The association between financial literacy and Problematic Internet Shopping in a multinational sample

Lawrence T. Lam[a,b,*], Mary K. Lam[b]

[a] Tung Wah College, Hong Kong, China
[b] University of Technology Sydney, Faculty of Health, Australia

ARTICLE INFO

ABSTRACT

Purpose: To examine the association between financial literacy and Problematic Internet Shopping in adults.
Methods: This cross-sectional online survey recruited participants, aged between 18 and 60 years, through an online research facility. The sample consisted of multinational participants from mainly three continents including Europe, North America, and Asia. Problematic Internet Shopping was assessed using the Bergen Shopping Addiction Scale (BSAS). Financial Literacy was measured by the Financial Literacy subscale of the Financial Wellbeing Questionnaire. Multiple linear regression analyses were conducted to elucidate the relationship between the study and outcome variables with adjustment for other potential risk factors.
Results: Of the total of 997 respondents with an average age of 30.9 (s.d. = 8.8), 135 (13.8%) could be classified as having a high risk of being Problematic Internet Shoppers. Results from the multiple regression analyses suggested a significant and negative relationship between financial literacy and Problematic Internet Shopping with a regression coefficient of -0.13, after controlling for the effects of potential risk factors such as age, region of birth, employment, income, shopping frequency, self-regulation and anxiety ($t = -6.42$, $p < 0.001$).
Conclusions: The clinical management of PIS should include a financial counselling as a component of the treatment regime. Enhancement of financial literacy in the general population, particularly among young people, will likely have a positive effect on the occurrence of PIS.

1. Introduction

Since the inclusion of "Internet Gaming Disorder" in Section III of the Diagnostic and Statistical Manual of Mental Disorders-5th Edition (DSM-5) (American Psychiatry Association, 2013). "Internet Addiction" has drawn much attention from many fields of academia, including the study of genetics (Leeman & Potenza, 2013). Shopping is included among the spectrum of different Internet-related behaviours (Karim & Chaudhri, 2012). However, Problematic Internet Shopping (PIS), in comparison to other behaviours, is an understudied area that requires more attention due to its financial implications (Duroy, Gorse, & Lejoyeux, 2014).

In comparison to another problematic behaviour of a similar nature, namely Compulsive Buying which is also not included in the DSM-5 as an addictive behaviour, different thoughts have been presented (American Psychiatry Association, 2013). Black used the term "Compulsive Buying Disorder (CBD)" to describe the problematic behaviour and defined it as: "excessive shopping cognitions and buying behaviour that lead to distress or impairment" (Black, 2007). In the exploration of

the Internet-based shopping behaviour as a potential addictive behaviour, Rose and Dhandayudham argued that the differences in compulsive buying between online and offline were little (Rose & Dhandayudham, 2014). They also advocated the model of the "Online Buying Addiction" that was, by and large, based on the CBD model propounded by Black (Rose & Dhandayudham, 2014). On the other hand, it could be argued that in terms of some cognitive aspects of a consumer, such as searching for the product, planning for the purchase, and the anticipation of procession, and the impact on individuals' personal, social, and familial life, there are little differences between these behaviours. However, again from the consumption perspective the different modes of purchase, being online and offline, would provide different shopping experiences for example the access to the product with physical handling could allow the purchaser an immediate gratification whereas for online shopping consumers could only enjoy a visual sensation and the gratification coming with the procession of the product will be delayed, although in both cases a relief of anxiety could equally be achieved with the purchase.

