the end of your dream; and Any unusual, incongruous, or implausible dream thoughts, feelings, objects, places, characters, or events Be sure to report ONLY ONE DREAM. Dialogue box will be provided for up to 1000 words.*

Following this they were asked to report their emotions. Specifically, "Below is a list of emotions that you may or may not have ACTUALLY experienced during your dream. Please indicate the intensity of each which you experienced in the dream just reported. If you did not experience the emotion in your dream then leave that emotion blank." They were asked to report on 15 emotions along a five point intensity dimension ranging from 1 not at all intense through 3 moderately intense to 5 extremely intense. The emotions were: Anger, Awe, Arousal (Sexual), Anxiety, Fear, Guilt, Frustration, Sadness, Hatred, Happiness, Jealously, Embarrassment, Ecstasy, Downhearted, and Terror. These data are part of a larger study and thus are not reported herein.

2.3. Procedure

The survey was posted online through Qualtric.com and participants had access to the survey via the SONA system. When the participants entered the SONA system they were awarded credit and there was no way of identifying participants on the Qualtric data. Surveys did not begin until the participants gave their informed consent. Basic demographic information was gathered first, then participants filled out the Video Game Play and Social Media Use Questionnaire. Yu's Dream Intensity Scale followed the media use survey and a recent dream was then collected. Participants were provided with an empty space to provide a recent dream that they had had, preferably in the past two weeks, and were instructed to provide as much detail about the dream as possible. After, participants were given a list of 15 emotions and asked to rate on a Likert scale how intensely they felt those emotions in the previously recorded dream.. Finally, the interdependent versus independent self-construal scale was administered. Response time for all surveys took about one hour. At the end of the survey there was a question regarding permission to quote their dream and all participants were given a debriefing statement. Analysis of variance on the individual difference and media use variables was followed by series of step-wise regression analysis onto components of the Dream Intensity Scale.

3. Results

Over 508 research participants filled out the survey with most in the winter term of 2014. Of these, 57 were substantially incomplete and removed. The remaining 451 surveys came from 135 males and 316 females from a western Canadian university. Participants ranged in age from 17 years old to 50 years old with a mean age of 20 years old.

Cultural orientation was collected in several ways. First ethic identity and first language were open ended questions, which were coded as Independent/Collectivist and English/not English. These combined to create three groups falling along a continuum of culture with high scores being more collectivist and low being more independent. The majority of the research participants were identified as independent with English as their first language (n=285). The other two groups, however, had sufficient numbers to continue with this variable in the subsequent analyses. 89 individuals were identified as collectivists whose first language was English while another 52 were identified as collectivists whose first language was not English. The second measure of culture was scores on the Independent versus Interdependent Self Scales (IISS; Liu & Gilmour, 2007). Sum scores for the two types of self-construal were computed. Two one-way ANOVA's were computed for ethnic group differences on IISS scores. There were no ethnic group differences for the independent scores but there was a significant group difference for the interdependent score, $F(2,367)=6.121$, $p=.002$, $=.032$, such that the most individualistic ethnic group, independent with English as a first language (mean=96.38; SD=12.34, N=250), had significantly lower interdependent scores on the IISS than the other two groups (collectivist/English M=102.01, SD=15.04, N=75; collectivist/non-English M=100.76, SD=16.03, N=45).

Media use items included both video game play (frequency, length of session, number of games played, age started to play with high number younger, played in the 12 hours prior to filling out the survey and genre preference) and social media use variables (age started to use social media and frequency of use for Facebook, Linkedin, Twitter, Tumblr, Instagram, Myspace, Youtube, Google+, Pinterest,

Table 1. Descriptive statistics for different variables.

