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# **A Cross-Cultural and Cross-Gender Analysis of Compulsive Buying Behaviour's Core Dimensions**

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## **A Cross-Cultural and Cross-Gender Analysis of Compulsive Buying Behavior's Core Dimensions**

### **Abstract**

This study seeks to address the disagreement in the literature about compulsive buying behavior's (CBB) dimensional structure and tests for cross-cultural and cross-gender invariance in young British, Chinese, Czech and Spanish consumers using structural equation modelling. The results show that CBB has two compulsive dimensions: *Compulsive Purchasing* (CP), and *Self-control Impaired Spending* (SIS). These dimensions are cross-culturally invariant, although the influence of SIS on CBB is higher in more developed countries, particularly among females. The confirmation of the SIS dimension and the external validity of the CBB construct established through the cross-cultural invariance in CBB dimensions indicate that screening tools should be revised accordingly. The SIS dimension has possibly been previously misinterpreted as impulsive and/or as spontaneous buying and may explain the higher incidence of CBB among female consumers.

Keywords - compulsive buying, self-control impairment, spending, cross-cultural studies, gender

## **Introduction**

Compulsive buying behavior (CBB) is characterized by a compelling urge to buy something and an inability to resist the compulsion because of impaired self-control (Baumeister et al., 2008; Achziger et al., 2015). This compensates for a lack of inner satisfaction resulting from anxiety and low self-esteem (Valence et al., 1988; Faber & O'Guinn, 1989; Davenport et al., 2012), possibly caused by family problems during early years of life (Benmoyal-Bouzaglo & Moschis, 2009), and enables compulsive buyers to temporarily experience positive emotions in order to escape these negative feelings (Roberts et al., 2006; Horvath & von Birgelen, 2015). CBB has also been defined as a behavioral addiction (Aboujaoude, 2014; Andreassen, 2014) which can be co-morbid with other disorders e.g. excessive alcohol and drugs consumption (Kwak et al., 2004), and eating disorders (Trautmann-Attmann & Widner Johnson, 2009).

CBB has been found to be prevalent among young adults, particularly women (Neuner et al., 2005; Ridgway et al., 2008; Kilbourne & LaForge, 2010), however, previous studies have neglected the influence of culture. While prior research (d'Astous, 1990; Dittmar, 2005; Alemis and Yap, 2013) has shown that CBB has similar characteristics in different countries, these studies adopted different measurement scales and consequently, it is difficult to make a direct comparison of their results. The use of dissimilar instruments reflects the disagreement in the literature relating to the underpinning core dimensions of CBB. These are believed to be impulsion (Sherhorn et al., 1990), compulsion (Christenson et al., 1994) or a combination of both aspects (Ridgway et al., 2008; Davenport et al., 2012).

This study focusses on the influence of culture and gender on the dimensions of CBB in an attempt to address these key issues in this important area of consumer behavior research. Therefore, firstly, it re-examines the core dimensions of CBB in an effort to verify their uncertain identity, and secondly, it analyses the cultural and gender invariance of the dimensions across four countries: the UK, Spain, Czech Republic and China. The study, however, does not examine the age invariance of the dimensions because of sampling constraints. The validation of CBB's dimensional invariance has important implications for the diagnosis of the disorder and for international comparisons of CBB incidence.

### **CBB incidence, prevalence and economic development**

CBB studies have been carried out in many countries, for example, Canada (Valence et al., 1988; d'Astous, 1990; Yi, 2012) and the USA (Faber & O'Guinn, 1989; Trautmann-Attmann & Widner Johnson, 2009; Wang & Xiao, 2009; Joireman et al., 2010; Brougham et al., 2011; Reeves et al., 2012; Roberts & Roberts, 2012; Joung, 2013; Roberts et al., 2014). Research has also been undertaken in the UK (Elliott, 1994; Davenport et al., 2012), Australia (Alemis & Yap, 2013), Belgium (Mikolajczak-Degrauwe et al., 2012), France (Lejoyeux et al., 1997, Benmoyal-Bouzaglo & Moschis, 2009), South Korea (Park & Davis Burn, 2005; Sohn & Choi, 2012), Germany (Neuner et al., 2005), Israel (Shoham & Makovec Brencic, 2003), Malta (Clark & Calleja, 2008), Spain (Rodriguez-Villarino et al., 2006; Garcia, 2007), China (Li et al., 2009), the Netherlands (Horvath & von Birgelen, 2015) and Taiwan (Wang & Yang, 2008; Lo et al., 2012). However, to date, there are only a few cross-cultural comparative studies. Kwak et al. (2004) focused on the relationship between personality and advertising in relation to CBB in the USA and South Korea. More recently, Mueller et al. (2010) compared German

and American personality prototypes in relation to CBB, and Claes et al. (2011) examined German and Dutch compulsive buyers in regard to eating disorders and temperament among students. All of these comparative studies used Faber and O'Guinn's (1992) measurement scale.

CBB is been found to be more prevalent in developed countries with relatively buoyant economies, and with higher levels of both disposable income and leisure time (Dittmar, 2005; Black & Carver, 2007). In the USA, Faber and O'Guinn (1989) found that 6% of the population is affected by the disorder, whereas later studies by Roberts and Jones (2001) and Ridgway et al. (2008) reported a 9% and an 8.9% incidence, respectively. Kwak et al. (2004), focusing on a more specific demographic, found that 17% of the US population aged between 28 and 39 years was affected by CBB. The discrepancies in the proportion of compulsive buyers may reflect variation in the dimensionality (impulsivity or compulsivity) of the screening tools employed and/or demographic differences (particularly age and gender) and geographic (urban or rural) characteristics of the study samples. Therefore, it was of fundamental importance to identify the underpinning dimensions of the CBB construct before measuring its invariance across different countries.

Research has also shown that CBB has increased in transitional economies where consumers have been exposed to Western values and lifestyles due to political changes and new means of communication for example, West Germany, Mexico, Russia, China and countries in Eastern Europe and the former Soviet Union (Neuner et al, 2005). In East China, Li et al. (2009) found that power-prestige and quality positively influence compulsive buyer expenditure, particularly

in males, whereas societal attitudes towards retention (saving for the future) negatively influence compulsive buyers of both genders. According to Kacen and Lee (2002), individuals from collectivist cultures have traditionally been more concerned about the rules and practices imposed by their social environment and the opinions of others; therefore, collectivism might act as a deterrent to CBB. Li et al. (2009) also found that CBB in China was more prevalent among females, although the difference in CBB on the basis of gender was substantially less marked than that reported in other countries.

