

# Gender Differences in Pathways to Compulsive Buying in Chinese College Students in Hong Kong and Macau

TERENCE H. W. CHING<sup>1\*</sup>, CATHERINE S. TANG<sup>1</sup>, ANISE WU<sup>2</sup> and ELSIE YAN<sup>3</sup>

<sup>1</sup>Department of Psychology, Faculty of Arts & Social Sciences, National University of Singapore, Singapore, Singapore

<sup>2</sup>Department of Psychology, Faculty of Social Sciences, University of Macau, Macau, China

<sup>3</sup>Department of Social Work & Social Administration, University of Hong Kong, Hong Kong

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**Background and aims:** The addictive nature of compulsive buying implies that mood disturbances, stress, and cognitive biases that underlie compulsive buying might operate in ways similar in both genders. In the current study, we aimed to test hypothetical pathways of mood compensation and irrational cognitions, which may explain compulsive buying tendencies. We also examined potential gender differences in these pathways. **Methods:** Two-hundred and thirty-two male (age:  $M = 20.30$ ,  $SD = 1.74$ ) and 373 female Chinese college students (age:  $M = 19.97$ ,  $SD = 1.74$ ) in Hong Kong and Macau completed measures assessing compulsive buying, psychological distress, avoidance coping, materialism, and buying-related cognitions. Mediation analyses via a structural equation modeling approach explained by Cheung (2007, 2009) were conducted, with gender as a grouping variable. **Results:** There was a gender difference in the mood compensation pathway; avoidance coping partially mediated the link between psychological distress and compulsive buying severity in females only. On the other hand, the irrational cognitive pathway, in which irrational buying-related cognitions fully mediated the link between materialism and compulsive buying severity, was supported for both genders. There was no gender difference in the extent of mediation within the irrational cognitive pathway, and the mediation effect within the irrational cognitive pathway was larger than that within the mood compensation pathway for both genders. **Conclusions:** Mood compensation processes in compulsive buying might be female specific, and secondary to irrational cognitions, which were gender invariant. Gender-dependent mechanisms and irrational cognitions should be emphasized in compulsive buying treatment.

**Keywords:** compulsive buying, shopping addiction, mood compensation, irrational cognitions, mediation, gender differences

## INTRODUCTION

Compulsive buying (or “shopping addiction” as mentioned in the DSM-5; American Psychiatric Association, 2013) can be defined, at the extreme end of the continuum, as excessive, chronic, and poorly controlled purchasing, despite adverse consequences (Black, 2007; McElroy, Keck, Pope, Smith, & Strakowski, 1994; Müller, Mitchell, & de Zwaan, 2015). It can be viewed as a progression from recreational to addictive buying that is egosyntonic but functionally impairing (Hollander & Allen, 2006; Sohn & Choi, 2014).

The majority of research on mechanisms of compulsive buying was conducted in Western societies (Dittmar, 2007), despite shopping also being a major leisure activity in urbanized, consumption-oriented Chinese cities (Wong & Ahuvia, 1998). To address this gap, we studied psychological processes underlying compulsive buying in a large sample of Chinese college students in Hong Kong and Macau.

Previous research suggested that a mood compensation process operates in compulsive buying (DeSarbo & Edwards, 1996; Karim & Chaudhri, 2012). For example, elevated psychological distress has been observed in compulsive buying (Boujbel & d’Astous, 2015; Harvanko et al., 2013; Müller et al., 2015; Voth et al., 2014; Williams, 2012b), with strong associations between these constructs