Variable	N	Min	Max	M	SD
Sex of subject (Male = 1; Female = 2)	451	1	2	1.7	0.5
Ethnic identification + 1st language Classification[1]	424	1	3	1.4	0.7
Self construal independent sum	417	52	147	110.2	14.8
Self construal collectivist/interdependent sum	423	51	146	98.1	14.3
How often do you typically play video games?[2]	451	1	5	2.2	1.4
How long is your typical playing session?	451	1	8	2.5	1.2
How old were you when you played your first video game? (high number is younger)	449	3	10	8.2	1.2
How many different video games in any format have you played to date?	449	1	5	2.4	1.3
Were you playing a video game in the 12 hours prior to filling out this questionnaire? (1 = yes; 2 = no)	450	1	2	1.8	0.4
Genre presence score	410	70	106	87.0	14.0
At what age approximately did you start using social networking sites? (high number is younger)	450	3	10	6.8	1.0
How frequently do you visit Facebook?[3]	447	1	9	6.0	2.1
How frequently do you visit LinkedIn?	428	1	9	1.1	0.6
How frequently do you visit Twitter?	438	1	9	3.2	2.8
How frequently do you visit Tumblr?	430	1	9	2.1	2.2
How frequently do you visit Instagram?	438	1	9	4.8	3.0
How frequently do you visit Myspace?	426	1	6	1.0	0.3
How frequently do you visit YouTube?	444	1	9	4.2	2.0
How frequently do you visit Google+?	432	1	9	2.8	2.3
How frequently do you visit Pinterest?	431	1	9	2.4	2.1
How frequently do you visit other social media sites?	389	1	9	1.7	1.7

Note. [1](1=independent/English; 2=collectivist/English; 3=collectivist/not English)

[2]Video game frequency ranged from rarely to daily in five categories; typical playing session ranged from zero to 12+ hours in nine categories; age began playing video games ranged from 'in my 50's' to before kindergarten, with high scores being younger, in nine categories; and number of video games played ranged from one to over 100 in five categories.

[3]Frequency of visiting social media sites: less often or never (1), every few weeks (2), 1-2 days a week (3), 3-5 days week (4), about once a day (5), several times a day (6), about every hour (7), several times in an hour (8), pretty much constantly checking (9)

Table 2. Descriptive statistics for Dream Intensity Scale (DIS) variables.

Variable	N	Min	Max	M	SD
DIS regular dreams subscale means[4]	447	1	10	7.1	1.9
DIS bad dreams subscale means	450	1	10	4.0	2.0
DIS major modalities dreams subscale means	446	1	5	4.1	0.8
DIS minor modalities dreams subscale means	444	1	5	1.8	1.0
DIS dream work subscale means	442	1	5	2.1	0.7
DIS paramnesia subscale means	449	1	10	4.4	2.1
DIS lucid dreaming subscale means	451	1	10	3.6	2.2
DIS autosuggestion subscale means	449	1	10	3.9	2.2
DIS total scale score in means	432	2	8	3.9	1.0
DIS03 how often do you experience nightmares?	450	1	10	4.5	2.2
DIS04 how often do you experience nightmares that are so frightening that they wake you up and after awakening are still vivid?	451	1	10	3.5	2.1
DIS06 have you ever become aware or known during a dream that "you are dreaming?"	451	1	10	4.1	2.6
DIS07 have you ever been able to control the contents of your dreams and make things happen in them at will?	451	1	10	3.1	2.4
DIS20 Have any animals capable of speaking or thinking ever appeared in your dreams?	448	1	5	1.8	0.9
DIS21 have any objects (e.g., trees, rocks, etc.) that can speak or think ever / appeared in your dreams?	446	1	5	1.4	0.7

Note. [4]Dream Intensity Scale requires participants to indicate their frequencies on a standardized 10-point absolute scale (1 is never to 10 is almost every day) for the 10 point items. The five point items range from 1, never happened, to 5, it happened in almost every one of my dreams.

Other). Although Chinese social media use information was gathered it is not reported herein as this was part of a larger study of which this inquiry is a component.