### **CBB dimensions**

There is no consensus in the literature about the underpinning dimensions of CBB, particularly in regard to its compulsive and impulsive aspects. Compulsions are *ego-dystonic* i.e. their manifestation is from within and their intrusive thoughts and obsessions are inconsistent with the individual's self-perception (McElroy et al., 1994). Compulsive consumers, therefore, realize that their experience is irrational, thereby causing stress and anxiety (Faber & O'Guinn, 1989; Aardema & O'Connor 2003/2007), which activates a cognitive mechanism to find a rapid solution to the negative feelings; this manifests itself with buying (Valence et al., 1988). By comparison, impulsions are *ego-syntonic* i.e. coherent with the individual's self-perception and spur from external stimuli rather than internal causes (McElroy et al., 1994). Sherhorn et al., (1990) and Shoham & Makovec Brencic (2003) have linked impulsiveness to CBB with particular reference to the consumer's decision making in relation to stimuli within the retail environment. Ridgway et al. (2008) recognize both impulsive and compulsive features of CBB, and Rodriguez-Villarino et al. (2006) argue that the degree of predominance of one dimension over another is related to different degrees of intensity of CBB, with impulsivity

influencing the less afflicted and compulsivity influencing the more afflicted. However, more recent studies (e.g. Davenport et al., 2012; Andreassen, 2014) argue that CBB should be studied from the perspective of addiction. Given the current disagreement over CBB dimensions, it was considered necessary to re-visit the dimensionality of CBB before examining both cross-cultural and gender variance in CBB.

## **Method**

### **Measures**

In order to re-examine the core dimensions of CBB it was important to identify widely recognized and previously validated CBB screening tools to establish a viable pool of items, which could explain the phenomenon; CBB dimensions could then be established through factor analysis. This study is based on Valence et al. (1988) and Faber and O'Guinn's (1989) seminal work on CBB because, although other subsequent screening scales were developed (e.g. Edwards, 1993; Christenson et al., 1994), they are insufficiently different from the original versions to warrant consideration; this is reflected in the continuing use of the original scales. Valence et al. (1988) identified four CBB dimensions derived from 16 items: tendency factors, reactive factors, family factors, and post purchase factors. Their screening tool was adopted in a number of later studies (e.g. d'Astous, 1990; Sherhorn et al., 1990; Dittmar, 2005; Neuner et al., 2005; Rodriguez-Villarino et al., 2006; Albrecht et al., 2007; Garcia, 2007; Clark & Calleja, 2008; Li et al., 2009). Faber and O'Guinn's (1989) screening scale encompassed three main aspects of CBB derived from 14 items: an obsessive-compulsive tendency, economic issues, and personal feelings. This tool and its later abridged version (Faber & O'Guinn, 1992) have also been adopted for use in subsequent studies (e.g. Christenson et al., 1994; Elliott, 1994;



Mowen & Spears, 1999; Shoham & Makovec Brencic, 2003; Kwak et al., 2004; Park & Davis Burn, 2005; Norum, 2008; Wang & Xiao, 2009; Claes et al., 2011; Mueller et al., 2011; Davenport et al., 2012; Reeves et al., 2012; Roberts et al., 2014; Horvath & von Birgelen, 2015).

Given the wide recognition of the validity of both Valence et al.'s (1988) and Faber and O'Guinn's (1989) scales and their widespread recent use in a range of international settings, the questionnaire used in this study included all items from both studies. Nevertheless, some modifications were necessary for different reasons. Firstly, the validity of the scales notwithstanding, in light of recent theoretical developments some of the original items relate to peripheral conditions associated with the disorder rather than its core traits, reflecting the more exploratory nature of the studies at that stage in the development of CBB research. Secondly, it was important to update the language to avoid respondent misinterpretation of the items. Modifications and some exclusion were made on the basis of an inter-coder reliability test, protocol analyses and pilot tests. The final questionnaire included 23 items, from the original 30, and was presented on five-point scales labelled from *Disagree strongly* (1) to *Agree strongly* (5). Details of the changes to Valence et al.'s (1988) and Faber and O'Guinn's (1989) original scales are presented in Tables 1 and 2, respectively.

***Table 1 about here***

***Table 2 about here***

We used exploratory factor analysis (EFA) and parallel analysis using a Monte Carlo simulation, both using SPSS Version 22, and a confirmatory factor analysis (CFA) using AMOS Version 22 to identify and verify the CBB dimensions shared across the four cultural groups within the sample. Structural equation modelling (with AMOS 22) was then used to test for multi-group invariance across the four cultural groups and for cross-gender invariance. Finally, a two-way analysis of variance (ANOVA) was used to further examine the gender differences across the cultural groups.

### **Sample**

A purposive sample of 776 respondents was obtained, consisting of sub-samples from the UK, Spain, the Czech Republic, and China. No previous study has examined CBB dimension invariance across four countries simultaneously. The countries were selected because of their differences in both culture and/or stage of politico-economic development. Theoretically, consumers in collectivist societies should be more able to refrain from compulsive buying because of their closer relationships with others in their community (Kacen and Lee, 2002). By contrast, in individualistic societies, unrestrained individual decision making might exacerbate the levels of CBB. Shoham and Makovec Brencic (2003) argue that the socio-economic environment has an important influence on consumer behavior. They therefore anticipated that the political change in East-Europe would lead to an increase in CBB in some of those countries, including the Czech Republic. In Eastern China, where the economic setting is also rapidly changing, Li et al. (2009) found that culture had a significant impact on the disorder, but argued that the factors influencing CBB in China might not apply in Western societies because the Chinese culture, embedded in Confucianism, shapes consumption in different ways

than Western countries. Therefore, it was important to obtain samples from both developed and developing economies in addition to including respondents from both collectivist and individualist countries.

China and the Czech Republic were selected because their economies are developing; the Czech Republic leans towards individualism, while China is highly collectivist (Hofstede, 2014). The two countries with a developed economy, the UK and Spain, were chosen among Western countries because Britain is highly individualist whilst Spain leans towards collectivism (ibid) (see Table 3). Within these countries, the challenge of obtaining respondents with the requisite demographic and economic characteristics of compulsive buyers was met by using a purposive sample of university students (Tables 4 and 5). CBB is more prevalent among young adults compared with older age groups (Neuner et al., 2005; Ridgway et al., 2008; Roberts & Roberts, 2012) and in lower income groups (Koran et al., 2006). Samples from the four countries were obtained by contacting universities in countries which represented the required cultural and economic characteristics, and acquiring permission to administer questionnaire surveys. Data were collected in eight university campuses (two in each country). In China data were obtained from Sun Yat Sen University in both Guangzhou and Zhuai campuses; in the Czech Republic, data were collected at the University of Prague and the University of Pilsen. In Britain data were collected from the University of Salford and Leeds Metropolitan University, while in Spain collection took place at the University Rais Juan Carlos in Madrid and the University of Seville. The choice of university students in CBB research is also in line with other recent studies (e.g. Mowen & Spears, 1999; Clark & Calleja, 2008; Manolis & Roberts, 2008; Ridgeway et al., 2008; Benmoyal-Bouzaglo & Moschis, 2009;

Trautmann-Attmann & Widner Johnson, 2009; Wang & Xiao, 2009; Brougham et al., 2011; Claes et al., 2011; Mueller et al., 2011).

