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To cite this article: Scott Deatherage MS , Heather L. Servaty-Seib PhD & Idil Aksoz BA (2014) Stress, Coping, and Internet Use of College Students, Journal of American College Health, 62:1, 40-46, DOI: [10.1080/07448481.2013.843536](https://doi.org/10.1080/07448481.2013.843536)

To link to this article: <https://doi.org/10.1080/07448481.2013.843536>



Accepted author version posted online: 20 Sep 2013.  
Published online: 07 Dec 2013.



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## Major Article

# Stress, Coping, and Internet Use of College Students

Scott Deatherage, MS; Heather L. Servaty-Seib, PhD; Idil Aksoz, BA

**Abstract.** College students experience stressful life events and little research exists on the role the Internet may play in students' coping. **Objective:** The purpose of the present study was to examine associations among perceived stress, time spent on the Internet, underlying motives for utilizing the Internet, problematic Internet use, and traditional approaches to coping. **Participants:** Data were collected from 267 college seniors during March of 2011. **Methods:** Participants completed an online survey containing measures of coping, motives for utilizing the Internet, problematic online behavior, perceived stress, and background information. **Results:** Being female, avoidant-emotional coping, and online motive to cope were positively associated with perceived stress and months since most stressful life event and online motive to enhance were negatively associated with stress. **Conclusions:** Professionals working with college students will benefit from using a nuanced approach to assessing students' online behavior, including an assessment of underlying motives for use.

**Keywords:** college students, coping, Internet use, stress

Many college students experience adverse life events (ALEs; eg, deaths of loved ones, parental divorces, romantic break-ups) while in college.<sup>1</sup> Students' reactions to these difficult experiences can vary widely from stress, depression, anxiety, to suicidal ideation.<sup>2-4</sup> One explanation for the variation in reactions to stressful life events is different approaches to coping.<sup>5</sup> Researchers, following the lead of Lazarus and Folkman,<sup>6</sup> frequently group coping strategies into 3 categories, problem-focused (eg, engaging in behaviors to address a problem), active-emotional (eg, venting), and avoidant-emotional (eg, denial). Problem-focused coping is often considered the more adaptive approach<sup>7-9</sup> because, in contrast to emotion-focused

coping, it emphasizes action; action targeted toward change. However, research also suggests that the use of a combination of both emotion- and problem-focused coping approaches may be more adaptive than either alone.<sup>7,10</sup>

Of interest is the idea that relatively little current research exists on the role that the Internet may play in the coping and coping approaches used by college students. Today's college students highly value the Internet and have integrated it into all aspects of their lives, including school, work, and leisure activities.<sup>11,12</sup> In fact, the 2011 Cisco Connected World Technology Report<sup>13</sup> indicated that roughly 80% of college students perceive the Internet to be "close to" or "as vital" as air, water, food, and shelter.

The research that does exist suggests that Internet use may be both a source of stress and also a useful means of coping with stress. Kraut et al<sup>14</sup> found time spent on the Internet to be positively associated with levels of depression and social anxiety and negatively associated with family communication; however, Kraut et al<sup>15</sup> found that time on the Internet was positively associated with communication, social involvement, and overall well-being. This type of discrepancy has been indicated in other studies,<sup>16,17</sup> suggesting the need for a more nuanced approach to examining the relationship between Internet use and stress for college students. One such approach is to look beyond the *amount* of Internet use to also examine students' *motivations* for using the Internet.

Research suggests that individuals' motivations to access the Internet are associated with different Internet activities (eg, entertainment, communication). Atkinson and Kydd<sup>18</sup> found that college students' intrinsic motivation (ie, driven by interest and enjoyment that exists within a person) was predictive of using the Internet for entertainment purposes. Conversely, the investigators found that extrinsic motivation (ie, driven by gain of an external reward or outcome) was predictive of using the Internet for homework or other course-related purposes. Further, Muscanell and Guadango<sup>19</sup> found that male college students are more likely to access the

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Internet when motivated to extend their social networks. Additionally, female college students were more likely to utilize the Internet to maintain extant relationships. Although the research regarding differences in underlying motivations to access the Internet is scant, significant differences in Internet activities have been found when underlying motivations are assessed. However, research is needed to determine which types of underlying motivations (eg, coping, entertainment) may be differentially associated with college students' perceived stress.

