# A COMPREHENSIVE STRUCTURAL EQUATION MODELING FOR E-IMPULSE BUYING

**Shalini Singh, DIT University**


## ABSTRACT

***Purpose:*** *The main purpose of this paper is to establish a comprehensive model for the antecedents of urges to buy impulsively (UBI) that finally leads to E-impulse buying and to measure the extent of effect of moderating variables over this model.*

***Design/Methodology/Approach:*** *An online survey has been done consisting 18 items at seven point scale. Total 223 respondents effectively completed this survey out of which 122 were male and 101 were female respondents. Amos 24 has been used to validate the reliability and robustness of the model.*

***Findings:*** *The study reveals significant impact of five dimensions of the antecedents of UBI on E-impulse buying. Moderating impact of moderating factors was also evaluated and found to be significant.*

***Implications:*** *This comprehensive model can be utilized by e-tailers to understand the shoppers' impulsive online purchase pattern by utilizing the impact of five dimensions of UBI on E-impulse buying in an optimal way that may help in generating higher sales revenue along with loyal customer base.*

***Originality/Value:*** *This study provide interesting insights and contributes in a comprehensive way in the research area of E-impulse buying by considering authentic inferences of online survey.*


**Keywords:** Urge to Buy Impulsively, Antecedents, E-impulse Buying, Moderating Factors.

## INTRODUCTION

The emergence of cashless economy and the expansion of online businesses drastically change the shoppers' purchase pattern as well as retail setting attributes. Researchers able to track the shopping patterns in online settings and found a significant number of purchases are on impulse. Adelaar, Chang, Lancendorfer, Lee & Morimoto, (2003) also advocated that consumers often encounter with urges to buy something impulsively and hence impulse purchases contribute magnificently in sales revenue. E-tailers in this internet prone era try to increase the sales revenue by creating more probability of encountering UBI on online shopping websites. And as only positive and satisfactory shopping experience lead to more impulse buying in future thus they are also trying to develop a paradigm that can provide higher shopping satisfaction. Therefore we can say that E-impulse buying is the phenomenon having utmost importance in this world of e-business so it is essential to get the deeper insights about this concept. This paper attempts to develop a comprehensive model for E-impulse buying by emphasizing over the all-important dimensions of UBI that ultimately leads to E-impulse buying.

# LITERATURE REVIEW

## E-impulse Buying

E-impulse buying can be defined as the spur-of-the-moment buying or a buying without a priori shopping intention in online context. Traditionally, Stern in 1962 derived major four types of impulse purchases: Pure impulse purchase; reminder purchase; suggestive impulse purchase; and planned impulse purchase. All these types of impulse purchases are linked with an unplanned buying behavior of shoppers. In online context several antecedents propel shoppers to buy something on impulse.

## Urge to Buy Impulsively (UBI)

Urge to buy impulsively can be defined as the sudden desire to buy a product while encountering various stimuli (Rook, 1987). It is a state of mind to experience spontaneous urge to buy while encountering an object in an environment (Beatty and Ferrell, 1998). And then consumers try to fulfil their spontaneous desire by buying that product. Hence it can be concluded as all the actual impulse purchases are encountered only after experiencing UBI (Rook, 1987). It is not mandatory that all the urges to buy impulsively can be converted in to impulse purchases but the likelihood of actual impulse purchases can be increased by developing more chances of experiencing UBI (Beatty and Ferrell, 1998).

## Contribution of Other Models in E-impulse Buying

Many researchers tried to capture the antecedents of UBI that further lead to E-impulse buying. Most of the studies in online context emphasize over the website related factors that create wide platform of experiencing UBI. Zhang, Prybutok & Strutton, in 2007 demonstrated the role of gender and subjective norms in influencing consumer impulsivity and actual impulse purchase. The impact of electronic service quality on the buying impulse shows significant results (Bressolles, Durrieu & Giraud, 2007). Parboteeah, Valacich & Wells, in 2009 also explored the significant impact of website quality in triggering impulse buying. The effect of online atmospheric cues also have significant impact on the online impulse buying (Floh and Madlberger, 2013; Liu, Li & Hu, 2013). Demographic factors like gender, marital status and income also influence impulse buying on internet (Jeffrey and Hodge, 2007; Kollat and Willet, 1967). Apart from website attributes and demographic factors, psychological attribute like impulse buying tendency, affective state and normative evaluation of an individual have a positive impacts on impulse buying (Dawson and Kim, 2009). Verhagen and Dolen in 2011 highlighted the positive impact of merchandise attractiveness, enjoyment and online store communication on impulse purchase. Other studies also reveal some important factors that may lead to E-impulse buying like-personality traits, emotions, social media, social capital and peer effect (Ozen and Engizek, 2014; Cheng and Tseng, 2014; Turkyilmaza, Erdem & Uslu, 2015; Huang, 2016).