In terms of risk factors of PIS, a French study on the characteristics

* Corresponding author at: Tung Wah College, 31 Waylie Road, Homantin, Kowloon, Hong Kong, China.
E-mail addresses: Lawrence.Lam@uts.edu.au, LawrenceLam@twc.edu.hk (L.T. Lam).

of Problematic Internet Shoppers among university students in Paris suggested that they were more likely to prefer to shop online because of exhaustive offers and an immediate positive feeling, as well as demonstrating a willingness to spend money and time shopping online (Duroy et al., 2014). Rose and Dhandayudham had also reviewed the literature and identified a list of variables as potential risk factors of PIS. These included: the female gender, low self-regulation, negative emotional state, positive feeling, and negative cognitive state (Rose & Dhandayudham, 2014). Brand et al., also proposed a comprehensive explanatory framework for the development and maintenance of Problematic Internet Use behaviour via their Interaction of Person-Affect-Cognition-Executive model (I-PACE) (Brand, Young, Laier, & Wölfling, 2016). In the proposed model the various factors were suggested for each domain of model such as personal characteristics in the Person domain; affective and cognitive responses to certain situations in the Affect-Cognition domains; and factors relating to executive function in the Executive domain (Brand et al., 2016). The I-PACE model is a process model describing how the possible risk or protective factors may exert their influence in the process of driving an individual towards the use, as well as maintaining the use of the Internet (Brand et al., 2016). Problematic use of the Internet, including PIS, is a consequence of the interactions among various risk and protective factors that are involved in the process pathway. These factors may serve as the predisposition factors, such as neurobiological and psychological constitutions of the individual, or as mediating factors, such as cognitive appraisal to an external stimulus, or as moderating factors, for example the coping style (Brand et al., 2016).

Financial Literacy (FL) has been defined slightly differently by various sources (Australian Government, 2017; OECD, 2012; United States Government Accountability Office, 2012). The International Network of Financial Education (INFE) of the OECD defined FL as: "a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing" (OECD, 2012). Whereas, the U.S. Government defined FL as: "the ability to make informed judgments and to take effective actions regarding the current and future use and management of money" (United States Government Accountability Office, 2012). On the other hand, in Australia, "Financial literacy is about understanding money and finances and being able to confidently apply that knowledge to make effective decisions" (Australian Government, 2017). Despite the variations in different definitions, a general theme can be summarised as: "a combination of the understanding (knowledge), skills, attitude, and ability to make sound judgement and decision (behaviour) on personal financial matters resulting in individual financial well-being" (Australian Unity, 2014; Huston, 2010). The linkage and the importance of the examining FL and PIS could be explored from the following two perspectives. First, by this definition, FL can also be considered as a personal characteristic; social cognition; psychopathology; and specific motivation, suggested by the I-PACE model. Hence this provides a basis for the argument that FL could be one of the influencing factors in the process of developing as well as maintaining the PIS behaviour. Second, finding from empirical studies provided supportive evidence for a direct relationship between FL and general consumer behaviour, as such financial literate individuals were more likely to take control of their financial situation reflecting from their buying behaviour and expenditures (Ramsay & Capuano, 2011). This would result in minimising financial risk and the detrimental consequences (Ramsay & Capuano, 2011). However, this potentially important characteristic has never been examined previously in the field of PIS, nor in the area of CBD, as a factor of influence. Hence the aim of this exploratory epidemiological study is to bridge the knowledge gap to examine FL as potential risk factor associated with PIS. It is hypothesised that FL is significantly associated with PIS and can be considered as a potential risk factor.

2. Materials and methods

This cross-sectional online survey was conducted in February 2017. Participants of the survey were recruited through the online research company Prolific Academic, an Oxford University innovation startup company. Potential participants of the survey are registered members of Prolific Academic for survey participation. Current global registrations have exceeded 52,000 with members from many different countries around the world (https://www.prolific.ac/demographics). The baseline survey for respondent recruitment was conducted of the routine basis with the latest being in late 2016. Participants who satisfied the inclusion criteria of being in an age range between 18 and 60 years, and had shopped online at least once within the month prior to the survey, were invited to fill in the online questionnaire. A full completion of the questionnaire was awarded with a small payment. This approach of survey participant recruitment was shown to be as effective as other means (Crone & Williams, 2016; Mason & Suri, 2012). Ethics approval for the study was granted by the University of Technology Sydney Human Ethics Research Committee.