(Brook, Zhang, Brook, & Leukefeld, 2015; Lejoyeux, Hourtane, & Ades, 1995; Moschis, 2007; Müller et al., 2014). Psychological distress also fluctuates in congruence with the initiation and termination of compulsive buying episodes (Jung & Yi, 2014; Miltenberger et al., 2003; Mueller et al., 2012). Furthermore, compulsive buyers tend to attach emotional concepts to consumption-related items (e.g., see Kyrios, McQueen, & Moulding, 2013). In this perspective, compulsive buying is viewed as an avoidance coping strategy (Horváth, Büttner, Belei, & Adıgüzel, 2015; Lazarus & Folkman, 1984; Otero-López & Villardefrancos, 2014) that provides only temporary relief from negative affectivity and stress (Rodríguez-Villarino, González-Lorenzo, Fernández-González, Lameiras-Fernández, & Foltz, 2006; Williams, 2012a). The transient stress-relieving and mood-repairing effects are, however, strongly reinforcing, prompting increasingly addictive compulsive buying whenever emotional distress arises (Dittmar, Long, & Bond, 2007; Grant, Potenza, Weinstein, & Gorelick, 2010; Potenza, 2009). As such, we hypothesized that psychological

\* Corresponding author: Terence H. W. Ching; Department of Psychology, Faculty of Arts & Social Sciences, National University of Singapore, Block AS4, #02-07, 9 Arts Link, Singapore 117570, Singapore; Phone: +65 9635 4482; E-mail: [thwching@gmail.com](mailto:thwching@gmail.com)

distress and avoidance coping tendencies would be associated with compulsive buying, with avoidance coping mediating the impact of psychological distress on compulsive buying severity (see Figure 1).

Irrational cognitive factors have also been implicated in compulsive buying. Among these, materialism has been postulated as capable of initiating compulsive buying (Donnelly, Ksendzova, & Howell, 2013; Hamish & Bridges, 2015; Mueller et al., 2011). Materialism is characterized by beliefs in possession-defined success and acquisition as the pursuit of happiness (Richins & Dawson, 1992) and is strongly associated with compulsive buying (Claes et al., 2010; Dittmar, 2005a; Frost, Kyrios, McCarthy, & Matthews, 2007; Yurchisin & Johnson, 2004), particularly among young consumers (Dittmar, 2005b; Xu, 2008). Likewise, we hypothesized that materialism will be related to compulsive buying severity here. Because compulsive buying is viewed as a behavioral addiction (Lawrence, Ciorciari, & Kyrios, 2014b), with close links to pathological gambling (Black et al., 2015; Black, Monahan, Schlosser, & Repertinger, 2001), it might also operate according to irrational expectancies and control-oriented beliefs like in pathological gambling (Raylu & Oei, 2002; Toneatto, 1999; Toneatto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997). Adapting the Gambling Related Cognitions Scale (GRCS; Raylu & Oei, 2004) that has been validated in Chinese populations, we sought to explore whether compulsive buying will also be related to the following irrational buying-related cognitions: (a) the illusory belief that one can control and enhance buying outcomes via personal knowledge and skills (e.g., believing that good luck in other areas of life means that one is more likely to purchase quality items at heavy discounts); (b) the erroneous belief in one's ability to predict successful buying outcomes based on irrelevant cues and subjective probabilities (e.g., good weather as a sign that one can make "value-for-money" purchases); (c) misinterpretations of missed buying opportunities as signals for continued buying (e.g., "missing out on a good buy" interpreted as the greater likelihood of later purchasing the same item at a better price); (d) the perceived inability to stop buying (which functions as a self-fulfilling prophecy that perpetuates problematic buying); and (e) expectations about the psychological benefits of buying (e.g., excitement, relaxation). These irrational cognitions have been previously investigated in similar but less diverse forms (Kyrios, Frost, & Steketee, 2004; McQueen,

Moulding, & Kyrios, 2014; for neurophysiological evidence, see Lawrence, Ciorciari, & Kyrios, 2014a). Validating their relevance to compulsive buying will therefore broaden the cognitive picture of the condition. In this proposed irrational cognitive pathway to compulsive buying, we also expected irrational buying-related cognitions to mediate the influence of materialism on compulsive buying, thereby charting how compulsive buying as motivated by materialism might persist via such irrational cognitions (see Figure 1).

Lastly, extant research has demonstrated gender differences in compulsive buying (Achtziger, Hubert, Kenning, Raab, & Reisch, 2015; Brook et al., 2015; d'Astous, 1990; Faber, Christenson, de Zwaan, & Mitchell, 1995; Koran, Bullock, Hartston, Elliott, & D'Andrea, 2002), as well as psychological symptoms, coping styles, and cognitive biases. Recent studies have also noted that the underlying factors of compulsive buying differ between males and females (e.g., see Mueller et al., 2011). We thus explored whether there would be gender differences in our proposed pathways to compulsive buying.

