

How psychological factors boost compulsive buying behavior in digital era

A case study of Indonesian students

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Abstract

Purpose – To find the root of the problem for compulsive buying behavior of students in the digital era by exploring psychological factors such as materialism, self-esteem, self-control, narcissism, money attitude and mood as boosters of the effect of income on compulsive buying behavior.

Design/methodology/approach – The unit of analysis in this research was a group of students having experience using e-commerce. The data collection method in this study was a closed questionnaire with a scale of 1–5 agree–disagree intervals distributed to 250 students who have shopping experience through e-commerce. WARP-PLS statistics was used.

Findings – The study shows that self-esteem and mood do not moderate the effect of income on compulsive buying behavior. Meanwhile, materialism, narcissism, self-control and money attitude can significantly moderate the effect of income on compulsive buying behavior.

Research limitations/implications – That the data used is only limited to students in Central Java Province; so for future research, it is necessary to expand data to different provinces or different countries. This research has implications that the synthesis between mainstream conventional economic thought and behavioral economics can be tested well in this model.

Originality/value – This study is proof of the synthesis between conventional and behavioral economic thought, which is a solution to the contradiction of the neoclassical paradigm of thought and behavioral economic thought in understanding consumer behavior, especially in compulsive buying behavior.

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1. Introduction

The phenomenon of the fourth industrial revolution raises the increasing consumer desire accompanied by increased purchasing power. This has an impact on habits and lifestyles, which also change in a relatively short period of time toward becoming increasingly luxurious and excessive (Ekapaksi, 2016). The phenomenon of online shopping is very easy, encouraging students to behave compulsively, where the behavior is no longer to meet the needs, but based on mere desire, even they tend not to be able to control the desire to shop (Lejoyeux and Weinstein, 2010). Such changes in consumption behavior are certainly in contrary to conventional economic theory. According to Deshpande (2011), the basis of conventional economic theory is rational consumer demand, where the consumer demand is analyzed in quantitative rather than qualitative terms, thereby ignoring subjective factors such as personality, attitude, social class, preferences, cognition, social environment and culture (Deshpande, 2015). However, in its development, several critical lawsuits over the theory began to be massive. Mas-Colell *et al.* (1995) and Binder (2010) argued that consumer preferences are assumed to be fixed, and only focus on maximizing the utility function is not significantly proven so that the relevance of the assumption of rationality cannot be absolutely justified (Bernheim and Rangel, 2009). Therefore, behavioral economics appears



that bases a psychological perspective on understanding consumption. In this context, humans are predicted as organic machines, so it makes no difference controlling people's behavior than controlling machines, through behavioral techniques that condition emotional responses or stimuli (DiClemente and Hantula, 2000, 2003). So that consumer decisions are often irrational and influenced by feelings and sentiments, motives, attitudes, subjective biases and heuristics in information processing, as well as social influences from family or peer groups (Traut-Mattausch *et al.*, 2008).

The irrational buying decisions have been studied by several experts. One of them is compulsive buying. This behavior has characteristics such as spontaneous decisions, symbolic meaning, social visibility, a large amount of money used and the limited knowledge possessed (Kirchler *et al.*, 2001; Kirchler and Hoelzl, 2011). Compulsive buying is a psychoeconomic phenomenon that often afflicts people's lives where this behavior takes the form of repeated purchases as a result of unpleasant events or negative feelings caused by addictions, stress or boredom (Faber and O'Guinn, 1989; Solomon, 2002). Compulsive buying can also be interpreted as a form of purchase with weak control or excessive desire for spending and spending behavior, the consequences of which are detrimental (Black, 2001). Compulsive buyers on average are in their teens or early 20s, although it does not rule out individuals who are in their early 30s (Mc Elroy *et al.*, 1994; Gwin *et al.*, 2004). The impact of compulsive buying is very worrying, which is generally detrimental, in terms of both economic and psychological culprit such as high credit card arrears, excessive personal debt, low savings, entangled legal cases, the emergence of feelings of inferiority, guilt, depression, anxiety, frustration and the emergence of interpersonal conflict (Mangestuti, 2014).