## RESEARCH MODEL AND HYPOTHESIS

Literature review suggest the need of a comprehensive model that may include all the main dimensions of the antecedents of urge to buy impulsively that may ultimately lead to E-impulse buying. Different studies on impulse buying uncover several dimensions of UBI that stimulate E-impulse buying. The main dimension that is the foundation of UBI in online context is website attributes. In this study UBI is captured by considering all the factors that stimulate UBI in a comprehensive way. Thus UBI has been captured by five validated dimensions-website related factors; situational factors; promotional offers; impulse buying tendency and website communication. The UBI construct for this study will be captured by above mentioned five dimensions including sixteen items. E-impulse buying or actual impulse purchase on internet will be captured by two variables-EIB1: When I saw this product, I suddenly wanted to buy it; and EIB2: When I saw this product, I could not resist the desire to buy it. As it is obvious that E-impulse buying is preceded by urges to buy impulsively first hence it is clear that UBI has some relationship with E-impulse buying. Verhagen and Dolen in 2011, state the positive impact of UBI on impulse buying. Huang in 2016 also advocated UBI as the critical determinant of impulse buying in online context. Thus the first hypothesis generated over here is:

*H1. Urge to buy impulsively is positively related to E-impulse buying*

Researchers also argued over the impact of some demographic factors like – gender, marital status and income and on the relationship between UBI and E-impulse buying. Kollat and Willet (1967) advocated that consumer's characteristics and demographics also influence the impulse purchases. Dittmar, Beattie & Friese, (1995) also introduced gender as a factor that influences impulse buying of a product. Zhang, Prybutok & Strutton. (2007) through his model of relationships between genders, subjective norms, consumer impulsivity, purchase intention and actual purchase behavior in online marketing environments, derived that male consumers are more impulsive online shoppers than female consumers. From a socioeconomic point of view, individuals with relatively low levels of household income indulge into impulse buying. Hence we can consider income as a significant factor that may affect the incidences of E-impulse buying. Kollat and Willet (1967) advocated that impulse buying increases irregularly with increase in number of years of marriage. Marital status influences the shopping pattern of individuals for both planned and unplanned purchases. It is also observed that the time spend on internet by individuals will lead to more probability of encountering urges to buy impulsively due to various online stimuli. Jeffrey and Hodge (2007) advocated that the likelihood of impulse buying on internet is positively correlated to the amount spent on website prior to see an impulse item. Internet addiction and its impact on E-impulse buying are also observed to be significant (Sun and Wu, 2011). Therefore we can conclude that higher usage of internet leads to higher possibilities of encountering urges to buy impulsively on the internet and it will ultimately leads to more chances of E-impulse buying. So finally the hypothesis formulated from the above mentioned rationales are as follow:

*H2. Gender significantly moderates the relationship between urge to buy impulsively and E-impulse buying*

*H3.* *Income significantly moderates the relationship between urge to buy impulsively and E-impulse buying*

*H4.* *Marital status significantly moderates the relationship between urge to buy impulsively and E-impulse buying*

*H5.* *Internet usage significantly moderates the relationship between urge to buy impulsively and E-impulse buying*

Therefore the proposed model for the E-impulse buying will be reflected as the E-impulse buying impacted by UBI consisting five dimensions (website related factors, situational factors, promotional tools, website communication and impulse buying tendency) and this relationship of UBI and E-impulse buying will be moderated by gender, income, marital status and internet usage (Figure 1).