*Table 3 about here*

*Table 4 about here*

*Table 5 about here*

Professional translators were employed to change the questionnaire from English to Czech, Spanish and Chinese; the meaning of the translated questionnaires was then checked *in loco* by bilingual academics who were native speakers. The survey method was chosen to facilitate the collection of a substantial amount of data in a relatively short period of time. Hard copies of the questionnaire were distributed, with each tutor's agreement, a few minutes before the end of a class to avoid disruption, and participation in the survey was entirely voluntary. Therefore, it was not always possible to obtain a balanced gender proportion among the respondents. A total of 1000 (4 x 250) questionnaires were distributed, 828 were completed (82.8%). Thirty-one questionnaires were excluded because the respondent nationality was different from the country where the survey took place and 21 questionnaires were excluded because they were incomplete; 776 useable questionnaires were obtained: 184 (Czech Republic); 180 (China); 205 (Spain); 207 (UK).

## **Analysis and Results**

The first step to identify the dimensions to be tested for cross-cultural and cross-gender invariance was an exploratory factor analysis (EFA). Maximum Likelihood (ML) extraction

was used to allow generalization of the sample and maximize the probability of accuracy (Field, 2013). Oblique Promax rotation was employed to allow for factors to be inter-correlated because CBB is a social science construct (Tabachnick & Fidell, 2012). A minimum factor loading value of 0.4 was established to maximize explained variance for the sample size (Hair et al., 2010).

The EFA produced two factors with minimum eigenvalues of 1 which explained 67% of the total variance (see Table 6). A parallel analysis using a Monte Carlo simulation (O'Connor, 2000) using 1,000 randomly generated data sets, also produced two factors (Table 7).

***Table 6 about here***

***Table 7 about here***

The items loading on the first factor, labelled *Compulsive Purchasing* (CP) ( $\alpha = .77$ ), indicate the *ego-dystonic* manifestation of CBB: both a strong urge to purchase and its function as a temporary stress-release explained in the literature (e.g. Valence et al., 1988). The items loading on the second factor, labelled *Self-control impaired Spending* (SIS) ( $\alpha = .73$ ), express a clear loss of self-control over the temptation to spend (Baumeister et al., 2008; Vohs & Faber, 2007). The two dimensional solution was validated with CFA. The model (Figure 1) presented a good fit (CMIN/DF = 2.73, RMR = .03, AGFI = .97, NFI = .98, TLI = .98, CFI = .99, RMSEA = .05). The convergent and discriminant validity test results for the two dimensions were as follows: for SIS the scores were CR = .75, AVE = .60, MSV = .24, ASV = .24; however, for CP the scores were CR = .79, AVE = .49, MSV = .24, ASV = .24. The item As

*soon as I enter a shopping center/area, I have an irresistible urge to go into a shop to buy something* had to be eliminated from the model to reach a satisfactory validity score for the construct (CR= .75; AVE= .50). A re-test for the factorial validity of the modified construct was undertaken and presented an improved fit for both first and second order models (CMIN/DF = 1.02, RMR = .02, AGFI = .99, NFI = .99, TLI = 1.0, CFI = 1.0, RMSEA = .01).

First, the baseline model fit was compared with that of the configural model (see Table 8), obtained simultaneously from the same sample in a multi-group approach, using separate datasets for each cultural group. This determined that the structural pattern of the model was similar, hence comparable, across the four cultural groups (Byrne, 2010).

***Figure 1 about here***

***Table 8 about here***

### **Test for cultural invariance in CBB dimensions**

To examine for differences in the model across the four cultural groups, five measurement models and a structural model were compared against the configural model to test for invariance in the factors, in the factor loadings and in the factor covariance. Table 6 presents the details of each measurement model (A, B, C, D, and E) and the outcome from each comparative test. In model A, all factor loadings in the four cultural groups were constrained equal. By comparison, in models B and C only the factor loadings for CP and SIS, respectively were constrained equal in the four groups. The first three models (A, B, and C) present non-significant  $\chi^2$  differences in relation to the configural model, indicating invariance between the

groups. This outcome was corroborated by the extremely small CFI differences (0.001 to 0.003) between the measurement and configural models (Cheung & Rensvold, 2002). Models D and E provide further evidence of invariance across the four cultural groups in relation to the items *F.leisu* and *V.push*, which were constrained as a group in model B (as the CP factor); this precluded an assessment of invariance between each of these items in combination with *V.stres*. Table 9 also shows the results from the test comparing the structural model S (with all the factor loadings and covariance constrained equal across the four groups), with the configural model. This shows a significant difference ( $p < .001$ ) in factor covariance. Given that the two factors and the factor loadings were statistically invariant, this indicates that what differs across the groups is limited to the relationship between CP and SIS.

To identify the specific cultural groups between which the differences were occurring. Six hypothesized structural models were created and each possible combination of pairs, among the four cultural groups, was examined; each hypothesized model was compared with its equivalent model in which constraints of the factor loadings and factor covariance were applied (S1 v Sa, S2 v Sb, S3 v Sc, S4 v Sd, S5 v Se, and S6 v Sf - see Table 10). The results show significance differences in covariance between the British and each of the other cultural groups, particularly between the British and Chinese groups ( $\Delta CFI .08$ ). There were also significant differences in covariance between the Spanish and both the Czech and Chinese groups. The covariance between the Czech and the Chinese groups was invariant.

***Table 9 about here***

***Table 10 about here***

Further tests were then carried out in order to understand the influence of each factor on the covariance differences between the pairs of models. However, before undertaking the analyses, the Czech and Chinese cultural groups were merged because of their structural invariance (Byrne, 2010). The tests (see Table 11) compared three hypothesized models (S1, S7, and S8) with two equivalent constrained models. Both of these models had factor loadings, covariance and, in turn, one of the factors constrained equal, such that CP was constrained in models SEa, SEc, and SEe, and SIS was constrained in models SEb, SEd, and SEf.

There were significant differences between the British and Spanish groups in the influence of both CP and SIS (S1 v SEa and SEb). The differences between the British and Czech/Chinese group were also significant for both CP and SIS (S7 v SEc and SEd). The  $\Delta$ CFI statistics are much larger for the Czech/Chinese group in both factors (CP = .09; SIS = .10), indicating that the differences between the British and Czech/Chinese cultural groups were greater than those between the British and Spanish groups. The comparison between the Spanish and the Czech/Chinese groups also showed significant variance for CP (S8 v SEe). However, there was a non-significant difference (invariance) for SIS (S8 v SEf), although the  $\Delta$ CFI statistic (.04) suggests a small variance between the two groups (Cheung & Rensvold, 2002; Byrne, 2010). Overall, therefore, it was concluded that the CBB construct is invariant across the different cultural groups in terms of both factors and factor loadings. While this provides a measure of external validity for the two dimensions, both CP and SIS have significantly different influences on CBB across the cultural groups with the exception of the Czech and Chinese groups.