Another useful direction within the scholarship on college student Internet use has been a focus on *extreme* Internet use and the attempt to distinguish use that is problematic from use that is normative. Research has indicated positive associations between problematic Internet use (ie, any use of the Internet that creates psychological, social, school, or work difficulties in users' lives<sup>20</sup>) and negative outcomes such as Internet addiction, depression, increased loneliness, procrastination, and sleep loss.<sup>21,22</sup> Mitchell et al<sup>23</sup> developed The Index of Problematic Online Experiences and defined problematic Internet use as use that interferes with intrapersonal (eg, embarrassed by use), interpersonal (eg, lost friends), and daily (eg, lost sleep) functioning and/or creates legal or work-related difficulties. An important next step is to combine this attempt to capture problematic use with a focus on students' motivations for Internet use.

The purpose of the present study was to examine potential associations among perceived stress, time spent on the Internet, underlying motives for engaging in Internet use, problematic Internet use, and traditional approaches to coping. More specifically, we were interested in testing the following research question: Do online motivations (eg, coping, entertainment) and online experiences (eg, time online, problematic activity) statistically predict levels of perceived stress above and beyond more traditional coping strategies (ie, problem-focused, active-emotional, avoidant-emotional)? Based on previous research, we predicted that problem-focused coping would be a negative predictor of stress and emotion-focused coping would be a positive predictor of perceived stress. In addition, we hypothesized that problematic online activity would be a positive predictor of stress and that different online motives would differentially predict stress. Because online motives had not been examined in the way that we attempted, we did not have specific hypotheses about the direction of prediction.

## METHODS

### Participants and Procedure

A sample of 267 college seniors with a mean age of 22.44 ( $SD = .92$ ) participated in this study. Seniors were included to ensure participants were comfortable in the campus setting and that the adverse life events (ALEs) identified occurred during college. The majority of the participants were female ( $n = 165$ ; 61.8%) and white ( $n = 239$ ; 89.5%). The average number of ALEs experienced within the previous 2 years by the participants was 4.25 ( $SD = 2.28$ ). The ALEs identified

as the *most stressful* (>5%; within the past 2 years) were financial problems ( $n = 144$ ; 17.23%), academic setback ( $n = 123$ ; 15.73%), romantic breakup ( $n = 104$ ; 14.2%), death of family member/friend ( $n = 107$ ; 12.4%), conflict with partner/friend/family member ( $n = 143$ ; 10.1%), injury/illness of self ( $n = 57$ ; 6.4%), and injury/illness of other ( $n = 70$ ; 6%). The average time since the most stressful ALE was 9.96 months ( $SD = 7.96$ ). Participants reported spending an average of 15.47 hours ( $SD = 9.01$ ) online per week.

A random sample of college seniors from a large, public university in the Midwest received an e-mail from the registrar's office that included a brief introduction and link to the study survey. Interested participants were then directed to an information letter describing the nature and purpose of the study and were required to select "I would like to participate in this study" if they chose to participate in the current study. Participants were asked to complete all survey items while reflecting on their most stressful ALE in the past 2 years and were offered the option of being entered into a drawing for 1 of 4 electronic gift certificates. The methods of the present investigation were reviewed and approved by the institutional review board of the university in which the data were collected.

## Measures

### Coping

The Brief COPE<sup>24</sup> is a 28-item instrument with 14 subscales that assesses one's tendency to utilize different coping strategies. It is parsimonious with the full COPE measure<sup>25</sup> and has been utilized with college students. Using both the conceptual and empirical coping literature, Schnider et al<sup>8</sup> grouped the 14 subscales into 3 categories of coping style tendencies: problem-focused (eg, active planning, engaging in behavior to address the problem such as asking help from others or finding new strategies to address the perceived problem), active-emotional (eg, venting, trying to view the problem differently), and avoidant-emotional (eg, denial, purposeful distraction from the problem such as focusing on work or watching TV). Participants answered items using a 4-point scale (1 = *I haven't been doing this at all* to 4 = *I've been doing this a lot*). Utilizing a college student sample, Schnider et al<sup>8</sup> reported Cronbach's alpha coefficients on problem-focused coping (.80), active-emotional coping (.81), and avoidant-emotional coping (.88). Cronbach's alpha coefficients for scores using the current sample were as follows: problem-focused (.83), active-emotional (.83), and avoidant-emotional (.77) coping.