## METHODS

### Participants and procedure

Advertisements for Chinese college students to participate in our study were distributed throughout university campuses in Hong Kong and Macau. Six hundred and five Chinese students (232 males and 373 females) from different faculties within the universities completed measures of constructs of interest for course credit. Participants' age ranged from 17 to 32 years old ( $M = 20.10$ ,  $SD = 1.74$ ). Males ( $M = 20.30$ ,  $SD = 1.74$ ) were older than females ( $M = 19.97$ ,  $SD = 1.74$ ),  $t(603) = 2.23$ ,  $p < .05$ .

### Measures

**Edwards Compulsive Buying Scale.** The Edwards Compulsive Buying Scale (ECBS; Edwards, 1993) is a reliable and valid 13-item measure of inclination toward, preoccupation with, feelings experienced during and after, and dysfunction surrounding buying. Importantly, the continua nature of the ECBS fits with the nature of the present study. Statements are endorsed or rejected on a four-point scale from 1 (never) to 4 (always). Higher scores (after appropriate reverse-scoring) indicate greater severity on the compulsive buying continuum. Although the psychometric properties of the ECBS have not been examined in Chinese or other Asian samples, previous research has recommended the ECBS for investigating compulsive buying in college students (Manolis, Roberts, & Kashyap, 2008; Tommasi & Busonera, 2012). For example, Manolis and Roberts (2008) noted several advantages to using the ECBS over the clinical screener for compulsive buying developed by Faber and O'Guinn (1992). Specifically, compulsive buying was strongly implicated as a mediator in the relationship between the antecedent of materialism and the outcome of credit card misuse only when measured by the ECBS, similar to the general directionality of our proposed

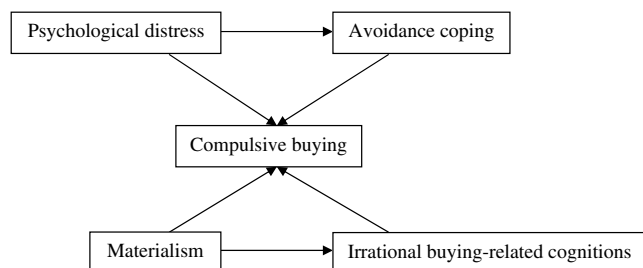


Figure 1. The upper half of the figure illustrates the mood compensation pathway to compulsive buying behavior; the lower half illustrates the irrational cognitive pathway

irrational cognitive pathway. Additionally, due to the restrictive criteria listed in the screener, Manolis and Roberts (2008) recommended the use of the ECBS instead in examining the compulsive buying phenomenon among the general consumer population, inclusive of unscreened college students, as we have recruited here. Indeed, the ECBS demonstrated good reliability in our sample, Cronbach's  $\alpha = .86$ . Furthermore, ECBS scores of the total sample were moderately to strongly correlated with scores on measures of other constructs purported to be related to compulsive buying in the present study ( $r_s = .24$  to  $.52$ ,  $p_s < .001$ ), indicative of good convergent validity.

*Depression Anxiety Stress Scales, 21-item version.* The Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995) is a measure of the core symptoms of depression, anxiety, and stress spanning the past week. The continua nature of the DASS-21 also makes it suitable as a measure of mood disturbances and stress for this study. Each subscale consists of seven items rated on a four-point scale from 0 (non-applicability) to 3 (extremely high applicability). Higher scores represent greater psychological distress. Numerous psychometric evaluations of the DASS-21 have revealed satisfactory to high internal consistency and test-retest reliability, as well as satisfactory convergent and discriminant validity in various clinical and college or community samples of diverse ages, ethnicities, and nationalities (e.g., see Antony, Bieling, Cox, Enns, & Swinson, 1998; Gloster et al., 2008; Gong, Xie, Xu, & Luo, 2010; Norton, 2007). Likewise, the DASS-21 demonstrated excellent reliability in the present sample, Cronbach's  $\alpha = .94$ .