*Table 11 about here*

### **Test for gender invariance across the cultural groups**

Previous studies have identified a clear pattern of CBB prevalence among women (e.g. d'Astous, 1990; Neuner et al., 2005; Ridgway et al., 2008). However, this difference refers to the percentage of males and females exhibiting CBB, rather than verifying whether the CBB dimensions varied on the basis of gender. The four cultural groups were merged together and the data divided by gender in order to obtain a gender-based configural model (see Table 12) which demonstrated a good fit, indicating that the patterns were comparable (Byrne, 2010) with the baseline model. The tests for invariance were then carried out (see Table 13).

*Table 12 about here*

*Table 13 about here*

The difference between the configural model and the model with factor variance, factor loadings and covariance constrained equal (G1 v Ga) was significant, although the  $\Delta$ CFI statistic (.009), could indicate invariance. Moreover, the comparison of the configural model with its equivalent, with only the factor loadings constrained (G1 v Gb), shows that they were not significantly different; this indicates that the factor loadings are invariant across female and male subgroups. The configural model was also compared with the structural model (G1 v GS), with factor loadings and covariance constrained equal, and the difference was also non-significant, indicating invariance. Furthermore, the two factors were separately tested for invariance on the basis of gender; all factor loadings and first CP (G1 v Gc) and then SIS (G1 v

Gd) were constrained equal across male and female groups. The results show non-significant differences, hence invariance for CP, but significant differences (non-invariance) for SIS.

In order to further examine the relationship between SIS, culture, and gender, a two-way ANOVA was undertaken, using a random sample of female participants from each cultural group, to provide more equal gender subgroups (except for the Chinese sample - see Table 5). There was a significant interaction effect between gender and culture ( $F = 2.93; p < .03$ ) and significant main effects for gender ( $F = 7.42; p = .007$ ), albeit with a small effect size ( $\eta_p^2 = .02$ ), and culture ( $F = 33.76; p < .0001$ ), with a large effect size ( $\eta_p^2 = .16$ ). The post-hoc analysis, using a Tukey HSD procedure, showed significant differences between the British and Czech ( $p < .0001$ ), British and Spanish ( $p < .0001$ ) and British and Chinese ( $p < .0001$ ) cultural groups, but no differences between any other groups. Figure 2 shows that British females and males have the highest marginal means and the largest gender differential compared with the other cultural groups. The Spanish subgroup also shows a differential between females and males, albeit much smaller, while Czech and especially Chinese compulsive buyers are much less distinguishable on the basis of gender. The latter supports the gender balance found in China by Li et al. (2009). It is also interesting to note that while British males score lower than British females, they score higher than females and males in all other cultural groups.

***Figure 2 about here***

## **Discussion**

### **The dimensions of CBB**

The CFA produced two distinct but related dimensions: compulsive buying (CP) and self-control impaired spending (SIS), but no impulsive dimension was found in contrast to previous studies (Dittmar, 2005; Rodriguez-Villarino et al., 2006; Ridgway et al., 2008). The identification of this new SIS dimension represents a key theoretical contribution. Hitherto, spending has been considered to be, in part, an impulsive response to external stimuli (e.g. Ridgway et al., 2008) rather than caused by an inability to exercise self-control (Baumeister, et al., 2008; Taguey et al., 2004) compounded by the compulsion to act (purchase) to relieve anxiety (Valence et al., 1988). The CP-SIS configuration of CBB also reflects more closely its designation as an addiction (Aboujaoude, 2014; Andreassen, 2014).

### **Cultural invariance in CBB dimensions**

Both CP and SIS dimensions and their respective factor loadings were found to be invariant across the different cultural groups. This is also an important finding because it not only provides a measure of external validity for the CBB construct, but shows that the core antecedents of the phenomenon remain rooted in the psychological dynamics of compulsive consumers, regardless of their specific cultural context. By comparison, there were significant differences in the relationship between the CP and SIS dimensions across the groups. These differences occurred between the British and the other cultural groups (and were particularly marked between the British and Czech groups), and to a lesser extent between the Spanish and both the Czech and the Chinese groups. However, the results showed that the CP-SIS relationship was invariant between the Czech and Chinese groups. According to Hofstede

(2014), these two countries score similarly low in their attitude towards indulgence, which may influence compulsive buyers without changing the universal parameters of the problem. The relatively low attitude towards indulgence scores for Spain are also reflected in the less marked albeit significant differences between the Spanish and both the Czech and Chinese groups compared with the English group. It is therefore possible that culture might mitigate the self-perception of compulsive consumers and the extent to which they both perceive their spending to be problematic and indulge in finding relief from their anxiety, without influencing their core compulsive behavior.

Overall, the results also indicate that CBB is not influenced by cultural orientation towards individualism or collectivism. Kacen and Lee (2002) presumed that collectivism, such as that which characterizes Chinese society, would function as a deterrent to CBB, however, the invariance in the CBB construct found in this study does not support this view. This is not surprising given that the influence of collectivism on CBB is consistent with the theory that the disorder relates to *ego-syntonic* impulsivity, whereby an individual's cognitive functions are influenced by a degree of rationality as opposed to internal causes associated with *ego-dystonic* compulsivity. Moreover, it is interesting to note that the CBB construct is invariant across Chinese and English groups, which are positioned at the antipodes of Hofstede's (2014) spectrum for long term orientation. Chinese culture is embedded in Confucianism, which advocates the importance of long term vision and social amelioration, while the British strive for quick and progressive social change (*ibid*). For Chinese consumers, this social aspect would theoretically be expected to represent another deterrent to spending compulsively because saving for the future is part of their social fabric. The confirmation that the core CBB

dimensions are invariant across the different cultural settings, therefore, makes an important theoretical contribution. Compulsive buyers seem to act in the same way regardless of their cultural background and social value systems. This indicates that CBB lies in the universality of the inner human psyche and, as such, external influences have only a superficial impact on the disorder.

### **Cross-cultural variance in SIS by gender**

The results further contribute to the consumer behavior literature by showing that there are no differences across the cultural groups on the CP dimension, but differences were identified in relation to SIS. British consumers are distinctive in terms of their high male and female marginal means for SIS and large SIS gender differential compared with other cultural groups. The Spanish subgroup also shows a small SIS differential on the basis of gender compared with the Czech Republic and especially China. This indicates that the influence of SIS on CBB is higher in more developed, short-term oriented countries and that its influence on females is more marked in these countries. The differential impact could be due to the dissimilar cultural perceptions of indulgence in the social settings and women's different roles in society, which facilitate or restrict their freedom of expression through spending and buying behavior. The SIS dimension of CBB and more specifically, the higher loss of control over spending among females in more developed countries, could therefore explain the higher incidence of CBB among female consumers reported in previous research (e.g. Faber & O'Guinn, 1992; Shoham & Makovec Brencic, 2003; Neuner et al., 2005; Ridgway et al., 2008) and which has hitherto been unexplained.

## **Conclusion and Limitations**

The study makes an important contribution to the literature in three key areas of CBB research. Firstly, the CFA verified *Compulsive Purchasing* (CP) and *Self-control Impaired Spending* (SIS) as the core dimensions of the disorder. Secondly, the multi-group analysis, using SEM, showed that the CBB dimensions are invariant across the four cultural groups with respect to the confirmed factors and factor loadings notwithstanding the variation in the relationship between CP and SIS. Thirdly, there were no cross-cultural differences in CBB dimensions between male and female consumers with the exception of SIS, which varied between British consumers and all other cultural groups on the basis of gender.