### Online Motives

An online motives questionnaire was used to assess participants' motivations for going online. The questionnaire was developed by the authors through altering items from the Drinking Motives Questionnaire-Revised (DMQ-R).<sup>26</sup> The DMQ-R, derived from Cox and Klinger's<sup>27</sup> conceptual model, consists of 4 subscales with a total of 20 items (ie, rating on 5-point scale) that assess motivations to consume

alcoholic beverages. The 4 subscales include 2 that assess motivation to regulate negative affect: to cope (ie, getting online to assist transition after a stressor, “to cheer up when I am in a bad mood”) and to conform (ie, getting online to establish oneself as part of a group, “to fit in with a group I like”). The remaining 2 subscales assess motivation to regulate positive affect: to socialize (ie, getting online to participate in ceremonial or social situations, “to celebrate a special occasion with friends”) and to enhance (ie, getting online to increase positive affect and experience, “because it is fun”). Higher scores on the various subscales indicate a greater tendency to utilize the Internet for the described purpose. Alterations to the questionnaire included changing the initial prompt “I drink. . .” to “I get online. . .” and also making minor adjustments to 4 of the items in order to maintain consistency with the author’s original intent. The validity of these revisions was checked by a broader team of researchers and the reliability was confirmed as acceptable by the internal consistency of scores using the current sample. For example, Cooper’s<sup>26</sup> original item “to get high” was edited to the new item: “to get a rush.” Participants answered items using a 5-point scale (1 = *almost never/never* to 5 = *almost always*). In its original form (ie, to assess motivations to consume alcohol), the DMQ-R exhibited Cronbach’s alphas in a college student sample as follows: cope (.81), conform (.78), socialize (.86), and enhance (.87).<sup>28</sup> Cronbach’s alphas for scores using the current sample were as follows: cope (.83), conform (.68), socialize (.86), and enhance (.81). Scores for each subscale range from 5 to 25 (out of a highest possible of 25 for each). Ranges for the current sample were as follows: cope, 5–23; conform, 5–15; socialize, 5–25; and enhance, 5–21.

### Problematic Online Behavior

The Index of Problematic Online Experiences (I-POE)<sup>23</sup> is a 26-item instrument with 6 subscales that assess a broad range of problematic Internet experiences and behaviors during the previous year. The subscales, containing between 3 and 6 items each, include (a) overuse; (b) problems with family or friends (ie, concern expressed by friends or family); (c) problems with daily obligations (ie, failing to fulfill one’s basic roles); (d) problems related to interactions with people online (ie, being deceived by, having arguments with, or losing money or property to those met on the Internet); (e) upset or concern about own Internet use (ie, negative emotions regarding Internet use); and (f) online behavior concerns (ie, deceiving others or trouble with the law regarding activities while on the Internet). For the purposes of the current study, only the total score was used. The use of the total score is consistent with the development of the measure, as the authors suggested using only the total score when the interest is in determining overall problematic Internet use and not specific domains of problematic Internet use. Participants answered items using a dichotomous, yes/no format (0 = *no* and 1 = *yes*), with high scores indicating more problematic use. The scale authors originally created the measure to be an exploratory assessment tool that can provide general information to clinicians regarding college students’ Internet

use; they did not provide a specific cutoff score. No past information regarding reliability of the I-POE could be found; however, the authors<sup>23</sup> reported construct validity in the form of significant positive associations between I-POE total score and variables such as depression, anger, sexual concerns, dysfunctional sexual behavior, and amount of Internet use. Cronbach’s alpha for scores using the current sample was .64; acceptable for a true/false type measure. Scores ranged from 0 to 11 (out of a highest possible of 26).

### Perceived Stress

The Perceived Stress Scale (PSS) is an instrument commonly used to measure the perception that situations in one’s life during the previous month are appraised as stressful.<sup>29</sup> Three versions of the scale exist, including 14, 10, or 4 items, each with comparable internal consistency. The abbreviated PSS-10 was used in this study to measure perceived stress. Participants answered items using a 5-point scale (from 0 = *never* to 4 = *very often*). Past internal consistency for scores on the 10 item version of measure have been at .70 or above.<sup>30</sup> Cronbach’s alpha obtained for scores using the current sample was .92.