PIS was assessed using the Bergen Shopping Addiction Scale (BSAS) which was developed, based on the addiction criteria suggested in the DSM-5, to measure addictive shopping behaviour and effects (Andreassen et al., 2015). The BSAS consists of 7 items that reflect inner thoughts and states, as well as the behaviour of addictive shopping. An example question is: "I think about shopping/buying things all the time". Respondents were asked to indicate the propensity of their responses on a Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree). Total scores were calculated with possible scores ranging from a minimum of 0 to a maximum of 28. Study on the psychometric properties of BSAS indicated strong evidence of goodness-of-fit of a single factor model to the data with satisfactory test statistics for invariance between genders (Andreassen et al., 2015). In terms of internal consistency, it yielded a Cronbach's alpha value of 0.87, with item-total correlations ranging from 0.62 to 0.74. Strong and significant correlations between BSAS and personality, anxiety, depression and self-esteem provided evidence on the convergence with others measures in supporting construct validity (Andreassen et al., 2015). In the current study, to highlight the focus on Internet or online shopping, respondents were reminded that the words "shopping" or "buying" were in reference to "Internet shopping" or "Online buying". The authors recommended cut-off scores of 3 (agree) or 4 (strongly agree) in 4 of the 7 items to be considered as addictive. However, this requires confirmation with further studies (Andreassen et al., 2015).

The study variable FL was measured using the Financial Literacy subscale of the Financial Wellbeing Questionnaire (FWQ), which was designed and developed by Australian Unity (Australian Unity, 2014). Based on the aforementioned definition, the FL subscale was designed as part of the FWQ for assessing various aspects of FL, including: attitude towards spending, spending behaviour, debt management, and saving behaviour (Australian Unity, 2014). The FL subscale consists of 13 items with a response scale in a 5-point Likert format of agreement. Scoring ranges from 13 (minimum) to 65 (maximum). An example item was: "Before I buy something I carefully consider whether I can afford it". Another item was: "I make money so I can spend it right away". Results on Factor Analysis suggested a four-factor structure that was well-fitted with the conceptual construct. These factors included "Attitude towards spending" with 4 items; "Spending behaviour" with 3 items; "Debt management" with 4 items; and "Saving behaviour" with 2 items. The scale also demonstrated strong internal consistency with an overall Cronbach's alpha of 0.89 with item-total correlations ranging from 0.30 to 0.66 (Australian Unity, 2014).

Demographic information was also collected in the survey including age, sex, geographic region of birth, marital and employment status, the highest education level attained, and personal income, which was classified into 12 bands with increasing incomes from 1 to 12. The rating system was based on the general income brackets used in the UK

with an average of GBP10,000 as an increment interval. Respondents were asked to select the category of their current personal income from the list. Information on respondents' Internet shopping behaviour included frequency and money spent on shopping, shopping for luxury goods, and items purchased. As suggested in the literature, data on other possible risk factors of PIS were also collected. These included self-regulation using the Self-Regulation Questionnaire (SRQ) with the impulsivity and goal-setting subscales (Neal, Kate, & Carey, 1988), depression, anxiety, and stress with the Depression, Anxiety, and Stress Scale (DASS) (Antony, Bieling, Cox, Enns, & Swinson, 1988), as well as self-efficacy (Schwarzer & Jerusalem, 1995). Measuring instruments for these factors were well-validated and commonly used for research and clinical practices.

Data were analysed using the Stata V14.0 statistical software program (StataCorp, 2015). Bivariate analyses were conducted to examine unadjusted relationships between FL and PIS and all variables of interest. The associations between these variables and PIS were examined using correlations, independent Student's *t*-test, or Oneway Analysis of Variance (ANOVA) depending on the nature of the study variables. For the inclusion of potential risk factors in multivariate analyses, variables that attained a $p \leq 0.20$ in the bivariate analyses were selected to be included in further analysis. Multiple Linear Regression analyses, using a backward elimination approach, were employed to investigate the relationship between FL and PIS after adjusting for the effects of other potential confounding variables. A type one error rate of 5% was used for hypothesis testing.