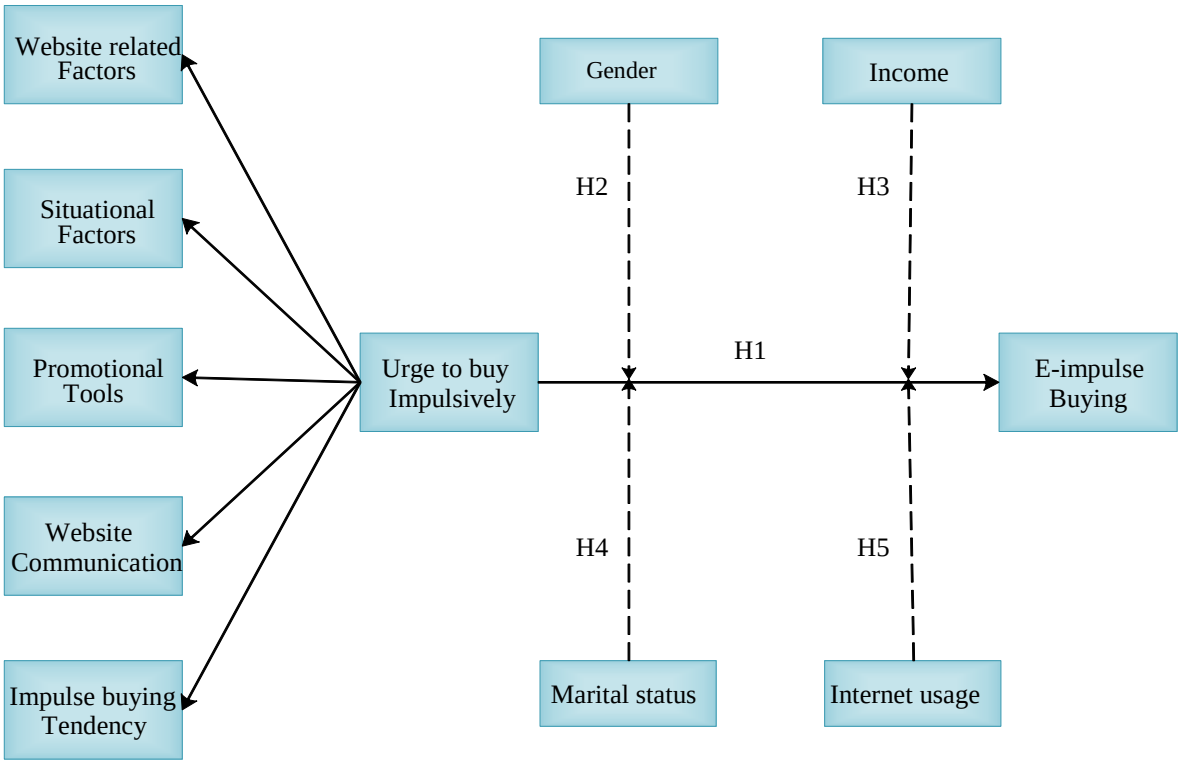


**FIGURE 1**
**PROPOSED MODEL FOR THE E-IMPULSE BUYING**

## METHODOLOGY

For this study sample data has been collected through online survey. The online questionnaire includes 18 items and few questions to collect demographic statistics of the respondents. Few questions were also asked to know about their internet usage and other related to shopping. 223 respondents effectively respond to this survey out of which 101 were female and 122 were male respondents (Table 1). To get the comprehensive scale for the antecedents of UBI first exploratory factor analysis was applied and to check the

relationship of UBI with E-impulse buying confirmatory factor analysis and structural equation modelling was applied by using Amos 24. Moderating effects of other variables on the relationship of UBI and E-impulse buying was also checked during the modelling by using Amos 24.

## DATA ANALYSIS AND RESULTS

### Sampling

Data was collected through online survey by using convenience sampling throughout the India from the online shoppers who often buy impulsively. The survey starts with an introductory note about the aim of the survey and it was directed that only those shoppers who often go for unplanned buying on the internet may carry forward with this survey. Finally 223 effective responses were received throughout the India. These respondents are from different regions of India and are from different demographic statistics.