The genre of respondent's favourite game was also collected. In add this information into the analysis these preferences were weighted by presence, i.e., the felt sense of being there in the media experience (Gackenbach & Bown, 2011). The games highest in presence were action and adventure genres. The Action genres included first person shooter (FPS) and fighting games. Adventure genres offered in this list of potential favourites were real time strategy and simulation games. Games moderate in presence were role playing games (RPG), including Massively Multiplayer Online Games (MMOG), and sport games. Sport consisted of driving/racing and sport type games. The game lowest in presence was the Casual genre, including puzzle, card and board type games as well as a category called "other type games". Gackenbach and Bown (2011) developed a weighting system for coding presence in each genre such that: Action was weighted as 106; Adventure as 99; RPG as 95; Sport as 82 and Casual as 70. Music/dance games were not classified in the study. If the respondent said they had no favourite genre but indicated that they had played in the last 12 hours and gave the name of the game they were playing, that games genre was used for favourite genre with its accompanying presence score. This accounted for less than six respondents.

While recent dreams were also collected they are not reported herein. Descriptive statistics for the variables of interest are displayed in Table 1 and 2.

3.1. Regression Analysis

The first regression analysis was done on total Dream Intensity Scale (DIS) scores to test the hypothesis that culture and media use would predict Dream Intensity. Sex of subject was also entered into this stepwise regression. The analysis revealed that five variables of the 21 entered variables, one sex, three culture, six video game history, and 11 social media history (see Table 1), were sig¬nificant predictors of total dream intensity. In the order that they were entered, the first was age first began using social media (young), $R2 = 0.042$, $F(1, 353) = 15.31$, $p < .0001$ (adjusted $R2 = 0.39$; Beta=.197); independent self-construal, $R2 = 0.067$, $F(2, 353) = 12.635$, $p < .0001$ (adjusted $R2 = 0.062$; Beta=.150); number of video games played, $R2 = 0.082$, $F(3, 353) = 10.477$, $p < .0001$ (adjusted $R2 = 0.075$; Beta=.232); sex of subject (female), $R2 = 0.118$, $F(4, 353) = 11.635$, $p < .0001$ (adjusted $R2 = 0.108$; Beta=.223); and frequency of using MySpace social media, $R2 = 0.128$, $F(5, 353) = 10.174$, $p < .0001$ (adjusted $R2 = 0.115$; Beta=.100).

In order to determine if these variables differentially predicted different types of dream intensity, the 21 variables assessing culture, media use and sex of subject were entered into separate stepwise regressions for each of the eight DIS subscale scores. Table 3 displays a summary of these results.

Finally, a series of regressions were computed on selected DIS items that have been investigated in previous research on gaming and dreams. These are presented in Table 4.

Table 3. Step-wise Regression Analyses with Predictors, R2 and F-values

Dream Intensity Subscale	Predictors	R^2/adjusted R^2/Beta	F-values, ** p<.0001;* p<.05
Regular Dreams	age first began playing video games (young)	.039/.036/.108	F(1, 353) = 14.359**
	sex of subject (female)	.067/.062/.239	F(2, 353) = 12.695**
	ethnic classification (collectivist)	.094/.083/-.144	F(3, 353) = 11.653**
	number of video game played	.110/.100/.191	F(4, 353) = 10.805**
	age first began using social media (young)	.120/.108/.103	F(5, 353) = 9.508**
Bad Dreams	sex of subject (female)	.040/.038/.286	F(1, 353) = 14.777**
	number of video game played	.068/.063/.198	F(2, 353) = 12.787**
	age first began using social media (young)	.091/.083/.152	F(3, 353) = 11.646**
Major Modalities	age first began playing video games (young)	.028/.025/.178	F(1, 353) = 10.064*
	sex of subject (female)	.046/.041/.137	F(2, 353) = 18.544**
Minor Modalities	number of video game played	.014/.012/.146	F(1, 353) = 5.125*
	frequency checking google+	.026/.021/.112	F(2, 353) = 4.741*
Dream Work	frequency checking other SMU	.028/.026/.163	F(1, 353) = 10.256*
	Self-Construal Independent	.045/.039/.128	F(2, 353) = 8.258*
	age first began using social media (young)	.059/.050/.117	F(3, 353) = 7.258*
Paramnesia	age first began using social media (young)	.066/.064/.256	F(1, 353) = 24.977**
	Self-Construal Independent	.079/.073/.112	F(2, 353) = 14.993**
Lucid Dreaming	frequency checking MySpace	.023/.020/.151	F(1, 353) = 8.184*
Autosuggestion	Self-construal independent	.026/.023/.159	F(1, 353) = 9.335*
	age first began using social media (young)	.050/.045/.157	F(2, 353) = 9.331**