One of the root causes of compulsive buying is influenced by income. Based on conventional economic theory, research findings from Zhang *et al.* (2017) showed that household income before tax significantly influences compulsive purchases, while findings from Steve (2014) showed that students with high-income levels also have a significant influence on purchases compulsively. Ergin (2010) also explained the same findings in Turkish society. However, several research findings such as (O'Guinn and Faber, 1989; Scherhorn *et al.*, 1990; Mueller *et al.*, 2011; Unger, *et al.*, 2014; Leite and Silva, 2015) showed that income does not have a significant relationship to purchasing behavior compulsive. The inconsistency of the research findings indeed becomes an important issue, because humans as compulsive buying decision-makers apparently are motivated by psychological factors, as in the findings of Kellet and Bolton (2009) and Claes *et al.* (2010), which showed that compulsive buying has negative reinforcing properties and is used to escape negative feelings such as anxiety, depression, tension, or boredom. Besides, other psychological factors such as negative mood, materialism, depression, low self-esteem, perfectionism, difficulty in decision-making and narcissism have been proven to be related to compulsive buying (Faber and Christenson, 1996; Dittmar, 2005; Kyrios, *et al.*, 2004; Rose, 2007). As a solution to the research gap, this study examines several psychological factors such as materialism, self-esteem, self-control, narcissism, money attitude and mood as moderators of income effects on compulsive buying behavior.

2. Literature review

2.1 Compulsive buying theory

Edwards (1993) stated that compulsive buying is a behavior that has the characteristics of preoccupying oneself with buying activities or the desire to buy that is unbearable, disturbing and uncontrolled, where this is associated with buying goods repeatedly that is not controlled or shopping for a longer period than planned. Mowen (2002) defined compulsive buying as a response to an uncontrollable urge to obtain, use or experience a feeling, substance or activity that guides an individual to repeatedly engage in ultimately detrimental behavior. Compulsive buying behavior is a repetitive and acute buying behavior,

which is the main response to deal with feelings or unpleasant events such as sadness, depression, frustration. This compulsive buying behavior is one of the main objectives, namely improving mood (O'Guinn and Faber, 1989). According to O'Guinn and Faber (1989), compulsive buying has all the following characteristics: 1) have a strong desire to get something, 2) have a strong desire to use new item, 3) uncontrolled desire to do buying, 4) directly go shopping every time the buying desire appears, 5) get accustomed to buy more than one item when shopping.

2.2 Income

The practical definition of income requires an accounting period and a measure of welfare as a calculation method. Income can be defined as a calculation of the amount of consumption plus changes in net worth as realized during the year (Smeeding and Weinberg, 2001). Revenue can also be defined as the sum of the market values of the rights that can be consumed and changes in the value of storage of property rights between the beginning and end of the period in question (Steve, 2014). In relation to compulsive buying, findings from Steve (2014) showed that the level of student income together positively influences compulsive buying behavior among students, where high-income levels have a dominant influence on compulsive buying among students. The findings from Ergin (2010); Zhang, *et al.*, 2017 also showed that income levels have a significant influence on compulsive buying behavior among people with high monthly income levels, as well as in young people. From the way of thinking supported by previous research, it can be formulated that:

H1. Revenue influences compulsive buying behavior

2.3 Materialism

Materialism is defined as a trait covering three things: the attitude of anger, not being generous and jealousy, Belk (1984). Measurement of materialism is a multidimensional matter that includes not only character but also behavior and values such as one's judgment about wealth as a symbol of success, wealth as a source of pleasure and the belief that more wealth causes happiness (Richins and Dawson, 1992). The relationship between materialism and compulsive buying has become important because it has been observed that both affect behavior and consumer welfare (Roberts *et al.*, 2003). The findings from Dittmar (2004) showed that those who have materialistic values tend to be more worried about their finances and also tend to behave in compulsive buying behavior. Meanwhile, Belk (1995), Watson (2003) argued that materialism makes one addicted to expenditure and feels jealous when others show greater ownership. Consumer culture such as materialism is one of the main factors that contribute to compulsive buying behavior (Belk, 1985). This is evident that the compulsive buying behavior of Indian consumers has been described as having a high materialistic tendency (Gupta, 2011). Therefore, the nature of materialism should be expected to be a reinforcement of the relationship between income and compulsive buying behavior, because psychological factors such as materialism are often more holistic to predict consumer behavior such as compulsive buying behavior (Buckley, 1982; DiClemente and Hantula, 2003). Based on the way of thinking supported by the previous research, the following hypotheses can be formulated.