### Data Analysis

In order to determine possible significant associations between the background/demographic variables and perceived stress, we calculated Pearson correlation coefficients. Then, we conducted a hierarchical regression analysis to examine the relationships among all of the independent variables (ie, sex, number of ALEs, months since ALE, coping strategies, average hours online per week, online motives, and problematic Internet use) and perceived stress. Statistical analyses were performed using SPSS 20 (SPSS, Chicago, Illinois).

As indicated in Table 1, the background/demographic variables of number of adverse life events and months since the most stressful ALE were both significantly associated with perceived stress.

### RESULTS

An independent-samples *t* test was conducted to assess for possible sex differences on perceived stress. The results indicated that there was a statistical significant difference in perceived stress scores with women ( $M = 20.97, SD = 6.914$ ) scoring higher than men ( $M = 18.68, SD = 6.59; t(264) = -2.66, p < .05$ ). Past research indicates strong empirical evidence for college women reporting higher levels of stress than their male peers.<sup>31</sup> Therefore, all 3 of the variables were included in step 1 of the regression analysis.

In the model of hierarchical regression (see Table 2), the statistical prediction of perceived stress by sex, number of ALEs, months since ALE, coping strategies (ie, problem-focused, active-emotional, avoidant-emotional), average hours online per week, online motives (ie, to cope, to conform, to socialize, to enhance), and problematic Internet use was tested. In the first step of the regression, sex, number of ALEs and months since the most stressful ALE were

**TABLE 1. Intercorrelations Among Background/Demographic and Primary Study Variables**

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Sex	—												
2. No. of adverse life events	.05	—											
3. Months since ALE	.00	.07	—										
4. Problem-focused coping	.17**	.04	-.03	—									
5. Active-emotional coping	.19**	.15*	.01	.56**	—								
6. Avoidant-emotional coping	.02	.38**	.05	.04	.26**	—							
7. Average hours online/week	.03	-.01	-.03	.08	-.00	-.02	—						
8. Online motive: to cope	-.00	.06	-.11	.09	.14*	.26**	.09	—					
9. Online motive: to conform	.06	.05	.00	.12*	.20**	.25**	.07	.42**	—				
10. Online motive: to socialize	.05	.02	-.04	.17**	.25**	.14*	.04	.49**	.53**	—			
11. Online motive: to enhance	-.01	.04	-.07	.15*	.17**	.13*	.06	.60**	.38**	.57**	—		
12. Problematic Internet use	-.13*	.14**	-.07	-.02	-.01	.23**	.06	.40**	.18**	.14*	.31**	—	
13. Perceived stress	.16**	.25**	-.14*	-.06	-.04	.46**	.02	.25**	.05	.01	-.02	.21**	—

\* $p < .05$ ; \*\* $p < .01$ .

entered and the model was significant,  $R^2 = .112$ ,  $F(3, 263) = 11.054$ ,  $p < .001$ . All 3 variables were significant predictors of perceived stress. Individually, sex (ie, being female) and number of life events were positive predictors of stress and time since the most stressful ALE was a negative predictor.

After controlling for the background/demographic variables in the first step, the second step of the analysis included the traditional coping strategy variables. The second model was also significant,  $R^2 = .310$ ,  $F(6, 260) = 19.439$ ,  $p < .001$ , with sex (ie, being female) and avoidant-emotional coping as positive predictors of stress and months since the most