### The Instrument

For capturing data from the respondents regarding E-impulse buying a questionnaire of 18 items at seven point Likert type scale ranging from 1) "strongly disagree" to 7) "strongly agree was constructed. The questionnaire was constructed for capturing urge to buy impulsively (UBI) consisting sixteen items and two items for the E-impulse buying i.e., actual impulse purchase in online context. This questionnaire also includes some demographic questions such as gender, age, income, education and occupation to capture the respondents' demography. Few other shopping related questions were also asked like internet usage, shopping probability and shopping experiences.

### Sample Characteristics

Table 1 exhibits the demographic details of the respondents. Out of 223 respondents 101 were female and 112 were male respondents. These respondents belong to diversified age groups, out of which 25 to 35 years age group entailed maximum respondents. The survey revealed that 49.3 percent of respondent are pursuing bachelors or hold a degree of bachelors (Table 1). Most of the respondents are from the income group 5 to 10 lakhs per annum and maximum number of respondents is employed.

**Table 1**
**DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS**

| | | GENDER | |
|---|---|---|---|
| | | **Female** | **Male** |
| **Age group** | 18 to 24 years | 27 | 68 |
| | 25 to 35 years | 65 | 42 |
| | 36 to 50 years | 8 | 10 |

| | | | |
|---|---|---|---|
| | More than 50 years | 1 | 2 |
| **Marital Status** | Married | 40 | 31 |
| | Unmarried | 61 | 91 |
| **Family Income (per annum)** | Less than 5 lakhs | 31 | 48 |
| | 5 to 10 lakhs | 44 | 58 |
| | 10 to 20 lakhs | 19 | 12 |
| | More than 20 lakhs | 7 | 4 |
| **Education** | Bachelors or less | 19 | 54 |
| | Masters or less | 60 | 55 |
| | Doctoral or less | 22 | 13 |

## Exploratory Factor Analysis (EFA)

For evolving the dimensions of UBI principal component analysis was applied on sixteen variables of UBI revealing the five distinct dimensions out of the sixteen variables. The KMO value was found to be 0.798 that comes under the acceptable range i.e., more than 0.6 and also found to be significant (Table 2).

**Table 2**
**KMO AND BARTLETT'S TEST RESULT**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0.798 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2540.863 |
| | Df | 120 |
| | Sig. | 0.000 |

Communalities for all the sixteen variables were also found in acceptable range i.e., more than 0.5. The value of Cronbach's alpha for all the five dimensions is more than 0.7 that is quite good. Total variance explained (TVE) by these five dimensions is 80.478% (Table 3). In principal component matrix we avoid factor loadings less than 0.4. Table 3 reflects the clear cut five dimensions of UBI that may further impacts on E-impulse buying.

**Table 3**

**PRINCIPAL COMPONENT ANALYSIS RESULTS**

| Statements | Variables | Component | | | | | Communality |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | |
| For me planned buying is irritating. I just love to browse and buy immediately whatever I like | IBT1 | | 0.895 | | | | 0.820 |
| If I like something then I have to buy it right now | IBT2 | | 0.892 | | | | 0.833 |
| I always feel to shop online without any prior planning | IBT3 | | 0.887 | | | | 0.820 |
| When I see flash sales on internet I feel to buy products | PT1 | | | 0.864 | | | 0.814 |
| Flat rates on online products make me buy those products that are not in my shopping list | PT2 | | | 0.866 | | | 0.806 |
| Special vouchers provided on online sites create urges to buy items without any prior purchase intention | PT3 | | | 0.795 | | | 0.751 |
| Social media increases my urge to buy immediately from shopping websites | WC1 | | | | | 0.815 | 0.730 |
| Recommendations on internet influences me for unplanned buying | WC2 | | | | | 0.774 | 0.751 |
| I feel to buy product online due to a sudden urge after reading the reviews | WC3 | | | | | 0.795 | 0.708 |
| Website is safe and secure | WF1 | 0.763 | | | | | 0.721 |
| Website stick to their words whatever it is communicating to shoppers | WF2 | 0.943 | | | | | 0.926 |
| I have a satisfactory previous shopping experience on this website | WF3 | 0.948 | | | | | 0.933 |
| Return and refund policies of the website are transparent | WF4 | 0.931 | | | | | 0.903 |
| I am in a bad mood | SF1 | | | | 0.855 | | 0.830 |
| I have plenty of money to spend | SF2 | | | | 0.856 | | 0.790 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| I have sufficient time to browse and shop | SF3 | | | | 0.810 | | 0.740 |
| | Variance % | 21.497 | 15.957 | 14.673 | 14.521 | 13.831 | |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization | a. Rotation converged in 6 iterations. | | | | | | |