The findings also have important practical implications for the international standardization of CBB screening and detection. The confirmation of the SIS dimension and the external validity of the CBB construct established through the cross-cultural invariance in CBB dimensions indicate that screening tools should be revised accordingly. This would facilitate both an early identification of the disorder among young persons and a direct international comparison of CBB incidence, which has hitherto been problematic because of the disagreement over CBB dimensions and the different measurement instruments being used. It also offers an opportunity for policy makers to regulate retailers' activities which may influence the escalation of CBB in both developed and developing countries, although further research is needed on the extent to which external factors influence CBB before more detailed recommendations can be made.

While the study makes an important contribution to the literature on CBB and provides a new foundation for further study of the disorder, particularly in a cross-cultural context, its

limitations should be noted. First, a purposive non-probability sample of university students was taken in each of the four countries. The sample characteristics reflect the age, gender and income characteristics of compulsive consumers, and are comparable with previous CBB studies with similar sampling constraints, notwithstanding the limited socio-economic data. However, the differences between students and other young people in the same age group within each population are unknown; further research could therefore attempt to obtain a larger, more diverse sample of young consumers in each cultural sub-group and a more balanced gender division among participants. Secondly, while the questionnaire design included the two dominant screening tools by Valence et al. (1988) and Faber and O'Guinn (1989), further qualitative research could identify additional screening items for testing in order to extend the current understanding of the CBB phenomenon. Nevertheless, all CBB domains, including the typical impulsive items, were adequately represented by the survey instrument adopted for the study. Other cultural groups could also be sampled to establish the wider relevance of the findings from this study. Further research should focus on the SIS dimension of the disorder, which seems to explain CBB's gender imbalance. While CBB is particularly prevalent among young consumers, future research should examine a wider range of age groups, which could potentially provide further insight into the development of the disorder.

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**Table 1. Modifications to Valence et al.’s (1988:426) original scale**

| Original items   | Explanation for inclusion and modifications   | Modification  | Included/Excluded |    |
|--|---|---|-------------------|----|
| <i>When I have money, I cannot help but spend part or the whole of it</i>  | Potential deviant behavior  |   | <i>Included</i>   | 1  |
| <i>I am often impulsive in my buying behavior</i>  | Self-perception on buying attitude  |   | <i>Included</i>   | 2  |
| <i>As soon as I enter in a shopping center, I have an irresistible urge to go into a shop to buy something</i>   | Potential deviant behavior - The word ‘area’ was added to center (center/area) in order to reflect the variety of places where consumers may buy.                               | <i>As soon as I enter a shopping center/area, I have an irresistible urge to shop and buy something</i>     | <i>Included</i>   | 3  |
| <i>I am one of those people who often respond to direct mail offers (e.g., books, records)</i>   | General applicability and unclear underpinning of compulsive buying   |   | <i>Excluded</i>   | -- |
| <i>I have often bought a product that I did not need , while knowing that I have very little money left</i>  | Potential deviant behavior  |   | <i>Included</i>   | 4  |
| <i>I am a spendthrift</i>  | Potential deviant behavior - the word ‘spendthrift’ is no longer in common use and was updated  | <i>I am a reckless spender</i>  | <i>Included</i>   | 5  |
| <i>For me shopping is a way of facing the stress of my daily life and of relaxing</i>  | A belief that shopping can release tension, typical need of compulsive buyers   |   | <i>Included</i>   | 6  |
| <i>I sometimes feel that something inside pushed me to go shopping</i>   | Potential compulsive deviant behavior   |   | <i>Included</i>   | 7  |
| <i>There are times when I have a strong urge to buy (clothing, books, etc.)</i>  | Potential compulsive deviant behavior. The two items have very similar meanings, therefore, they were merged in one   | <i>I have a strong urge to buy something</i>  | <i>Included</i>   | 8  |
| <i>I often have an unexplainable urge, a sudden and spontaneous desire, to go and buy something in a store</i>   |   |   |                   |    |
| <i>During my adolescence, I had enough money to buy myself, from time to time, some things that I enjoyed</i>  | General applicability, however, possible relationship with compulsive buying development - For clarity, two verbs and the first part of the sentence were updated               | <i>As a teenager, I have/had enough money to buy myself, from time to time, some things that I enjoy/ed</i> | <i>Included</i>   | 9  |
| <i>During my entire teenage years, I was told what I should do with my money</i>   | General applicability, however, possible relationship with compulsive buying development - For clarity, a verb and the first part of the sentence were updated                  | <i>As a teenager, I am/was told what I should do with my money</i>  | <i>Included</i>   | 10 |
| <i>In the event that I had some financial problems, I know that I could rely on somebody to help me out</i>  | It refers to a rational assessment of a financial situation but not specifically and/or directly related to CBB   |   | <i>Excluded</i>   | -- |
| <i>At times, I have felt somewhat guilty after buying a product, because it seemed unreasonable</i>  | It indicates an occasional feeling and/or a possible attitude of non-compulsive consumers; however, guilt appears to be a recurrent issue for CBB - The verb tense was modified | <i>At times, I have felt somewhat guilty after buying a product, because it seemed unreasonable</i>         | <i>Included</i>   | 11 |
| <i>There are some things I buy that I do not show to anybody for fear of being perceived as irrational in my buying behavior (“a foolish expense”)</i> | It indicates an occasional feeling and/or a possible attitude of non-compulsive consumers; however, hiding purchasing appears to be a recurrent issue for CBB                   |   | <i>Included</i>   | 12 |
| <i>I have sometimes thought “If I had to do it over again, I would...” and felt sorry for something I have done or said.”</i>                          | Unclear meaning   |   | <i>Excluded</i>   | -- |