3. Results

A total of 997 respondents were recruited, with all completing the questionnaire and providing useful data for analyses. The characteristics and outcome measures of the respondents were summarised in Table 1. In terms of PIS, the mean BSAS score of the sample was 8.2 (s.d. = 7.0) and, using the authors' yet-to-be-confirmed cut-off, 135 (13.8%) respondents could be classified as at high risk of addictive Internet shopping. For FL, the average score was 50.3 (s.d. = 8.2).

The bivariate relationship between PIS, respondents' demographics, other potential risk factors, and FL were examined. The results were summarised in Table 2. As shown, without adjustment to other variables, PIS was significantly associated with all variables. These included demographics, employment status, education level, personal income, shopping behaviour, and other potential risk factors such as self-regulation, depression, anxiety, and stress. FL was negatively but significantly correlated with PIS with a moderate correlation coefficient of -0.39 ($p < 0.001$). These variables were included in further analyses based on the pre-set selection rule of a significance level ≤ 0.20.

The results obtained from the multiple linear regression analyses were also presented in Table 3. A number of variables were retained in the final regression model which was highly significant and could explain nearly 66% of the total variance according to the adjusted R^2 value. (Table 3) These variables included some demographic factors, such as age, geographic region of birth, employment, and personal income. They also included shopping behaviour for example shopping frequency, purchase of luxury goods, and time spent on Internet shopping. Self-efficacy, self-regulation in terms of both impulsivity and goal setting, and anxiety were the potential psychosocial risk factors that remained significant in the final model. FL was still significantly and negatively associated with PIS with a regression coefficient of -0.13, after adjusting for the effects of other variables in the model ($t = -6.42$, $p < 0.001$). This result suggested that for every increase in the FL score by a unit, on average, there was a corresponding decrease in PIS by 0.13 units in this sample. An examination of the interaction terms between FL and the psychosocial variables indicated none were significant. This suggested that FL could be considered as an independent risk factor of PIS.

Table 1
Frequency (%) and means (s.d.) of Problematic Internet Shopping, demographics, Internet shopping behaviour, psychosocial factors, and financial literacy of survey respondents (N = 977).

Variables	(%) frequency or mean (s.d.)
Problematic Internet Shopping	15.2 (7.0)
Demographics	
Age	30.9 (8.8)
Sex[a]	
Male	60.7% (583)
Female	39.3% (377)
Geographic region of birth	
Northern Europe	31.3% (306)
Northern America	18.9% (185)
Southern Asia	14.4% (141)
Southern Europe	11.8% (115)
South/Eastern Asia	11.1% (108)
Others	12.5% (122)
Marital status	
Single/never married	37.7% (362)
Married/de facto	60.0% (576)
Devoiced/separated/widowed	2.3% (22)
Student status[a]	
Yes	34.8% (334)
No	65.2% (626)
Employment status[a]	
Employed full-time or part-time	80.1% (769)
Non-employed	19.9% (191)
Highest education level[a]	
Post graduate degree	3.0% (29)
Undergraduate or graduated	60.9% (585)
College and lower	36.1% (346)
Personal income rating (1–12)	3.3 (2.8)
Internet shopping behaviour	
Shopping frequency[a]	
Once in a few months	7.2% (69)
About once in a month	15.3% (147)
Few times in a month	25.9% (249)
About once in a week	22.1% (212)
Few times in a week	29.5% (283)
Shopping for luxury goods[a]	
Yes	49.2% (472)
No	50.8% (488)
Shopping duration per week (hours)	8.6 (4.2)
Spending on shopping/month (USD)	152.7 (347.2)
Top three most likely shopping items	
Fashion	22.0% (215)
Health care products	16.9% (165)
Cosmic/beauty products	15.3% (149)
Psychosocial factors	
Self-efficacy	30.8 (4.9)
Self-regulation impulsivity	30.4 (7.0)
Self-regulation goal setting	36.2 (5.1)
Depression	6.8 (6.1)
Anxiety	5.6 (5.5)
Stress	7.5 (5.5)
Financial literacy	50.3 (8.2)

[a] Not adding to the sample total due to missing; Possible scores for continuous variables: self-efficacy (10–14), regulation impulsivity (10–15), goal setting (1–55), depression, anxiety, stress (0–27), FL (13–65).