4. Discussion

Students of varying ethnic backgrounds were research participants in this study, which examined the relative role of culture, media use history and sex on self-reported history of dreaming experiences (DIS). Given that these were all students enrolled in a university in Canada the lack of a difference on independent IISS is not surprising. The difference in interdependent scores supports the ethnic groupings variable as conceptualized by self-reported ethnic identity and first language.

Total dream intensity scores were predicted by all three types of variables with three of the five predictors being media use history. This supports previous research where we have examined various media use history variables and their relationship to dreams. Only one of the media use was a video game play history question, number of games played. This variable has been used in our program to identify gaming history groups (summarized in Gackenbach, 2012). In recent years we have taken up the question of social media use associations to dreams based on the work of Cirucci (2013) who argues that social media users should be studied the same as video game players. Gackenbach and Boyes (2014) report that the high video game play and high social media use group had the thinnest psychological boundaries, as measured by Hartmann's short version of the Boundary Questionnaire (Hartmann, 1989), and thus were perhaps most susceptible to media effects. While at the same time this group of high end media users showed the least negative self concepts in their recent dream content. The two social media use variables that entered into this regression predicting total dream intensity scores were age began using social media (i.e., high scores being younger) and frequency of using MySpace. Of course the question becomes why this one social media variable when several were entered into the regression analysis and many of those were more widely used. It could be that, while Facebook is more unbiquitous in its use among college students, given the age starting social media use and this older social media website may combine to indicate longer use of social media and thus more perception of affects on dreams. This is somewhat in line with Lambrecht et al. (2013) finding of more time in daily activities, including TV viewing, the more effects on dreams. Additionally, while MySpace is certainly past it's peak it offers ease of access to music and other multimedia that may not be the case in Facebook. Additionally, in correlations attempting to understand this unique prediction by MySpace users for lucid dreams, it was correlated with Facebook use, as were most of the social media.

Table 4. Regression Analysis for Selected Dream Intensity Scale Items

Dream Intensity Subscale	Predictors	R^2/adjusted R^2/Beta	F-values, ** p<.0001;* p<.05
DIS03 nightmares	sex of subject (female)	.034/.031/.240	F(1, 353) = 12.430**
	age first began using social media (young)	.056/.050/.150	F(2, 353) = 10.339**
	number of video game played	.075/.068/.099	F(3, 353) = 9.521**
	Self-Construal Independent	.086/.075/.133	F(4, 353) = 8.178**
	Self-Construal interdependent (collectivist)	.096/.083/-.109	F(5, 353) = 7.422**
DIS04 nightmares that awaken	sex of subject (female)	.036/.033/.282	F(1, 353) = 13.017**
	number of video game played	.067/.062/.210	F(2, 353) = 12.613**
	age first began using social media (young)	.084/.076/.132	F(3, 353) = 10.737**
DIS06 lucid dreams	frequency checking MySpace	.013/.010/.112	F(1, 353) = 4.507*
DIS07 control dreams	frequency checking MySpace	.025/.022/.154	F(1, 353) = 9.078*
	number of video game played	.037/.031/.107	F(2, 353) = 6.666*
DIS20 animals speak/think	frequency checking other social media	.023/.021/.145	F(1, 353) = 8.402*
	frequency of playing video games	.039/.033/.125	F(2, 353) = 7.101*
DIS21 objects speak/think	frequency of playing video games	.038/.035/.185	F(1, 353) = 13.836**
	frequency checking other social media	.061/.056/.152	F(2, 353) = 11.388**