H2. Materialism influences compulsive buying behavior

H3. Materialism moderates the effect of income on compulsive buying behavior

2.4 Self-esteem

Self-esteem is defined as a positive or negative attitude toward one self. According to Myers (2012), self-esteem is one's personal judgment based on whether or not his behavior meets his

self-evaluation as well as self-ideal. According to [Baron and Branscombe \(2012\)](#), self-esteem is a self-judgment or evaluation made by an individual as an attitude toward oneself in terms of positive–negative. Low self-esteem has been accepted as an important motivation for the desire to buy as well as in compulsive buying ([D’Astous, 1990](#); [Roberts, 1998](#)). Compulsive buying behavior is certainly a form of consumer decision in particular rarely following the normative irrational choice model, so it certainly can be used as a moderator of the impact between income and compulsive buying ([Traut-Mattausch et al., 2008](#)). Based on the way of thinking supported by the previous research, the following hypotheses can be formulated.

H4. Self-esteem influences compulsive buying behavior

H5. Self-esteem moderates the effect of income on compulsive buying behavior

2.5 Self-control

The concept of self-control refers to efforts to override or change a person’s dominant response tendencies and interfere with undesirable behavior ([Baumeister, 2002](#); [Baumeister et al., 2004, 2008](#); [Baumeister and Vohs, 2004](#)). This self-control scale is measured through four main domains, namely self-control: controlling thoughts, emotions, performance and impulses ([Baumeister et al., 2004](#)). [Billieux et al. \(2008\)](#) revealed that a high level of self-control influences the decline in compulsive buying behavior. The study shows that three aspects of self-control such as no urgency, lack of perseverance and lack of planning negatively correlated with compulsive buying. [Otero-López and Villardefrancos Pol \(2013\)](#) also reported that individuals with a high tendency to buy compulsively show low scores on controlling both aspects of fulfilling moral obligations and self-discipline. The findings from ([Tangney et al., 2004](#)) also confirmed that the relationship between self-control and compulsive buying is negative and significant. As a form of psychological factor, of course, self-esteem also has an impact on behavioral control or control, so that it is possible with the self-esteem of consumption behavior such as compulsive purchases can be moderated through emotional stimuli such as self-esteem ([DiClemente and Hantula, 2000](#)). Based on the way of thinking supported by the previous research, the following hypotheses can be formulated.

H6. Self-control influences compulsive buying behavior

H7. Self-control moderates the effect of income on compulsive buying behavior

2.6 Narcissism

Narcissism is defined as a personality trait characterized by selfish, self-raising, dominant and manipulative behaviors ([Miller and Campbell, 2008](#); [Pincus; Lukowitsky, 2010](#)). Narcissism is driven by a strong need for admiration and recognition, combined with difficulties in regulating these needs. The relationship between narcissism and compulsive buying has been investigated by several researchers. [Rose \(2007\)](#) examined narcissism, materialism and impulse control as correlations of problematic buying behavior in student consumers. She found that narcissism (as a common entity) increases the possibility for compulsive buying, whereas [Sedikides et al. \(2007\)](#) showed that narcissism can have an impact on consumer behavior because it can validate the self-view that is too positive from narcissists; that is, a product can help a narcissist feel good. Of course, it can be suspected that people who have high incomes can be affected by compulsive buying behavior, because narcissism and compulsive buying contain elements of obsessive-compulsive behavior, thus affecting the lack of impulse control ([Vazire and Funder, 2006](#); [Ridgway et al. 2008](#)). Based on the way of thinking and previous research, the following hypotheses can be formulated.

H8. Narcissism influences compulsive buying behavior

2.7 Money attitude

Money has become the most emotionally meaningful object in modern life because it is incorporated into individual lives and stimulates comparative behavior between themselves and others in ways that include social power, control, quality and freedom (Medina *et al.*, 1996). Yamauchi and Templer (1982) described Money attitude scales, which consist of three main dimensions, namely 1) the dimension of power prestige shows that individuals believe that money is a symbol of success; 2) the time-retention dimension explains that individuals use money as a means to plan and prepare for the future; 3) quality dimensions, which show that individuals also view money as a means to buy high-quality products and services. Compulsive buyers more often buy goods to impress others and tend to consider shopping activities as satisfying activities, thus motivating to buy on a large scale (Lejoyeux *et al.*, 2007). Meanwhile, Elliott (1994) noted that one of the main functions of compulsive buying is subjective perceptions of their high income so that they prioritize socially desirable appearance, which is influenced by their money attitude. Consumers who continually improve attitudes toward money are often deceived by the goods they buy, because of the compulsive purchases they make (Roberts and Jones, 2001). Individuals who have beliefs about money are more likely to buy high-quality products regardless of their income so that projections of emotional and psychological values about money cause irrational actions (Chang and Arkin, 2002); then the following hypotheses can be formulated.