4. Discussion

This study aims to examine the association between financial literacy and Problematic Internet Shopping to determine whether FL, as a personal characteristic, could also be considered a potential risk factor of PIS. The results suggested that, after adjusting for the effects of demographic and potential psychosocial risk factors, FL was significantly and negatively related to PIS.

As aforementioned in the introduction, there has not been an equivalent study on the relationship between FL and PIS, and in fact also not in CBD. Due to the lack of similar studies on PIS, it could be

Table 2
Unadjusted associations between demographics, Internet shopping behaviour, psychosocial factors, financial literacy and Problematic Internet Shopping.

Variables	Results on association
Demographics	
Age	$r = -0.26$, $p < 0.001$
Sex	$t_{958} = -2.82$, $p = 0.005$
Geographic region of birth	$F_{(5, 971)} = 136.17$, $p < 0.001$
Marital status	$F_{(2, 957)} = 4.27$, $p = 0.014$
Student status	$t_{958} = -6.97$, $p < 0.001$
Employment status	$t_{958} = 6.10$, $p < 0.001$
Highest education level	$F_{(2, 957)} = 9.35$, $p < 0.001$
Personal income rating (1–12)	$r = 0.36$, $p < 0.001$
Internet shopping behaviour	
Shopping frequency	$F_{(4, 955)} = 22.61$, $p < 0.001$
Shopping for luxury goods	$t_{958} = 11.86$, $p < 0.001$
Shopping duration per week (hours)	$r = 0.25$, $p < 0.001$
Spending on shopping/month (USD)	$r = 0.15$, $p < 0.001$
Psychosocial factors	
Self-efficacy	$r = 0.16$, $p < 0.001$
Self-regulation impulsivity	$r = 0.58$, $p < 0.001$
Self-regulation goal setting	$r = 0.36$, $p < 0.001$
Depression	$r = 0.46$, $p < 0.001$
Anxiety	$r = 0.63$, $p < 0.001$
Stress	$r = 0.51$, $p < 0.001$
Financial literacy	$r = -0.39$, $p < 0.001$

Table 3
Results obtained from the final model of the regression analyses.

Variables retained in the final model	β	S.E.(β)	Test of significance
Financial literacy	−0.13	0.02	$t = -6.42$, $p < 0.001$
Age	−0.06	0.02	$t = -3.33$, $p = 0.001$
Geographic region of birth[a]			
South/Eastern Asia	3.82	0.62	$t = 6.15$, $p < 0.001$
Southern Europe	0.04	0.59	$t = 0.69$, $p = 0.490$
Southern Asia	4.95	0.61	$t = 8.08$, $p < 0.001$
Northern America	−1.12	0.53	$t = -2.19$, $p = 0.029$
Northern Europe	0.29	0.50	$t = 0.59$, $p = 0.558$
Not employed	−1.05	0.39	$t = -2.68$, $p = 0.007$
Income	0.16	0.06	$t = 2.68$, $p = 0.008$
Shopping frequency[b]			
About once in a month	−0.30	0.67	$t = -0.45$, $p = 0.656$
Few times in a month	1.05	0.63	$t = 1.68$, $p = 0.093$
About Once in a week	1.57	0.65	$t = 2.43$, $p = 0.015$
Few times in a week	2.30	0.64	$t = 3.58$, $p < 0.001$
Not buying luxury goods	−1.11	0.32	$t = -3.50$, $p < 0.001$
Time (hour)	0.04	0.02	$t = 2.23$, $p = 0.019$
Self-Efficacy	0.13	0.04	$t = 3.62$, $p < 0.001$
Self-regulation impulsivity	0.17	0.03	$t = 6.19$, $p < 0.001$
Self-regulation goal setting	0.08	0.04	$t = 2.20$, $p = 0.028$
Anxiety	0.29	0.04	$t = 7.83$, $p < 0.001$