Therefore, we found five distinct dimensions of UBI website related factors (WF1, WF2, WF3 and WF4); situational factors (SF1, SF2 AND SF3); promotional tools (PT1, PT2 and PT3); website communication (WC1, WC2 and WC3); and impulse buying tendency (IBT1, IBT2 and IBT3) (Figure 2). Each dimension consists of three variables except website related factors that consists four variables. This scale for UBI with five distinct dimensions shows a comprehensive picture for capturing the impact of UBI on E-impulse buying.

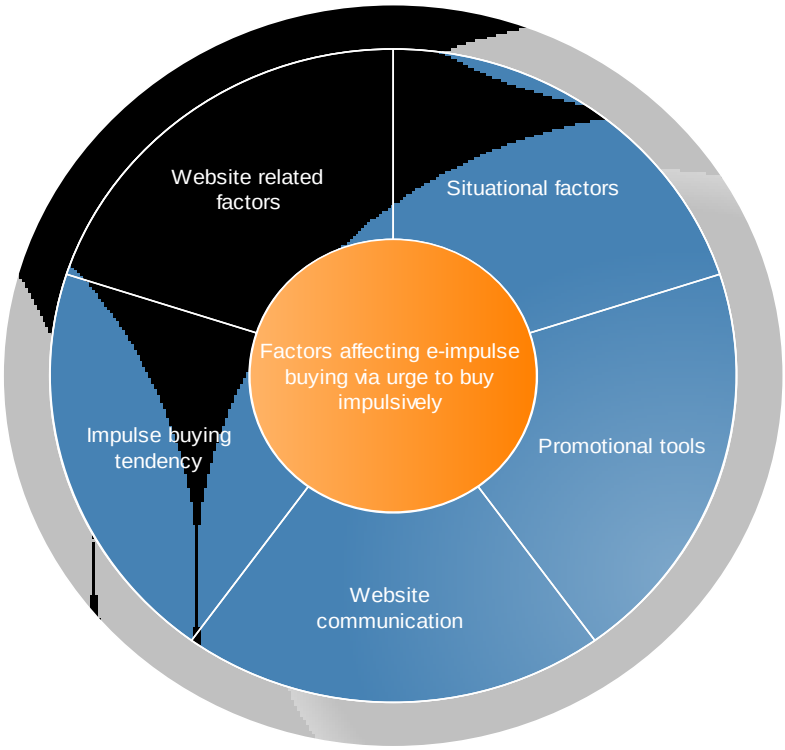


**FIGURE 2**
**FACTORS AFFECTING E-IMPULSE BUYING VIA URGE TO BUY IMPULSIVELY**

## Structural Equation Modelling (SEM)

Structural equation modelling was applied in this study to establish a comprehensive model for E-impulse buying. SEM is a multivariate technique that combines multiple regressions with confirmatory factor analysis to estimate simultaneously a series of interrelationship between the constructs of the hypothesized model. It basically consists of two models measurement model and structural model discussed later in details for this study.

## Measurement Model

Confirmatory factor analysis was used to assess the validity and reliability of the constructs in the model. To get the satisfactory viability of the model CFA was applied by using Amos 24. Literature suggested the positive relationship of the UBI with E-impulse buying hence the measurement model includes five dimensions of UBI evolved through EFA and E-impulse buying as the main constructs of the model (Figure 3).