**Table 2. Modifications to Faber & O’Guinn’s (1989:741) original scale**

| Original items  | Explanation for inclusion and modifications  | Modification  | Included/Excluded |    |
|---|--|---|-------------------|----|
| <i>Bought something in order to make myself feel better</i>                         | Potential trigger of compulsive buying behavior - The verbs tense was changed  | <i>I buy something in order to make myself feel better</i>  | <b>Included</b>   | 1  |
| <i>Felt anxious or nervous on days I didn't go shopping</i>                         | Potential precursor of deviant behavior, implying repression of a compulsion to release tension - The verbs tense was changed                      | <i>I feel anxious or nervous on days I don't go shopping</i>  | <b>Included</b>   | 2  |
| <i>Felt depressed after shopping</i>  | Although a consequence of CBB rather than an explanation of it, it seems a recurrent aspect in the literature - The verbs tense was changed        | <i>I feel depressed after shopping</i>  | <b>Included</b>   | 3  |
| <i>Bought something and when I got home I wasn't sure why I had bought it</i>       | It can also refer to a possible attitude of non-compulsive consumers – however, it may indicate an attitude to buy without a reason                | <i>I buy something and when I get home I am not sure why I have bought it</i>                       | <b>Included</b>   | 4  |
| <i>Went on a buying binge and I wasn't able to stop</i>                             | Potential deviant behavior - The verbs tense was changed   | <i>I go on a buying binge and I am not able to stop</i>   | <b>Included</b>   | 5  |
| <i>Bought things even though I couldn't afford them</i>                             | Potential deviant behavior - The verbs tense was changed   | <i>I buy things even though I can't afford them</i>   | <b>Included</b>   | 6  |
| <i>If I have any money left at the end of the pay period, just have to spend it</i> | Potential deviant behavior – The beginning of the sentence and the verb was modified for clarity   | <i>If any money is left at the end of the pay period, I just have to spend it</i>                   | <b>Included</b>   | 7  |
| <i>Made only the minimum payments on my credit cards</i>                            | It refers to credit card use rather than buying behavior   |   | <b>Excluded</b>   | -- |
| <i>Wrote a check when I knew I didn't have enough money in the bank to cover it</i> | it appears to be vague; therefore the reason for writing a cheque was specified - The verbs tense was changed                                      | <i>I write a cheque(s)/buy things when I know I don't have enough money in the bank to cover it</i> | <b>Included</b>   | 8  |
| <i>Felt others would be horrified if they knew of my spending habits</i>            | It refers to presumed opinion of others rather than explaining CBB   |   | <b>Excluded</b>   | -- |
| <i>Just wanted to buy things and didn't care what I bought</i>                      | Potential deviant behavior - The verbs tense was changed   | <i>I just want to buy things and don't care what I buy</i>  | <b>Included</b>   | 9  |
| <i>I often buy things simply because they are on sale</i>                           | General applicability that may imply a rational motivation, however it could be potentially a deviant behavior since it concerns unnecessary items |   | <b>Included</b>   | 10 |
| <i>Shopping is fun</i>  | indicator of an attitude toward shopping though it appears vague and presented the risk of misinterpretation and it was modified                   | <i>I consider shopping to be a leisure activity</i>   | <b>Included</b>   | 11 |
| <i>I really believe that having more money would solve most of my problems</i>      | General applicability and vague statement indicating desire to have more money rather than explaining CBB  |   | <b>Excluded</b>   | -- |



**Table 3. Cultural Characteristics of British, Czech, Spanish and Chinese**

| <b>Countries</b>      | <b>Culture\Model description</b> |                                   |                    |                    |                                 |                   |
|-----------------------|----------------------------------|-----------------------------------|--------------------|--------------------|---------------------------------|-------------------|
|                       | <b>Power</b>                     | <b>Individualism<br/>Distance</b> | <b>Masculinity</b> | <b>Uncertainty</b> | <b>Pragmatism<br/>Avoidance</b> | <b>Indulgence</b> |
| <b>Britain</b>        | 35                               | 89                                | 66                 | 35                 | 51                              | 69                |
| <b>Czech Republic</b> | 57                               | 58                                | 57                 | 74                 | 70                              | 29                |
| <b>Spain</b>          | 57                               | 51                                | 42                 | 86                 | 48                              | 44                |
| <b>China</b>          | 80                               | 20                                | 66                 | 30                 | 87                              | 24                |

Source: Hofstede (2014)

**Table 4. Sub-Samples by Age**

| <b>Countries</b>      | <b>Age groups and percentage</b> |          |              |          |              |          |              |          |              |          |                |                 |
|-----------------------|----------------------------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|----------------|-----------------|
|                       | <b>18-24</b>                     | <b>%</b> | <b>25-34</b> | <b>%</b> | <b>35-44</b> | <b>%</b> | <b>45-54</b> | <b>%</b> | <b>55-64</b> | <b>%</b> | <b>Missing</b> | <b>Total No</b> |
| <b>Britain</b>        | 145                              | 70.1     | 36           | 17.4     | 21           | 10.1     | 5            | 2.4      | --           | 0        | --             | 207             |
| <b>Czech Republic</b> | 177                              | 96.2     | 5            | 2.7      | --           | 0        | --           | 0        | 1            | 0.5      | 1              | 184             |
| <b>Spain</b>          | 164                              | 80.0     | 34           | 16.6     | 4            | 2.0      | 1            | 0.5      | --           | 0        | 2              | 205             |
| <b>China</b>          | 174                              | 96.7     | 6            | 3.3      | --           | 0        | --           | 0        | --           | 0        | --             | 180             |
| <b>Totals</b>         | 660                              |          | 81           |          | 25           |          | 6            |          | 1            |          | 3              | 776             |

**Table 5. Sub-Sample Cultural Groups by Gender**

| <b>Countries</b>      | <b>Female</b>    |          | <b>Male</b>      |          | <b>Total</b> |
|-----------------------|------------------|----------|------------------|----------|--------------|
|                       | <b>Frequency</b> | <b>%</b> | <b>Frequency</b> | <b>%</b> |              |
| <b>Britain</b>        | 142              | 68.6     | 65               | 31.4     | 207          |
| <b>Czech Republic</b> | 132              | 74.7     | 52               | 28.3     | 184          |
| <b>Spain</b>          | 147              | 71.7     | 58               | 28.3     | 205          |
| <b>China</b>          | 89               | 49.5     | 91               | 50.5     | 180          |
| <b>Totals</b>         | 510              | 65.7     | 266              | 34.3     | 776          |

**Table 6. CBB Dimensions from the Exploratory Factor Analysis**

| Compulsive Buying Dimensions  | Factors      |              |             |
|---|--------------|--------------|-------------|
|   | 1            | 2            | Communality |
| <b>Factor 1: Compulsive Purchasing</b>  |              |              |             |
| For me, shopping is a way of facing the stress of my daily life and relaxing                              | <b>.806</b>  | -.026        | .632        |
| I sometimes feel that something inside pushes me to go shopping   | <b>.732</b>  | -.023        | .523        |
| As soon as I enter a shopping center/area, I have an irresistible urge to go into a shop to buy something | <b>.611</b>  | .094         | .430        |
| I consider shopping to be a leisure activity  | <b>.567</b>  | -.003        | .320        |
| <b>Factor 2: Self-control Impaired Spending</b>   |              |              |             |
| If I have any money left at the end of the pay period, I just have to spend it                            | -.018        | <b>.924</b>  | .840        |
| I often buy things even though I can't afford them  | .034         | <b>.616</b>  | .398        |
| <b>Eigenvalue</b>   | <b>2.77</b>  | <b>1.22</b>  |             |
| <b>Variance (%)</b>   | <b>46.18</b> | <b>20.30</b> |             |
| <b>Cumulative Variance (%)</b>  | <b>46.18</b> | <b>66.48</b> |             |
| <b>Cronbach's Alpha</b>   | <b>.77</b>   | <b>.73</b>   |             |
| <b>Number of Items: 6</b>   | <b>4</b>     | <b>2</b>     |             |

Notes: Factors with eigenvalues greater than or equal to 1.0 were retained because the sample size exceeds 250 (n = 776); average communality = 0.53; the minimum coefficient for factor items to be included in the final scales was 0.5. KMO measure of sampling adequacy: 0.75; Bartlett's test of Sphericity:  $\chi^2 = 1223.03$ ;  $p < .001$ . Correlation between factors 1 and 2:  $r = .42$ .