*Avoidance Coping Scale-Modified.* The Avoidance Coping Scale-Modified (ACS-M; Cheng & Tang, 1995) is a nine-item measure of avoidance coping strategies (e.g., crying, running away from pressing issues, bottling up one's emotions) rated on a four-point scale from 1 (never) to 4 (frequently). Higher scores indicate stronger avoidance coping tendencies. In our sample, the item "pretending nothing had happened" was dropped in order to maximize internal consistency. A Cronbach's  $\alpha$  of  $.68$  was thus obtained. Nonetheless, the relatively low reliability of the ACS-M, compared with the other measures used in this study, was more than compensated for by its brevity, efficiency of administration, and comprehensive coverage of different forms of avoidant coping strategies commonly employed by Asian individuals (see Sheu & Sedlacek, 2004).

*Material Values Scale.* The Material Values Scale (MVS; Richins, 2004; Richins & Dawson, 1992) is a reliable, valid, and established 18-item measure of core materialistic beliefs. Statements are endorsed or rejected on a four-point scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores (after appropriate reverse-scoring) indicate stronger materialistic beliefs. The original development and validation studies of the MVS have revealed adequate to good reliability and validity (Richins, 2004; Richins & Dawson, 1992). In our sample, the item "My life would be better if I owned certain things that I do not have" was excluded so that the resulting 17-item MVS would yield satisfactory internal consistency, Cronbach's  $\alpha = .73$ .

*Buying-Related Cognitions Scale.* The Buying-Related Cognitions Scale (BRCS) was adapted from the reliable and valid 23-item GRCS (Raylu & Oei, 2004; Oei, Lin, & Raylu, 2007), which has been tested and validated in Chinese populations. In the BRCS, gambling references are substituted with buying-related ones. This scale measures irrational buying-related cognitions, such as illusion of control over buying, predictive control over buying, buying-related interpretative biases, the perceived inability to stop buying, and buying-related expectancies. Statements are endorsed or rejected on a seven-point scale from 1 (strongly disagree) to 7 (strongly agree). Higher scores represent more irrational, control-oriented, buying-related cognitions. In our sample, the Cronbach's  $\alpha$  was  $.92$ .

### Statistical analyses

Descriptive statistics for all measures were first obtained, followed by gender-based comparisons. Bivariate correlations among variables were then tested for the total sample and for each gender. Subsequently, mediation analyses via a structural equation modeling approach employing bootstrapped confidence intervals (2000 repetitions; Cheung, 2007, 2009) were carried out on both hypothesized pathways to compulsive buying, with gender as a grouping variable. The statistical significance of the bootstrapped indirect effect within each pathway was the testable indicator of a mediation effect (i.e., significant when the confidence interval [CI] does not contain zero). A priori intra- and intergender comparisons of these indirect effects (i.e., in each gender, contrasting indirect effects between pathways; for each pathway, contrasting indirect effects between genders) were also conducted alongside mediation analyses. Similarly, in these tests (2000 repetitions; Cheung, 2007, 2009), there is a significant difference between indirect effects when the bootstrapped CI does not contain zero. This approach to mediation analyses allows for high-powered, statistically robust tests of the specific-mediated pathways to compulsive buying (i.e., benefit of the SEM approach), and the simultaneous and parsimonious determination of gender differences in these pathways (without having to insert gender as a moderator of these pathways). All analyses were conducted in the R environment.

### Ethics

The study procedures were carried out in accordance with the Declaration of Helsinki. The Institutional Review Boards of the National University of Singapore, the University of Hong Kong, and the University of Macau approved the study. All participants were informed about the study and all provided informed consent.

## RESULTS

Shapiro-Wilk tests for normality of each variable in the total sample and for each gender indicated normality of data in each analysis,  $p_s > .05$ . Table 1 displays descriptive

statistics for all measures for the total sample and by gender. For the entire sample, compulsive buying severity did not exhibit a significant relationship with monthly income [ $M = \$7,314$  (HKD),  $SD = \$34,648$  (HKD)],  $r = .02$ ,  $p > .05$ . Females, on average, had higher compulsive buying scores,  $t(603) = 2.64$ ,  $p < .01$ . Additionally, females reported higher avoidance coping tendencies [ $t(603) = 7.46$ ,  $p < .001$ ], while males reported greater psychological distress [ $t(603) = 2.38$ ,  $p < .05$ ]. There were no gender differences in materialism and irrational buying-related cognitions,  $ps > .05$ .