H10. Money attitude influences compulsive buying behavior

H11. Money attitude moderates the effect of income on compulsive buying behavior

2.8 Mood

Although there is evidence of mood swings, one in four consumers tend to make compulsive purchases based on mood swings that arise when shopping (Faber and Christenson, 1996; Faber and Vohs, 2004), and usually mood swings affect a person's high arousal (McElroy *et al.*, 1994). Some studies illustrate that compulsive buyers retrospectively report changes in mood that are greater than before than controls on mood (Dittmar, 2005). Mood and self-esteem are the main motivations for compulsive buying (Faber, 2000; Faber and Christenson, 1996; O'Guinn and Faber, 1989; Pooler, 2003). Scherhorn *et al.* (1990), Belk (2000), Pooler (2003) emphasized that the act of purchasing enables compulsive buyers to align their self-perceptions with those desirable where the envy or admiration they feel toward others is imagined to be felt by others toward themselves. So even though it is included in the low-income class, compulsive consumption behavior, such as binge eating, is found to be often preceded by mood such as sadness (Yanovski *et al.*, 1993). Therefore, the following hypothesis can be formulated (see Figure 1).

H12. Mood influences compulsive buying behavior

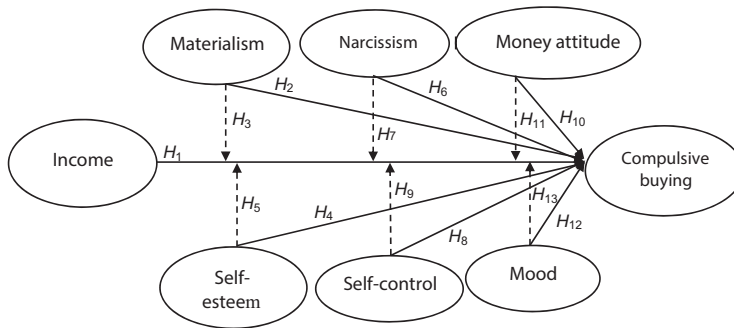
H13. Mood moderates the effect of income on compulsive buying behavior

Based on the literature review and hypothesis development, it can be described in the empirical framework of this research as follows:

3. Methodology

The data used in this study are primary data obtained by distributing research questionnaires to student respondents who have experienced shopping through e-commerce that is spread in Central Java Province because the largest number of students in Indonesia is in the

Figure 1. Research empirical model



Province of Central Java (Indonesian Statistics Bureau /BPS, 2019). The sample size of this study refers to the recommendations of Kock and Hadaya (2018) using the inverse square root method, which states the best sample in PLS-SEM analysis is 160. In the implementation of questionnaire distribution to avoid lack of research data, we sent random questionnaires to 250 students in March 2019. Then from the 250 student questionnaires, it turns out that only the questionnaire rate, which could be analyzed by 65 percent or a number of 165 respondents, was obtained in March–August 2019 (see Table I and Table II).

3.1 Variable and measurement

The measurement scale used in this study on materialism variables, self-esteem, self-control, narcissism, money attitude, mood, compulsive buying, is the Likert scale 1–5 agree/disagree, where each item is provided a range of extreme angles of scale, strongly agree and strongly disagree, based on the proxy of the measurement scale of experts, while for the measurement of income variables with a ratio scale, where information on the amount of income written on the questionnaire was directly used in inferential statistical analysis. Measurement of compulsive buying behavior is done by measuring two main dimensions, namely obsessive-compulsive buying behavior and impulsive buying (Edwards, 1993). Revenue is measured by the amount of allowance earned by students each month (Steve, 2014). Measurement of materialism is by looking at student responses about wealth as a symbol of success, a source of pleasure and a source of happiness (Richins and Dawson, 1992)

Variable	Average	Category
Materialism	25.406	High
Self-esteem	30.736	High
Self-control	103.703	Medium
Narcissism	52.186	Medium
Money attitude	35.912	Medium
Mood	51.648	High
Compulsive buying	27.109	High

	Average	Min	Max	Std. Deviation
Income	Rp2,829,670.33	Rp800,000	Rp5,000,000	Rp1,243,605.377

Table I. Variable description

Table II.
Loading, AVE, cross-loading and composite reliability for the measurement (outer) model