**TABLE 2. Predictors of Perceived Stress**

Predictor	Perceived stress								
	$R^2_{\text{Change}}$	$F_{\text{Change}}$	$R^2_{\text{Total}}$	$F_{\text{Total}}$	$B$	$SE$	$\beta$	$t$	$sr^2$
Step 1			.112	(3, 263) = 11.054**					
Sex					2.106	.811	.151	2.596**	.151
No. of adverse life events					.774	.176	.257	4.408**	.256
Months since ALE					-.142	.050	-.165	-2.827**	-.164
Step 2	.198	24.820	.310	(6, 260) = 19.439**					
Sex					2.685	.735	.193	3.653**	.188
No. of adverse life events					.326	.168	.108	1.941	.100
Months since ALE					-.152	.045	-.177	-3.414**	-.176
Problem-focused coping					.008	.085	.006	.099	.005
Active-emotional coping					-.276	.082	-.219	-3.353**	-.173
Avoidant-emotional coping					.659	.079	.478	8.308**	.428
Step 3	.061	4.128	.371	(12, 254) = 12.485**					
Sex					2.809	.717	.202	3.917**	.195
No. of adverse life events					.317	.164	.105	1.936	.096
Months since ALE					-.130	.044	-.151	-2.996**	-.149
Problem-focused coping					.025	.083	.019	.308	.015
Active-emotional coping					-.252	.081	-.200	-3.104**	-.154
Avoidant-emotional coping					.595	.081	.431	7.356**	.366
Average hours online/week					.003	.038	.004	.075	.004
Online motive: to cope					.434	.109	.276	3.980**	.198
Online motive: to conform					-.265	.183	-.089	-1.454	-.072
Online motive: to socialize					-.008	.116	-.004	-.066	-.003
Online motive: to enhance					-.360	.116	-.213	-3.107**	-.155
Problematic Internet use					.235	.158	.084	1.483	.074

\* $p < .05$ ; \*\* $p < .01$ .

stressful ALE and active-emotional coping as negative predictors. Finally, in the last step of the analysis, average hours online per week, online motives and problematic Internet use variables were added after controlling for the demographic and coping strategy variables. The results indicated that the third model was also significant,  $R^2 = .371$ ,  $F(12, 254) = 12.485$ ,  $p < .001$ . As in step 2, sex and avoidant-emotional coping remained as positive predictors of stress and months since the most stressful ALE and active-emotional coping remained as negative predictors of stress. In addition, the online motive to enhance emerged as a negative predictor of perceived stress and the online motive to cope emerged as a positive predictor of perceived stress. Neither number of hours online per week nor problematic Internet use predicted perceived stress.

### COMMENT

Overall, our findings confirm the potential usefulness of examining online motives in order to address the more nuanced relationships that exist between online behaviors and college students' perceived stress. More specifically, although students' *coping*-related motives to go online were positively associated with stress, their *enhancement*-related motives were negatively associated with stress. Going online because it is exciting and fun is connected with lower stress and going online because it helps with stress relief and to forget about problems is connected with higher stress. The design of our study does not allow for statements regarding causation but the distinction between these findings is meaningful. Just as Atkinson and Kydd<sup>18</sup> found differences in the type of Internet use as a function of intrinsic versus extrinsic motivation, we found that different motivations for going online (ie, coping vs enhancement) were related to different levels of perceived stress. Taken together with the fact that the number of hours/week spent online was *not* associated with perceived stress, these findings highlight the need for college student personnel to thoroughly assess students' *motives* for engaging in online behaviors beyond basic questions about the amount of use. In addition, the bulk of research on college student Internet use has used a problematic and/or addiction-based focus and additional research is needed that incorporates a more nuanced view of the complexities of how, why, and when students use the Internet.

As hypothesized, avoidant-emotional coping was significantly and positively associated with perceived stress. In contrast, active emotion-focused coping emerged as a negative predictor of perceived stress and problem-focused coping was not a predictor of stress. These disparate findings are interesting based on past research that has indicated general emotion-focused coping to be positively associated with maladaptive functioning and negative affect for college students,<sup>7,10</sup> and highlight the importance of examining active and avoidant emotion-focused coping as distinct constructs. Students in the current study were asked to recall the coping strategies they used with their *most stressful* ALE in the past 2 years so it may be that the benefits of active-emotional coping (eg, venting) and hindrances of avoidant-emotional

coping (eg, denial) were heightened through this emphasis and specificity. In addition, some scholars have suggested that task approaches (ie, focused on actions to be taken) such as problem-focused coping (eg., engaging in help-seeking behaviors, intentionally trying to improve the situation) may be most common and effective in the early stages of a stressful experience and that emotional approaches may be used after task-based approaches prove ineffective.<sup>32</sup>

In contrast to our hypothesis, problematic online behavior was *not* a significant predictor of perceived stress. The I-POE is a measure of pathological online activity and as such it may not be associated with the normative assessment of stress we used. In addition, scores on the I-POE did indicate a restriction of range, as many of the items are extreme and unlikely to be endorsed by most college students (eg, "Have you seen any Web sites featuring weapons, bombs, or other violent material that you wanted to make or act out in real life?" and "Have you been arrested or in trouble with the law for something you did on or through the Internet?"). Another potential explanation for the restricted range or underreporting could be the influence of social desirability, as these more extreme items are unlikely to be viewed favorably by society.