Model significance: $F_{(19, 890)} = 89.76$, $p < 0.001$; Adjusted R-squared: 65.48%.
[a] Others as the referent group.
[b] Once in a few months as the referent group.

difficult to compare results obtained from the current study with others in the field. Should the cut-off recommended by the authors be used, 135 (13.8%) of the sample could be considered as at high risk of PIS. When compared to results obtained from studies on compulsive buying or excessive buying behaviour in the U.S. and Europe with a range between 6% and 8%, the estimated prevalence of PIS, based on the yet-to-be-confirmed cut-off, is slightly higher in this study (Koran, Faber, Aboujaoude, Large, & Serpe, 2006; Mueller et al., 2010; Neuner, Raab, & Reisch, 2005; Trotzke, Starcke, Muller, & Brand, 2015). However, in terms of the relationship between FL and PIS using a global sample, no studies have been found so far. The finding of the current study could be considered unique. A point worth noting is that, given the lack of attention and well-designed studies in this particular area, it would be prudent not to draw too much parallel between PIS and CBD

or to consider PIS as an extension of the general CBD without further in-depth studies. Over exposure to online advertisement and product placement in the media would possibly enhance the risk of PIS, as well as the ease of access for ordering online products could also lower the barrier in making a decision on buying. This could be a possible future direction for research within a well-constructed theoretical framework, such as the I-PACE model.

There is a direct implication of the results obtained from this study on prevention and clinical management of PIS. Based on the I-PACE model, as supported by the results of the study, FL could be considered a personal characteristic. However, unlike other personal factors, such as personality and psychopathologies that may be unchangeable or take a long time and a long process for improvement, FL is totally amendable. By definition, FL involves knowledge, skills, and behaviour in making sound judgement and decisions on personal financial matters. FL can be improved by enhancing the knowledge, skills, and attitudes in personal financial management through education and training programs under the guidance of a financial counsellor. As predicted by the Integrated Behaviour Model, behavioural change can be produced as a result of changes in knowledge, skills, and attitude (Fishbein, 2000). To prevent PIS, enhancing financial literacy in the population, particularly among young people, could have a positive effect. In terms of clinical treatment and management, apart from the proven therapeutic approach for treating Problematic Internet Use, such as Cognitive Behavioural Therapy for Internet Addiction (CBT-IA), (Young, 2011) additional intervention such as financial counselling should also be included as part of the treatment regime for PIS.

Some strengths and weaknesses are identified in this study. Respondents of the survey came from different geographical regions representing people of different linguistic and cultural backgrounds. The use of a standardised and validated measuring instrument for assessing the study and outcome variables, as well as other variables, minimised some measurement biases. Some limitations have also been identified. First, information on the study and outcome measures was collected via self-reporting. Hence this will constitute a report bias in both variables. Second, the sample was generated from a pool of individuals who received payment upon the completion of the survey. Hence, the chance of selection bias would be high and the results could not be generalized due to a non-representative sample. This study can be considered as an exploratory study to identify the potential risk factors for PIS. Future studies could be conducted with a random sample with a more comprehensive sampling technique.

References

American Psychiatry Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatry Association.

Andreassen, C. S., Griffiths, M. D., Pallesen, S., Bilder, R. M., Torsheim, T., & Aboujaoude, E. (2015). The Bergen shopping addiction scale: Reliability and validity of a brief screening test. *Frontiers in Psychology, 6*, 1374.