Indicator	CB	MTR	SE	SC	NRS	MA	MD	Inc	AVE	Composite reliability
CB6	0.727	-0.211	-0.038	-0.070	0.282	0.140	0.109	-0.039	0.533	0.802
CB7	0.836	0.028	0.021	0.164	0.010	0.038	-0.060	-0.082		
CB8	0.691	-0.084	-0.087	-0.014	-0.126	-0.173	-0.017	0.176		
CB9	0.718	0.237	-0.003	0.131	-0.122	-0.081	0.045	0.234		
CB10	0.759	0.024	0.116	0.056	-0.215	-0.071	-0.067	-0.092		
CB11	0.635	-0.000	-0.024	-0.335	0.196	0.156	0.001	-0.192		
MTR1	0.731	0.731	0.129	-0.135	-0.060	-0.170	0.157	-0.093	0.583	0.813
MTR2	-0.226	0.705	-0.202	0.098	-0.013	0.109	-0.118	0.039		
MTR3	-0.023	0.739	-0.013	-0.201	0.129	-0.010	0.139	0.215		
MTR5	0.244	0.636	-0.028	0.268	0.129	0.162	-0.061	0.029		
MTR6	-0.049	0.659	0.114	0.012	0.041	-0.073	-0.145	-0.208		
SE1	0.077	0.006	0.833	-0.017	-0.021	-0.151	-0.159	0.083	0.694	0.820
SE6	-0.077	-0.006	0.833	0.017	0.021	0.151	0.159	-0.083		
SC1	-0.165	0.046	0.000	0.723	0.017	-0.046	0.147	-0.006	0.584	0.817
SC2	-0.025	0.092	-0.089	0.806	0.099	-0.026	-0.012	0.136		
SC12	0.273	0.035	0.117	0.639	-0.148	0.170	-0.243	-0.095		
SC15	-0.060	-0.218	-0.005	0.595	0.005	-0.091	0.098	-0.075		
NRS11	-0.139	0.062	0.358	-0.343	0.691	-0.056	0.105	0.090	0.529	0.802
NRS12	0.080	-0.154	0.022	0.058	0.909	-0.073	-0.119	-0.029		
NRS13	-0.046	0.156	-0.223	0.115	0.845	0.034	-0.034	-0.012		
NRS16	0.196	-0.111	-0.252	0.277	0.616	0.240	0.203	-0.081		
MA7	0.173	-0.052	0.096	0.252	0.012	0.797	0.004	-0.079	0.696	0.896
MA8	0.111	-0.503	-0.010	0.021	0.309	0.666	-0.062	0.283		
MA10	-0.045	0.048	-0.061	0.135	-0.200	0.676	-0.107	-0.187		
MA11	-0.271	0.515	-0.044	-0.458	-0.120	0.668	0.166	0.001		
MD9	-0.157	0.297	0.060	-0.028	0.174	-0.040	0.813	-0.057	0.661	0.796
MD10	0.157	-0.297	-0.060	0.028	-0.174	0.040	0.813	0.057		
Inc	-0.000	-0.000	0.000	-0.000	-0.000	0.000	0.000	1.000	1.000	1.000

Notes: CB (Compulsive Buying); MTR (Materialism) SE (Self-Esteem); NRS (Narcissism); MA (Money Attitude); MD (Mood); Income (Inc)

Measurement of self-esteem is by looking at responses on a scale of self-esteem measurement of 10 items (Rosenberg, 1965).

Self-control is measured by looking at students' responses in stopping bad habits, resisting temptation and maintaining self-discipline, with reference to Tangney, Baumeister and Boone's self-control scale (SCS). Narcissism is measured by looking at the response of student behavior on the dimensions of authority, exhibitionism, superiority, entitlement, exploitation, self-sufficiency and vanity (Raskin and Terry, 1988). Attitudes toward money are measured using a money attitude scale (MAS) (Yamauchi and Templer's, 1982). Mood is measured by seeing the response of positive or negative emotional states of students with high positive activation dimensions (enthusiastic, excited, cheerful), low positive activation (calm, relaxed, peaceful), high negative activation (anxiety, hostility, stress) and low activation negative (sad, depressed) (Barrett and Russell, 1999).

3.2 Data analysis

The first thing to do is to get a good measurement scale construction, carrying out a pilot test; the results of the pilot test are then used as a reference in the field test. After the data collected from the field test, a descriptive analysis is then performed describing the conditions of income, materialism, self-esteem, self-control, narcissism, money attitude, mood, compulsive buying using the calculation of index numbers using percentages. Then proceed to inferential statistical analysis using WARP PLS-SEM, namely (1) conceptualization of the model; (2) determine the analytical method of algorithm; (3) determine the resampling method, (4) illustrate the path diagram; (5) evaluate and estimate the inner model, or outer model, with the PLS mode A basic Warp algorithm, to find out the value of t statistics; and (6) report the results of the analysis (Kock, 2019).