**Table 7. Results from Monte Carlo Parallel Analysis**

| Factors | Raw Data | Eigenvalues<br>Mean* | 90 <sup>th</sup> Percentile |
|---------|----------|----------------------|-----------------------------|
| 1.      | 5.88     | .39                  | .45                         |
| 2.      | 1.18     | .33                  | .37                         |
| 3.      | .99      | .28                  | .32                         |

\*Mean eigenvalues from 1000 random data sets (50th percentile)

**Table 8. Comparison of Baseline and Configural Models Using Multi-Group Analysis**

| <b>Model description</b>                            | <b>CMIN/DF</b> | <b>RMR</b> | <b>AGFI</b> | <b>NFI</b> | <b>TLI</b> | <b>CFI</b> | <b>RMSEA</b> |
|---|----------------|------------|-------------|------------|------------|------------|--------------|
| <b>Baseline: all groups undifferentiated (CFA)</b>  | 1.03           | .02        | .99         | 1.00       | 1.00       | 1.00       | .01          |
| <b>Configural model: with differentiated groups</b> | 1.83           | .03        | .95         | .97        | .96        | .98        | .03          |

**Table 9. Multi-Group Invariance Test Results**

| Model Description   | Groups      | Comparative Model | $\chi^2$ | <i>df</i> | $\Delta\chi^2$ | $\Delta df$ | <i>p</i>        | CFI | $\Delta CFI$ |
|---|-------------|-------------------|----------|-----------|----------------|-------------|-----------------|-----|--------------|
| <b>Configural Model 1:</b>  | Br-Sp-Cz-Ch | -                 | 29.34    | 16        | -              | -           | -               | .98 | -            |
| <b>Measurement Model A:<br/>all factor loadings constrained equal</b>               | Br-Sp-Cz-Ch | A v 1             | 40.89    | 25        | 11.55          | 9           | <i>p</i> < .24  | .98 | .003         |
| <b>Measurement Model B:<br/>only CP factor loadings constrained equal</b>           | Br-Sp-Cz-Ch | B v 1             | 36.08    | 22        | 6.74           | 6           | <i>p</i> < .35  | .98 | .001         |
| <b>Measurement Model C:<br/>only SIS factor loadings constrained equal</b>          | Br-Sp-Cz-Ch | C v 1             | 34.78    | 19        | 5.43           | 3           | <i>p</i> < .14  | .98 | .003         |
| <b>Measurement Model D:<br/>only F.leisu constrained equal</b>                      | Br-Sp-Cz-Ch | D v 1             | 30.46    | 19        | 1.11           | 3           | <i>p</i> < .77  | .99 | .002         |
| <b>Measurement Model E:<br/>only V.push constrained equal</b>                       | Br-Sp-Cz-Ch | E v 1             | 31.70    | 19        | 2.36           | 3           | <i>p</i> < .50  | .99 | .001         |
| <b>Structural Model: S<br/>all factor loadings and covariance constrained equal</b> | Br-Sp-Cz-Ch | S v 1             | 99.66    | 28        | 70.32          | 12          | <i>p</i> < .001 | .91 | .071         |

Notes: Br: British; Sp: Spanish; Cz: Czech; Ch: Chinese; CP: Compulsive Purchasing; SIS: Self-control Impaired Spending; F.leisu: I consider shopping to be a leisure activity; V.push: I sometimes feel that something inside pushes me to go shopping.

**Table 10. Structural Model Multi-Group Invariance Test Results**

| Model Description                                | Groups | Comparative Model | $\chi^2$ | <i>df</i> | $\Delta\chi^2$ | $\Delta df$ | Statistical Significance | CFI | $\Delta CFI$ |
|--|--------|-------------------|----------|-----------|----------------|-------------|--------------------------|-----|--------------|
| <b>Hypothesized Model S1</b>                     | Br-Sp  |                   | 17.01    | 8         | -              | -           | -                        | .99 | -            |
| <b>Model Sa: all FL and CO constrained equal</b> | Br-Sp  | S1 v Sa           | 36.61    | 12        | 19.59          | 4           | $p < .0001$              | .96 | .025         |
| <b>Hypothesized Model S2</b>                     | Br-Cz  |                   | 11.15    | 8         | -              | -           | -                        | .99 | -            |
| <b>Model Sb: all FL and CO constrained equal</b> | Br-Cz  | S2 v Sb           | 64.69    | 12        | 53.53          | 4           | $p < .0001$              | .98 | .012         |
| <b>Hypothesized Model S3</b>                     | Br-Ch  |                   | 16.53    | 8         | -              | -           | -                        | .99 | -            |
| <b>Model Sc: all FL and CO constrained equal</b> | Br-Ch  | S3 v Sc           | 66.21    | 12        | 49.68          | 4           | $p < .0001$              | .91 | .080         |
| <b>Hypothesized Model S4</b>                     | Sp-Cz  |                   | 12.81    | 8         | -              | -           | -                        | .98 | -            |
| <b>Model Sd: all FL and CO constrained equal</b> | Sp-Cz  | S4 v Sd           | 25.87    | 12        | 13.06          | 4           | $p < .01$                | .94 | .036         |
| <b>Hypothesized Model S5</b>                     | Sp-Ch  |                   | 18.19    | 8         | -              | -           | -                        | .97 | -            |
| <b>Model Se: all FL and CO constrained equal</b> | Sp-Ch  | S5 v Se           | 27.41    | 12        | 9.22           | 4           | $p < .05$                | .95 | .016         |
| <b>Hypothesized Model S6</b>                     | Cz-Ch  |                   | 12.33    | 8         | -              | -           | -                        | .98 | -            |
| <b>Model Sf: all FL and CO constrained equal</b> | Cz-Ch  | S6 v Sf           | 15.13    | 12        | 2.80           | 4           | $p < .592$               | .98 | .006         |

Notes: Br: British; Sp: Spanish; Cz: Czech; Ch: Chinese; FL: Factor loadings; CO: Covariance.