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1988). Psychometric properties of the 42-item and 21-item versions of the depression anxiety stress scales in clinical groups and a community sample. *Psychological Assessment, 10*, 176–181.

Australian Government (2017). National financial literacy strategy. http://www.financialliteracy.gov.au/, Accessed date: 3 February 2017.

Australian Unity (2014). *Financial wellbeing questionnaire—Design and validation.* Victoria, Melbourne: Australian Unity.

Black, D. W. (2007). A review of compulsive buying disorder. *World Psychiatry, 6*, 14–18.

Brand, M., Young, K. S., Laier, C., & Wölfling, K. (2016). Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neuroscience and Behavioral Reviews, 71*, 252–266.

Crone, D. L., & Williams, L. A. (2016). Crowdsourcing participants for psychological research in Australia: A test of microworkers. *Australian Journal of Psychology, 61*, 39–47.

Duroy, D., Gorse, P., & Lejoyeux, M. (2014). Characteristics of online compulsive buying in Parisian students. *Addictive Behaviors, 39*, 1427–1830.

Fishbein, M. (2000). The role of theory in HIV prevention. *AIDS Care, 12*, 273–278.

Huston, S. J. (2010). Measuring financial literacy. *Journal of Consumer Affairs, 44*, 296–316.

Karim, R., & Chaudhri, P. (2012). Behavioural addictions: And overview. *Journal of

Psychoactive Drugs, 44, 5–17.

Koran, L. M., Faber, R. J., Aboujaoude, E., Large, M. D., & Serpe, R. T. (2006). Estimated prevalence of compulsive buying behavior in the United States. *American Journal of Psychiatry, 163*, 1806–1812.

Leeman, R., & Potenza, M. (2013). A targeted review of the neurobiology and genetics of behavioural addictions: An emerging area of research. *Canadian Journal of Psychiatry, 58*, 260–273.

Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods, 44*, 1–23.

Mueller, A., Mitchell, J. E., Crosby, R. D., Gefeller, O., Faber, R. J., Martin, A., et al. (2010). Estimated prevalence of compulsive buying in Germany and its association with sociodemographic characteristics and depressive symptoms. *Psychiatry Research, 180*, 37–142.

Neal, D. J., Kate, B., & Carey, K. B. (1988). A follow-up psychometric analysis of the self-regulation questionnaire. *Psychology of Addictive Behaviors, 19*, 414–422.

Neuner, M., Raab, G., & Reisch, L. A. (2005). Compulsive buying in maturing consumer societies: An empirical re-inquiry. *Journal of Economic Psychology, 26*, 509–522.

OECD (2012). *OECD/INFE high-level principles on national strategies for financial education.* Paris: OECD.

Ramsay, I., & Capuano, A. (2011). *What causes suboptimal financial behaviour? An exploration of financial literacy, social influences and behavioural economics. University of Melbourne Legal Studies research paper no. 540.* Melbourne: University of Melbourne.

Rose, S., & Dhandayudham, A. (2014). Towards an understanding of Internet-based problem shopping behaviour: The concept of online shopping addiction and its proposed predictors. *Journal of Behavioral Addictions, 3*, 83–89.

Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. In J. Weinman, S. Wright, & M. Johnston (Eds.). *Causal and Control Beliefs*. Windsor, UK: NFER-NELSON.

StataCorp (2015). *Stata statistical software: Release 14.0.* College Station, TX: Stata Corporation.

Trotzke, P., Starcke, K., Muller, A., & Brand, M. (2015). Pathological buying online as a specific form of Internet addiction: A model-based experimental investigation. *PLoS One, 10*, e0140296.

United States Government Accountability Office (2012). *Financial literacy: The Federal Government's role in empowering Americans to make sound financial choices.* Washington, DC: US Government Accountability Office.

Young, K. S. (2011). CBT-IA: The first treatment model for internet addiction. *Journal of Cognitive Psychotherapy, 25*, 304–312.