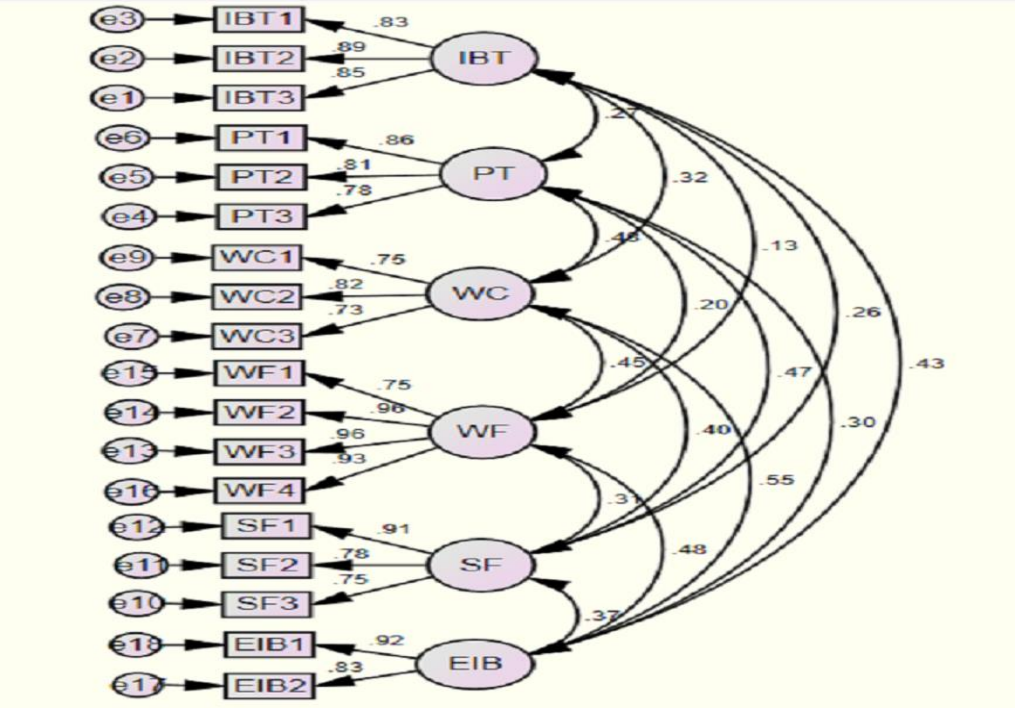


**FIGURE 3**
**MEASUREMENT MODEL**

The reliability, convergent and discriminant validity of the model was also evaluated (Table 4). Internal consistency was also evaluated by calculating the value of Cronbach's alpha for each construct. All the values of average variance explained (AVE) are more than 0.5 and less than the value of Cronbach's alpha. Maximum shared variance (MSV) and average shared variance (ASV) values are less than AVE. Thus we can conclude that discriminant validity of the model has been proved. Composite reliability (CR) is also evaluated to measure the reliability of a construct in the measurement model.

It offers a more retrospective approach of overall reliability and estimates consistency of the construct itself including the stability and equivalence of the construct (Hair, Anderson, Babin & Black, 2010). A value of 0.70 or greater is deemed to be indicative of good scale reliability (Fornell and Larcker, 1981; Nunnally and Bernstein, 1994).

**Table 4**
**RELIABILITY TEST**

| | Composite Reliability (CR) | Cronbach's alpha | Average Variance Explained (AVE) | Maximum Shared Variance (MSV) | Average Shared Variance (ASV) |
|---|---|---|---|---|---|
| **WF** | 0.947 | 0.892 | 0.817 | 0.226 | 0.115 |
| **IBT** | 0.894 | 0.943 | 0.737 | 0.184 | 0.089 |
| **PT** | 0.860 | 0.808 | 0.671 | 0.232 | 0.131 |
| **WC** | 0.810 | 0.852 | 0.587 | 0.303 | 0.201 |
| **SF** | 0.856 | 0.855 | 0.666 | 0.222 | 0.137 |
| **EIB** | 0.867 | 0.865 | 0.766 | 0.303 | 0.187 |

The entire model fit indices of the measurement model reflected satisfactory results. Comparative fit index (CFI) was 0.936; normed fit index was .899; goodness-of-fit index (GFI) was .882; and Tucker-Lewis Index (TLI) was .919. The root mean square error of approximation (RMSEA) was .082 that is less than 10% i.e., within the acceptable range (Table 5). CMIN/DF value was 2.501 i.e., less than 3 percent that shows an acceptable range i.e., less than 3. These values depicted that measurement model must be accepted as per the fit indices.