Although we did not make hypotheses regarding sex, number of ALEs, or time since the most recent ALE, these variables emerged as having significant associations with stress. These findings are consistent with past research indicating that college women report greater levels of stress than their male peers,<sup>31</sup> and that the number of ALEs experienced is positively associated with poor outcomes.<sup>1</sup> In addition, time since a stressful ALE has also been found to be negatively associated with anxiety<sup>33</sup> and grief<sup>8</sup> for college students.

Professionals working in the area of college student health can use the present findings in their outreach and psychoeducational programming and also in their individual interactions with college student patients. With regard to outreach and psychoeducational efforts, health professionals can develop and deliver programming that is solidly built upon a more nuanced understanding of the complexities of students' interactions with the Internet. Assumptions cannot be made or implied in communicating with students about how their Internet use could be associated with their levels of stress. Rather, health professionals can educate students regarding the *motivations* behind their use of the Internet and facilitate conversation regarding when and how Internet use may be more or less likely to be associated with stress. With regard to individual patient interactions, it is worthwhile for those interested in promoting health to routinely assess students' use of the Internet (eg, How often do you go online? Why do you usually go online? What feelings do you generally have while using the Internet?). Students view the Internet as a vital part of their life<sup>13</sup> and it is common for students to be accessing the Web even in health center waiting rooms while waiting for their names to be called. Patients will benefit from questions that allow them to dynamically consider the when, how, and why of their Internet use in possible connection with their stress levels. Health professionals who communicate a sense of understanding regarding the central nature of

the Internet in the lives of college students will have more opportunities to talk with students about the motives for using the Internet that are likely to be positively and negatively associated with students' perceived stress.

### Limitations

The current findings must be considered in light of a number of limitations. First, generalizability of the findings is limited due to the sampling method (ie, convenience sampling) and the resulting homogenous sample, varying minimally by factors such as age and race/ethnicity. Second, our use of a self-report measure of problematic Internet use may have masked problems more easily identified by third parties. In addition, the I-POE may not have been related to stress because of its pathological rather than normative focus. We also used the total score, which did not allow for detection of possible differences based on subscale scores. In addition, the I-POE was administered as the final measure, which could have contributed to the low variance in responses. However, the benefit of administering the I-POE last was that responses to the measure were not likely to have influenced responses to earlier items in the questionnaire. Lastly, the cross-sectional nature of the study precludes causal inferences. Future research using longitudinal designs and even greater specificity regarding students' online activities and motivation would add to the literature. Many questions remain, such as: Are there associations among specific types of online activity (eg, Facebook) and certain motives for going online (eg, social, coping) for college students? If yes, which combination of activities and motivations is most associated with stress and/or more adaptive outcomes such as life satisfaction and social connectedness?

### Conclusions

The present study provides much to consider for those working with college students on a daily basis and for those engaged in research related to college student stress and Internet use. On the most basic level, it challenges possible assumptions that the number of hours spent online is related to students' overall levels of stress. Our findings indicate the need for a more nuanced approach to assessing students' Internet use; more specifically, a careful consideration of students' underlying motives for going online. Students who engage in Internet use to cope with and likely to avoid the problems in their lives are likely to experience higher levels of stress, whereas those who go online to enhance their lives, experience positive affect, and to vent are more likely to experience lower levels of stress.

### FUNDING

No funding was used to support this research and/or the preparation of the manuscript.

### CONFLICT OF INTEREST DISCLOSURE

The authors have no conflicts of interest to report. The authors confirm that the research presented in this article met the ethical guidelines, including adherence to the legal

requirements, of the United States and received approval from the Institutional Review Board of Purdue University.

### NOTE

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Received: 21 January 2013  
Revised: 27 August 2013  
Accepted: 9 September 2013