4. Empirical results and discussion

4.1 Variable description

This analysis is carried out to obtain an overview of the data collected on each variable. Based on these calculations, an average is then classified. For the variables materialism, self-esteem, self-control, narcissism, money attitude, mood, compulsive buying, the average value is classified into five criteria, namely very low, low, medium, high and very high. While for income variable, the average, maximal, minimum and standard deviation values are calculated. From this analysis, materialism, self-esteem, mood and compulsive buying are included in the high category. As for the description of the variables, self-control, narcissism and money attitude are included in the medium category. Whereas the condition of student income has an average of 2.8 million rupiahs, with a minimum income of Rp800,000, and a maximum income of five million, with a standard deviation of around 1.2 million. The table is as follows.

4.2 Measurement model analysis

Statistical test results on the evaluation of the measurement model in the PLS Warp analysis were conducted to test the construct validity and reliability (Kock, 2019). Assessment at this stage aims to determine whether each item of the instrument used to measure the constructs of variable manifest/indicator of latent variables (income, materialism, self-esteem, self-control, narcissism, money attitude, mood, compulsive buying) meets the criteria of convergent validity. The construct validity test consisting of convergent validity and discriminant validity as well as construct reliability is provided in Table III.

It can be seen in Table III that the loading factor values of each indicator can be declared to have met the criteria of convergent validity because the value of loading factors on income, materialism, self-esteem, self-control, narcissism, money attitude, mood, compulsive buying

variables is ≥ 0.5 . Meanwhile it is also strengthened at the AVE (average variance extracted) value of more than 0.5, so that it also shows that all these indicators can explain the construct variable as greater than 50 percent; therefore, in terms of loading factors per indicator or AVE value shows that the convergent validity of each variable has been fulfilled. All indicators in this study also meet the requirements of the validity criterion. This can be shown through cross-validation between the amount of loading of the indicator factor and the variable compared to the magnitude of the indicator against the other variables. Loading factor is greater than the value of loading factors other than these variables. The results of the construct reliability test also showed that the composite reliability value of each variable showed a value greater than the cutoff value of 0.7. So it can be concluded that all variables have met the construct reliability criteria.

4.3 Global fit and hypothesis test

After the outer model test is fulfilled, the global fit test is then performed, which consists of the model fit and quality indices test. This test is conducted to determine the suitability of the inner model in empirical situations so that the results of hypothesis testing are feasible to be interpreted. There are 10 indices tested in the fit and quality indices model test, including the average path coefficient (APC); average R -squared (ARS); average adjusted R -squared (AARS); average block VIF (AVIF); average full collinearity VIF (AFVIF); Tenenhaus GoF (GoF); Simpson's paradox ratio (SPR); R -squared contribution ratio (RSCR); statistical suppression ratio (SSR); nonlinear bivariate causality direction ratio (NLBCDR (Kock, 2018), where the value of these indices must be above the cutoff value. **If all indexes have scores above the cutoff value, then the model can be justified as a fit model and can be used for hypothesis testing.** Following are the results of the fit and quality indices model test.

Based on the results of the fit and quality indices model test in Table III, all of the types of tests can be stated that the model as a whole either the measurement model or the structural model is declared fit so that it can be used to test the hypotheses in this study. The results of hypothesis testing and path coefficients can be explained in the following table.

Table IV illustrates the results of the hypothesis test and the coefficient magnitude using the WarpPLS SEM statistical method. The table shows that the four hypotheses (H1), (H4),

Index	Cut off value	Score	Remarks
Average path coefficient (APC)	$P < 0.05$	0.150, $P = 0.003$	Good
Average R -squared (ARS)	$P < 0.05$	0.316, $P < 0.001$	Good
Average adjusted R -squared (AARS)	$P < 0.05$	0.282, $P < 0.001$	Good
Average block VIF (AVIF)	$P < 0.05$	2.644	Good
Average full collinearity VIF (AFVIF)	Acceptable if ≤ 5 , ideally ≤ 3.3	1.639	Ideal
Tenenhaus GoF (GoF)	Acceptable if ≤ 5 , ideally ≤ 3.3	0.415	Good
Simpson's paradox ratio (SPR)	Acceptable if ≥ 0.7 , ideally = 1	0.748	Good
R -squared contribution ratio (RSCR)	Acceptable if ≥ 0.9 , ideally = 1	0.923	Good
Statistical suppression ratio (SSR)	Acceptable if ≥ 0.7 , ideally = 1	0.923	Good
Nonlinear bivariate causality direction ratio (NLBCDR)	Acceptable if ≥ 0.7	1	Ideal