Table 1 also displays bivariate correlations among measures for the total sample and by gender. For the total sample and each gender, correlations were in the expected directions, with compulsive buying severity exhibiting moderate to strong associations with psychological distress, avoidance coping tendencies, materialism, and irrational buying-related cognitions.

Mediation analyses converged to an admissible solution after 62 iterations,  $\chi^2(6) = 111.97$ ,  $p < .001$ . Because  $\chi^2$  is sensitive to a large sample size, other fit indices (comparative fit index [CFI], root mean squared error approximation [RMSEA], and standardized root mean square residual [SRMR]) were calculated. A CFI value of .95 or higher, RMSEA value of .08 or lower, and a SRMR value of .08 or lower are indicative of good model fit (Hu & Bentler, 1999). Values for these three fit indices (CFI = .96, RMSEA = .06, and SRMR = .05) indicated good model fit. Results are summarized in Figure 2. Among females, the mood compensation pathway accounted for 18.3% of the variance in compulsive buying severity, with avoidance coping partially

mediating the association between psychological distress and compulsive buying severity. Specifically, although the indirect effect of distress through avoidance coping was significant (.03, 95% CI = [.02, .06]), the direct effect of distress on compulsive buying remained significant even after controlling for avoidance coping (.09, 95% CI = [.04, .15]). The irrational cognitive pathway accounted for 23.1% of the variance in compulsive buying severity. Results indicated that irrational buying-related cognitions fully mediated the link between materialism and compulsive buying severity. In other words, the indirect effect of materialism through irrational cognitions was significant (.18, 95% CI = [.12, .23]), and the direct effect of materialism on compulsive buying was not significant after controlling for irrational cognitions (.09, 95% CI = [-.02, .20]).

Among males, the mood compensation and irrational cognitive pathways, respectively, accounted for 24.6% and 36.7% of the variance in compulsive buying severity. Results indicated that avoidance coping did not mediate the link between psychological distress and compulsive buying severity. In other words, the indirect effect was non-significant (.01, 95% CI = [-.02, .04]), while distress had a significant direct effect on compulsive buying (.18, 95% CI = [.09, .25]). Similar to females, irrational buying-related cognitions were found to fully mediate the link between materialism and compulsive buying. The indirect effect of materialism through irrational cognitions was significant (.16, 95% CI = [.08, .25]), but the direct effect of materialism on compulsive buying was not significant after controlling for irrational cognitions (-.01, 95% CI = [-.13, .11]).

In sum, the above results demonstrate that the irrational cognitive pathway is valid for both genders, while the mood compensation pathway is specific to females only (i.e., gender difference in the mood compensation pathway). Additionally, there was no significant gender difference in the extent of mediation within the irrational cognitive pathway (.02, 95% CI = [-.10, .12]). Furthermore, in both genders, the mediation effect within the irrational cognitive pathway was significantly larger than that within the mood

Table 1. Descriptive statistics and correlations for all measures

	<i>M</i>	<i>SD</i>	ACS-M	MVS	BRCS	ECBS
<b>DASS-21</b>						
Total	15.58	10.71	.31***	.11**	.34***	.39***
Males	16.89	11.46	.42***	.05	.49***	.49***
Females	14.77	10.15	.30***	.16**	.23***	.33***
<b>ACS-M</b>						
Total	19.89	3.70		.22***	.17***	.34***
Males	18.53	3.74		.12	.18**	.28***
Females	20.73	3.41		.29***	.18**	.36***
<b>MVS</b>						
Total	41.43	5.20			.31***	.24***
Males	41.00	5.32			.26***	.16*
Females	41.70	5.11			.36***	.30***
<b>BRCS</b>						
Total	73.92	19.85				.52***
Males	73.86	21.56				.61***
Females	73.96	18.73				.46***
<b>ECBS</b>						
Total	24.42	6.40				
Males	23.55	7.22				
Females	24.96	5.77				

Note. DASS-21 = Depression Anxiety Stress Scales, 21-item version; ACS-M = Avoidance Coping Scale-Modified; MVS = Material Values Scale; BRCS = Buying-Related Cognitions Scale; ECBS = Edwards Compulsive Buying Scale.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$  (two-tailed).