**Table 11. Factorial Influence on Covariance: Multi-Group Invariance Test Results**

| Model Description                                      | Groups | Comparative Model | $\chi^2$ | <i>df</i> | $\Delta\chi^2$ | $\Delta df$ | Statistical Significance | CFI | $\Delta CFI$ |
|--|--------|-------------------|----------|-----------|----------------|-------------|--------------------------|-----|--------------|
| <b>Hypothesized Model 1</b>                            | Br-Sp  |                   | 17.01    | 8         | -              | -           | -                        | .99 | -            |
| <b>Model SEa: all FL, CO and CP constrained equal</b>  | Br-Sp  | S1 v SEa          | 38.94    | 13        | 21.93          | 5           | $p < .001$               | .96 | .028         |
| <b>Model SEb: all FL, CO and SIS constrained equal</b> | Br-Sp  | S1 v SEb          | 58.27    | 13        | 36.34          | 5           | $p < .0001$              | .93 | .031         |
| <b>Hypothesized Model S7</b>                           | Br-C/C |                   | 12.35    | 8         | -              | -           | -                        | .99 | -            |
| <b>Model SEc: all FL, CO and CP constrained equal</b>  | Br-C/C | S7 v SEc          | 78.33    | 13        | 65.98          | 5           | $p < .0001$              | .90 | .094         |
| <b>Model SEd: all FL, CO and SIS constrained equal</b> | Br-C/C | S7 v SEd          | 131.11   | 13        | 36.34          | 5           | $p < .0001$              | .80 | .101         |
| <b>Hypothesized Model S8</b>                           | Sp-C/C |                   | 14.01    | 8         | -              | -           | -                        | .99 | -            |
| <b>Model SEe: all FL, CO and CP constrained equal</b>  | Sp-C/C | S8 v SEe          | 29.20    | 13        | 15.19          | 5           | $p < .010$               | .96 | .025         |
| <b>Model SEf: all FL, CO and SIS constrained equal</b> | Sp-C/C | S8 v SEf          | 21.21    | 13        | 7.20           | 5           | $p < .206$               | .95 | .039         |

Notes: Br: British; Sp: Spanish; C/C: Czech and Chinese; FL: Factor loadings; CO: Covariance; CP: Compulsive Purchasing; SIS: Self-control Impaired Spending.

**Table 12. Gender Analysis Results**

| <b>Model description</b>                                      | <b>CMIN/DF</b> | <b>RMR</b> | <b>AGFI</b> | <b>NFI</b> | <b>TLI</b> | <b>CFI</b> | <b>RMSEA</b> |
|---|----------------|------------|-------------|------------|------------|------------|--------------|
| <b>Baseline: all groups, undifferentiated (CFA)</b>           | 1.03           | .02        | .99         | 1.00       | 1.00       | 1.00       | .01          |
| <b>Configural model: all groups, differentiated by gender</b> | 1.88           | .03        | .97         | .98        | .98        | .99        | .03          |

**Table 13. Gender Invariance Test Results**

| <b>Model Description</b>                         | <b>Groups</b> | <b>Comparative Model</b> | $\chi^2$ | <i>df</i> | $\Delta\chi^2$ | $\Delta df$ | <b>Statistical Significance</b> | <b>CFI</b> | <b><math>\Delta CFI</math></b> |
|--|---------------|--------------------------|----------|-----------|----------------|-------------|---------------------------------|------------|--------------------------------|
| <b>Configural Model G1: All Groups</b>           | F - M         | ----                     | 15.06    | 8         | -              | -           | -                               | .99        | -                              |
| <b>Model Ga: FL, CO and VA constrained equal</b> | F - M         | G1 v Ga                  | 28.64    | 14        | 13.58          | 6           | $p < .035$                      | .98        | .009                           |
| <b>Model Gb: FL constrained equal</b>            | F - M         | G1 v Gb                  | 16.95    | 11        | 1.88           | 3           | $p < .597$                      | .99        | .002                           |
| <b>Model GS: FL and CO constrained equal</b>     | F - M         | G1 v GS                  | 17.11    | 12        | 2.05           | 4           | $p < .730$                      | .99        | .003                           |
| <b>Model Gc: FL and CP constrained equal</b>     | F - M         | G1 v Gc                  | 17.11    | 12        | 2.05           | 4           | $p < .726$                      | .99        | .003                           |
| <b>Model Gd: FL and SIS</b>                      | F - M         | G1 v Gd                  | 27.67    | 12        | 12.61          | 4           | $p < .014$                      | .98        | .010                           |

Notes: FL: Factor loadings; CO: Covariance; VA: Variance; CP: Compulsive Purchasing; SIS: Self-control Impaired Spending.

Figure 1: CBB Dimensions Model

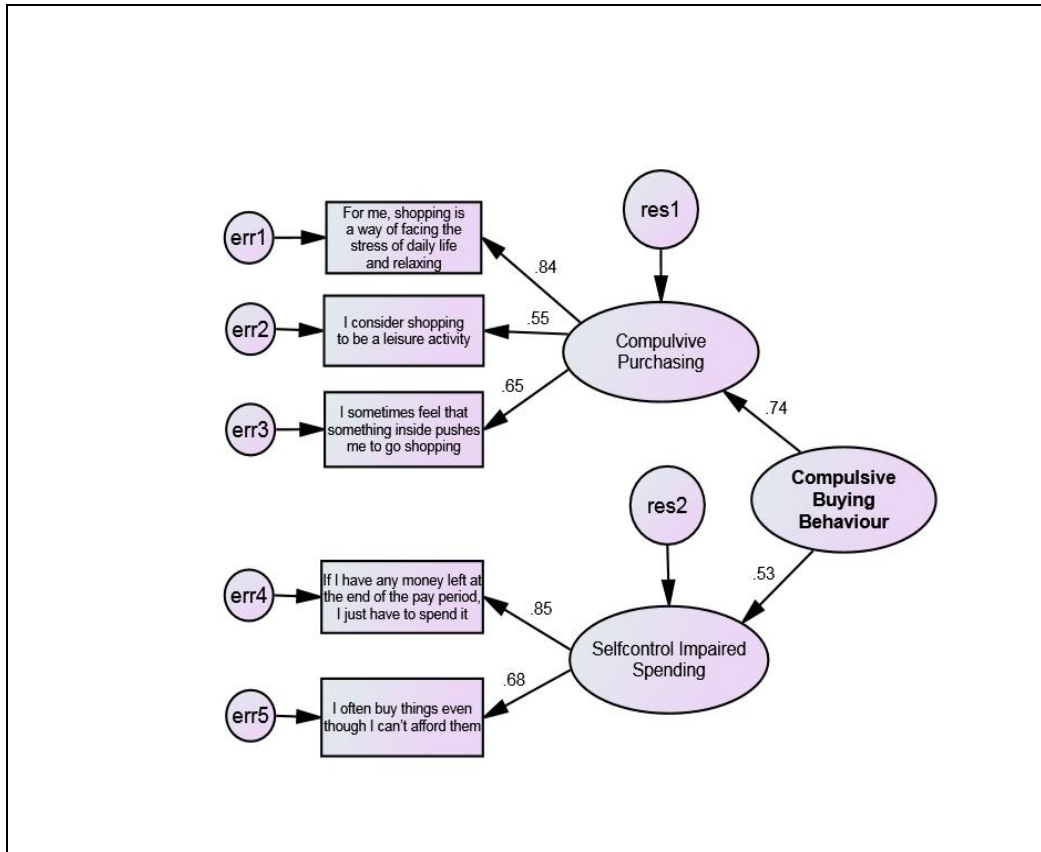


Figure 2: Estimated Marginal Means for Self-control Impaired Spending