Table III.
Model fit and quality indices

(H6), (H8), (H10) were accepted statistically, with p -values below 0.05. This shows that income, materialism, self-esteem, self-control, narcissism and money attitude influence the compulsive buying behavior. However, in (H12), it is not supported by statistical results with a p -value = 0.205 or above a cutoff value of 0.05. While moderation testing shows that (H3), (H6), (H8) and (H10) can be supported statistically, it can be seen that the p -value of these hypotheses is below 0.5. Therefore, this study proves that materialism, self-control, narcissism and money attitude can significantly enable the influence of income on compulsive buying behavior. While the tests (H5) and (H13) were not supported statistically because the p -values were 0.172 and 0.104 or above the cutoff value of 0.05, this study showed that self-esteem and mood could not moderate the effect of income on significant compulsive buying behavior.

4.4 Discussion

Income empirically is still proven to influence compulsive buying behavior **as stated in hypothesis 1**; this still reinforces conventional economic theory where rationality is a determinant in consumption behavior (Deshpande, 2015). This research shows that compulsive purchases made by these students have depended on their income, in line with the findings of Steve (2014), which showed that the level of student income has a positive and dominant influence on student compulsive buying behavior. In this finding, the income of students who are relatively young and also have enough income for them is also inclined to increase their compulsive purchases; this is also in line with the findings of Ergin (2010); Zhang *et al.* (2017), which showed that the level of income has a significant influence on compulsive buying behavior among people with high monthly income levels, as well as on young people. In terms of materialism, the results of hypothesis testing indicate that materialism as either an independent or a moderating variable is also proven to be able to increase compulsive buying behavior. **These finding supports hypothesis 2 and hypothesis 3. This shows the nature, values, symbols and beliefs held by students regarding wealth as a symbol of success, a source of pleasure and a source of happiness as an element of materialism have an impact on compulsive buying behavior** (Belk, 1984; Richins and Dawson, 1992). The findings from DiClemente

Hypothesis (relationship direction)	Coefficient	P -value	Cutoff value	Criteria
H ₁ Income → compulsive buying behavior	0.173	0.002	0.05	Accepted
H ₂ Materialism → compulsive buying behavior	0.251	<0.001	0.05	Accepted
H ₃ Materialism*Income → compulsive buying behavior	0.194	<0.001	0.05	Accepted
H ₄ Self-esteem → compulsive buying behavior	-0.309	<0.001	0.05	Accepted
H ₅ Self-esteem*Income → compulsive buying behavior	0.057	0.172	0.05	Rejected
H ₆ Self-control → compulsive buying behavior	-0.323	<0.001	0.05	Accepted
H ₇ Self-control*Income → compulsive buying behavior	-0.193	<0.001	0.05	Accepted
H ₈ Narcissism → compulsive buying behavior	0.160	0.004	0.05	Accepted
H ₉ Narcissism*Income → compulsive buying behavior	0.137	0.011	0.05	Accepted
H ₁₀ Money attitude → compulsive buying behavior	-0.161	0.003	0.05	Accepted
H ₁₁ Money attitude*Income → compulsive buying behavior	-0.140	0.009	0.05	Accepted
H ₁₂ Mood → compulsive buying behavior	0.049	0.205	0.05	Rejected
H ₁₃ Mood*Income → compulsive buying behavior	-0.076	0.104	0.05	Rejected

Table IV.
Path coefficient and hypothesis test

and Hantula (2003) also indicated that the nature of materialism should be expected to be a reinforcement of the relationship of income with compulsive buying behavior. That is because psychological factors in understanding consumer behavior are often more likely to predict consumer behavior such as compulsive buying behavior.