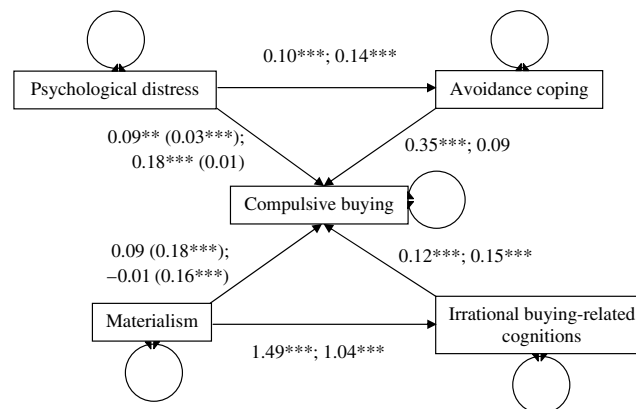


Figure 2. Standardized coefficients are displayed. Coefficients before each semicolon are values for females, while coefficients after each semicolon are values for males. Indirect effects are in parentheses. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  (two-tailed)

compensation pathway (for males: .14, 95% CI = [.06, .25]; for females: .14, 95% CI = [.08, .20]).

## DISCUSSION

Compulsive buying is prevalent in areas in which the consumer culture predominates (Black, 2001). Psychological variables believed to operate in compulsive buying in Western research were conceptualized into two separate pathways and validated here with a Chinese college sample. There was thus partial support for the robustness of conventionally researched mechanisms underlying excessive buying across different consumer cultures. However, our findings indicate that there are gender differences in the mechanisms of compulsive buying behavior in our sample.

Specifically, results at first showed that compulsive buying was moderately related to the variables of psychological distress and avoidance coping tendencies that make up the mood compensation pathway for both genders, seemingly demonstrative of a mood compensation process that might operate in precipitating and/or perpetuating such behavior across genders. This cohered with strong comorbidity of compulsive buying with certain mood (e.g., major depressive disorder) and anxiety disorders (e.g., generalized anxiety disorder; Harvanko et al., 2013; Mueller et al., 2009). This also coincided with DeSarbo and Edwards' (1996) typology of internal compulsive buyers (i.e., those who buy in response to salient emotional issues). However, our findings from subsequent mediation analyses clarified that this pathway was specific to females only. A possible explanation was that even though males in the present sample reported greater psychological distress, Chinese males might still exhibit a preference to engage in other more gender-stereotypical avoidance coping activities like pathological gambling or substance use (Cheung, 2014; Shek, Ma, & Tang, 2012), compared with buying. On the other hand, buying in order to avoid having to deal directly with stress and mood disturbances (Horváth et al., 2015; Otero-López & Villardefrancos, 2014) might be more applicable to females, given social perceptions of "retail therapy" as a largely female activity. Nonetheless, more research is needed to understand the gender discrepancy in this pathway.

The present study also aimed to uncover irrational cognitive contributors to compulsive buying. Previous research had typically focused on materialistic beliefs about status empowerment with exorbitant and repeated buying (e.g., see Dittmar, 2005a; Donnelly et al., 2013; Harnish & Bridges, 2015) or dysfunctional cognitions about the necessity of purchasing for emotional security (e.g., see Kyrios et al., 2004; McQueen et al., 2014). We therefore expanded the cognitive picture of compulsive buying by demonstrating the impact of irrational, control-oriented cognitions related to buying. The relevant results were insightful. Materialistic drives, as well as irrational, control-oriented, buying-related cognitions showed significant associations with compulsive buying across genders. The hypothesized irrational cognitive pathway was also supported for both males and females. Furthermore, the irrational cognitive pathway took precedence over the mood compensation pathway (i.e., significantly larger mediation effect) across genders.