However, MySpace use was significantly, if low magnitude, correlated with Tumblr (r (424)=.114, p=.019) which is also a multimedia platform for microblogging, and with Google+ (r (424)=.119, p=.015). The latter is thought to be a bit more sophisticated than Facebook in terms of sharing ideas rather than catching up with friends (Bosker, 2011). These observations seem to paint a picture of a preference for an older social media forum, by individuals who may be more musically inclined, and informed than the other social media user profiles. Correlations to other individual difference variables available in this data set (sex, marital status, self construal, ethnic identity) were not significant.[2]

In order to examine a more refined view of dream intensity the author's subscale scores were derived (Yu, 2010) and the same culture, media use and sex variables were entered into each regression. Interestingly, predictors for six of the eight regressions were 'age began either playing video games or using social media' and three had 'number of video games played' as a predictor. Only three of the eight regressions had 'sex of subject (female)' as a predictor. Half of the regressions had one of the three culture variables entered. The first subscale score is essentially a dream recall estimate and included all three types of variables. The bad dreams subscale score did not have any of the culture variables predicting these scores nor did the major or minor modality subscales. However, culture independent self-construal, were important in predicting dream work, paramnesia and autosuggestion subscale scores. Finally, frequency of checking MySpace social media was the only variable that predicted the lucid dreaming subscale score. While the regular dreams (i.e., dream recall) subscale was effectively predicted by the same variables as the total DIS score, when different types of dreams were considered slightly different patterns emerged.

The final regressions were on selected specific items from the DIS that had been examined in previous research in our laboratory - two nightmare items, two lucid type items, and two bizarreness type items. Previously, we found partial support among subjects with a history of playing video games for less frequent or less threatening nightmares (Gackenbach et al., 2011), more lucid (Gackenbach & Rosie, 2009; Kuruvilla, 2013) and more control dreams (Gackenbach & Boyes, 2014), and more bizarreness (Gackenbach & Dopko, 2012). These findings have been replicated across studies, although not consistently (summarized in Gackenbach, 2012). The third set of regressions examined sex, media use history, and culture predictors for those specific items from the DIS. Unsurprisingly the pattern of results echoed those found in the previous two sets of regressions. Culture and sex only factored into predicting nightmares along with two media use variables. Culture and sex, however, did not enter into the predictions of lucidity or bizarreness items. Lucid/control items both had the MySpace frequency as a predictor although it did not predict either of the bizarreness item scores. The bizarreness items were predicted by frequency of gaming and checking other types of social media. While other social media experiences are not known, given its association to frequency of gaming it may be that the other social media are gaming platforms, which were not individually asked about in this survey.

4.1. Limitations and Conclusions

One of the studies primary limitations is lack of cultural and sex diversity. While we were able to consider students with differing cultural backgrounds, the majority of the respon-

dents were from individualistic cultures, namely Canada, with English as a first language. Most were also female. Increased cultural diversity and a higher percentage of men would aid in future anlaysis. To this end, this same study is currently being run in three Chinese universities. Next, the lack of information about gaming social media is an additional weakness. Finally, the DIS scale had some poorly worded items, which may have come from it's being originally developed in Chinese and perhaps the translation from Chinese to English was problematic.

In conclusion, the role of sex and culture relative to history of media use in predicting DIS scores is strongest with total DIS scores and the dream recall and nightmare information. The idea that females report more dreams and more nightmares is consistent with what is often reported in the literature (Schredl, Kim, Labudek, & Schadler, 2013). Media use was also a component of these two dimensions but stronger for the other DIS information. In general the findings with social? media seem to fall around 'age began using social media and gaming' and 'use of MySpace', one of the first social media sites and thus presumably used the longest. These findings support Lambrecht et al.'s (2013) continuity hypothesis of dreaming and in terms of high frequency results in more incorporation.

Notes

[1]This is a part of a larger study examining Chinese versus Canadian media use (Gackenbach, Lee, Gahr, & Yu, 2013).

[2]It should be noted that age was not gathered within this sample, but the information was from the same population obtained in the same term in another study from our lab.

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