Similar findings are also found in the case of self-control; this variable has been empirically proven to have a negative impact on compulsive buying behavior, and besides that self-control can also effectively moderate the effect of income on compulsive buying behavior **and support hypothesis 6 and hypothesis 7**. These results indicate that self-control is effectively able to rule out or change the tendency of a person's dominant response and disrupt unwanted behavior (Baumeister, 2002; Baumeister, *et al.*, 2008; Baumeister and Vohs, 2004), where one's self-control is good in controlling thoughts, emotions, performance and impulse, which increase compulsive buying behavior. In line with this finding, Otero-López and Villardefrancos (2013) reported that individuals with a high tendency to buy compulsively show low scores on aspects of obedience to fulfill moral obligations and self-discipline. Meanwhile, someone who is able to exercise control may be able to reduce the impact of someone who has a high income on compulsive buying behavior (DiClemente and Hantula, 2000). In the money attitude variable, although empirically money attitude influences compulsive buying behavior, the effect is negative. **These findings support hypothesis 10 and hypothesis 11**. This is because emotionally, money is in the lives of individuals so as to stimulate compulsive behavior (Medina *et al.*, 1996). Compulsive buyers often tend to find their purchases personally satisfying, motivating to buy on a large scale (Lejoyeux *et al.*, 2007), so consumers who continually improve their attitude toward money or have confidence about more money are often deceived by goods that they buy, and whose ambition is to buy up goods regardless of their income (Roberts and Jones, 2001).

In the context of narcissism, the variable description shows that narcissism of students is of high category; this means that students have selfish, self-aggrandizing, dominant and manipulative behaviors so that this has significant effect on compulsive buying behavior and supports **hypothesis 8 and hypothesis 9**. These findings are in line with the findings of Rose (2007), who found that narcissism (as a common entity) increases the likelihood of compulsive buying. Meanwhile, other research shows that hypersensitivity narcissism (a synonym for vulnerable narcissism) significantly increases the likelihood of compulsive buying (Jung and Yi, 2013). Narcissism validates overly positive self-views from narcissists; that is, a product can help narcissists feel good (Sedikides *et al.*, 2007) so that people who have high incomes can be affected by compulsive buying behavior, because narcissism and compulsive buying contain elements of obsessive-compulsive behavior, thus affecting the lack of impulse control (Vazire and Funder, 2006; Ridgway *et al.* 2008).

Different conditions exist in the phenomenon of self-esteem. Empirical self-esteem has a negative effect on compulsive buying behavior, but self-esteem does not moderate the effect of income on compulsive buying behavior. **So these results support hypothesis 4, but do not support hypothesis 5**. This reinforces the influence (Faber and O'Guinn, 1989; D'Astous, 1990; Roberts, 1998) where self-esteem influences compulsive buying behavior. This is because self-esteem is a key indicator of psychological assessment. As a matter of self-respect, self-esteem is made by every individual who thinks that he is very exclusive so that he can ignite to do excessive and irrational spending (Báron and Branscombe, 2012). Meanwhile, self-esteem shows high criteria, but this does not accompany an increase in people's desire for consumption. So this finding confirms that students with high self-esteem do not increase their desire for compulsive buying behavior despite high income. This finding has the support of research (Biolcati, 2017), which showed that if self-esteem is high, then it tends not to behave compulsively.

The empirical mood does not affect compulsive buying behavior or moderate the effect of income on compulsive buying behavior. **This finding does not support hypothesis 12**

and hypothesis 13. This is empirically contrary to the research conducted by Dittmar (2005), Faber (2000), Faber and Christenson (1996), O'Guinn and Faber (1989), Pooler (2003), which showed that mood is the main motivation for compulsive buying. However, the mood did not affect compulsive buying because the mood owned by students was high that they had a tendency to feel happy; therefore, it does not support the existence of compulsive buying behavior (Belk, 2000; Pooler, 2003).

5. Conclusion and limitation

This study aims to explore how psychological factors such as materialism, self-esteem, self-control, narcissism, money attitude and mood increase the impact of income on student compulsive buying behavior. Empirical results indicate that psychological factors such as materialism, self-control, narcissism, money attitude can effectively increase the effect of income, but mood and self-esteem, in this case, cannot increase the effect of income on compulsive buying behavior. This finding is a proof of the synthesis between conventional and behavioral economic thoughts, which is a solution to the contradiction of the neoclassical paradigm of thought and behavioral economic thought in understanding consumer behavior, especially in compulsive buying behavior. **So this research has implication that conventional economics thinking is not weak as expected by behavioral economists, but with the presence of psychological factors as a moderator, it reinforces the notion that conventional economics needs to be supported by behavioral economics as scientific insight to understand economics, especially consumers' behavior holistically.** Limitation in this study is that the data used is only limited to students in Central Java Province; so for future research, it is necessary to expand data to different provinces or different countries.

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