The antecedental role of materialism in this pathway was supported by findings in past research with college students (e.g., see Mowen & Spears, 1999). The wide endorsement of materialistic beliefs in Chinese consumer culture apparently extended to Chinese college students, regardless of gender, and might occur intensely enough to drive the development of compulsive buying. This was also congruent with Dittmar's (2004) theory of materialistic buying as a form of identity construction in order to cope with low self-esteem. Additionally, our results, as well as Dittmar's (2004) aforementioned theory, somewhat overlapped with Rose's (2007) finding of materialism mediating the association between narcissism (arguably a compensatory personality trait for low self-esteem) and compulsive buying. As such, future related research should consider incorporating culturally attuned measures of self-esteem and narcissism in order to determine their potential roles in this pathway to compulsive buying. In this pathway, the mediator of irrational buying-related cognitions might subsequently aggravate the impact of materialism on compulsive buying via illusory beliefs in one's ability to control, influence, and predict buying outcomes (e.g., that desired goods can only be purchased at certain times and locations, or with certain preparative methods, and that successful purchases of certain goods signal the enhanced probability of similar future purchases), interpretative fallacies concerning unsuccessful purchasing opportunities (e.g., that such "failures" represent increased chances of future purchasing successes), as well as via the perception of one's inability or helplessness to stop buying (similar to dependency in gambling and substance addictions). This also resonated with previous findings of associations between irrational cognitions and other addictive behaviors like substance use and pathological gambling (Beck, Wright, Newman, & Liese, 1993; Raylu & Oei, 2004).

The present study contributed significantly to the compulsive buying literature by testing and uncovering gender differences in psychological pathways in a Chinese college sample. However, our interpretations were limited by several methodological weaknesses. For example, convenience sampling of participants was carried out. Therefore, it remained unclear to what extent participants were representative of the wider Chinese population in Hong Kong and Macau. Although monthly income was indeed limited in our college sample, compulsive buying operated independently of participants' monthly income (or lack thereof). It is possible to imagine that participants who do work and earn a monthly income might accommodate their compulsive buying tendencies by addictively purchasing items that do not cost much individually. However, additional information on other sources of buying power (e.g., allowances) was not collected, and this could similarly limit the generalizability of our findings to, say, Chinese individuals in Hong Kong and Macau employed in full-time, paid occupations. The cross-sectional design of the study, as well as the theory-driven placement of variables on the pathways, also did not allow for causal inferences among variables. Lastly, methodological concerns similar to other compulsive buying studies, such as a reliance on self-report measures that were susceptible to social desirability responses, as well as the absence of external validation by observed buying

behavior, were also applicable here. These limitations should be appropriately addressed in future related research.

## CONCLUSIONS

In summary, established psychological contributors to compulsive buying were supported for a Chinese college sample. The proposed mood compensation pathway was female specific, while the proposed irrational cognitive pathway was gender invariant. Additionally, the irrational cognitive pathway to compulsive buying took precedence regardless of gender.

These findings suggest that gender-dependent mechanisms should be considered for compulsive buying treatment. Specifically, in males (or at least, male Chinese college students), plans to target mood compensation processes might be secondary to the need to address irrational buying-related cognitions. There is thus a strong need for cognitive restructuring procedures targeting such cognitions to be formulated and tested (see Lourenço Leite, Martinho Pereira, Egidio Nardi, & Cardoso Silva, 2014). Clinical intuitions about the important role of irrational beliefs in driving compulsive buying (Filomensky & Tavares, 2009; Sohn & Choi, 2012) support this proposal. For example, intensive psychoeducation about the irrational and behaviorally reinforcing nature of such cognitions could be carried out, alongside extensive behavioral experiments to challenge and correct such beliefs. In females (or at least, female Chinese college students), cognitive-behavioral techniques that additionally address negative affectivity and stress and/or avoidant coping tendencies in response to such distress might also help reduce compulsive buying.

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*Conflict of interest:* The authors declare no conflict of interest.

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