**Table 5**
**MODEL FIT INDICES OF THE MEASUREMENT MODEL**

| Model | CMIN/DF | CMIN | RMSEA | CFI | NFI | GFI | TLI |
|---|---|---|---|---|---|---|---|
| Five dimensions model | 2.501 | 300.062 | 0.082 | 0.936 | 0.899 | 0.882 | 0.919 |

## Invariance Test

To assess the effect of groups, invariance test was applied on the measurement model for four factors gender (male and female), income (high and low), marital status (married and unmarried) and internet usage (high and low). Chi-square difference values shown significant results and model fit indices for both constrained and unconstrained models were satisfactory hence it may conclude from the analysis that groups show satisfactory invariance results. Therefore it was indicated that all the groups of respective four factors were different. As these groups of factors were found to be variant therefore further the effects of these factors may be checked for the structural model.

## Structural Model

To check the hypothesized research model SEM was applied by using Amos 24. All the factor loadings for the constructs of the model are found to be significant. The factor loading of the relationship between UBI and E-impulse buying (EIB) was 0.72 that was found to be quite good and significant too (Figure 4). The structural model represented in Figure 2, shows satisfactory factor loading and results.

The model fit indices of the structural model were quite satisfactory. CMIN/DF value was 2.578 i.e., less than 3 comes under the acceptable range. RMSEA was found to be less than 10 percent i.e., 0.084. Other fitness indices CFI, GFI, NFI and TLI having values 0.928, 0.871, 0.888 and 0.941 respectively all values found to be satisfactory (Table 6). Therefore we can conclude from the analysis and results that as per the fitness indices values structural model is acceptable.

**Table 6**
**MODEL FIT INDICES OF THE STRUCTURAL MODEL**

| Model | CMIN/DF | CMIN | RMSEA | CFI | NFI | GFI | TLI |
|---|---|---|---|---|---|---|---|
| **Five dimensions model** | 2.578 | 332.596 | 0.084 | 0.928 | 0.888 | 0.871 | 0.914 |

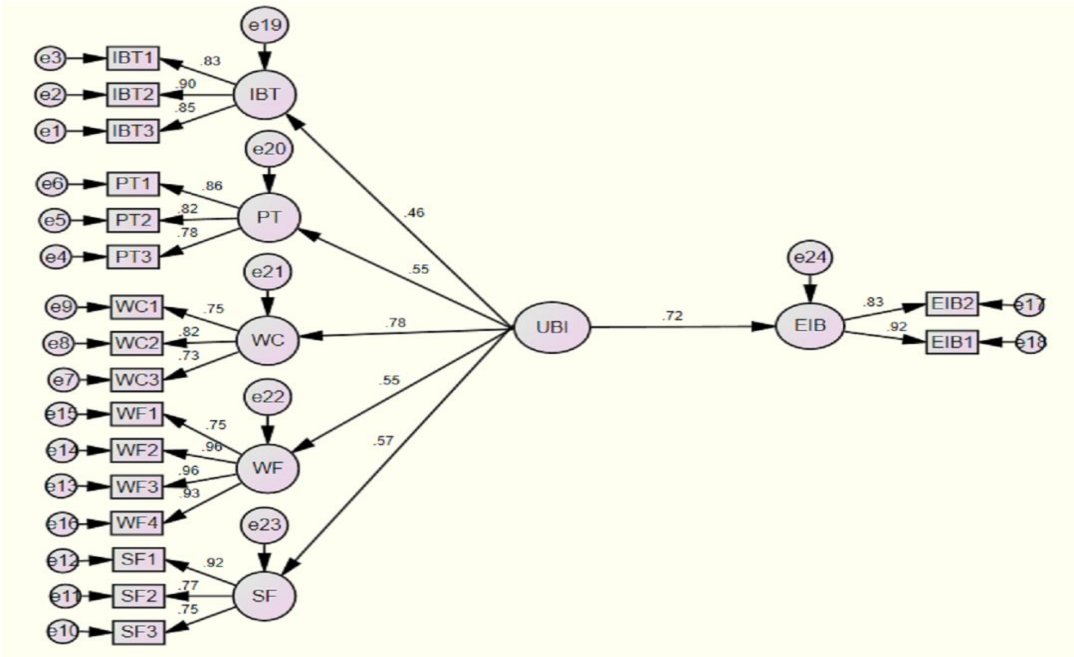


**FIGURE 4**
**STRUCTURAL MODEL**

## Moderation Effect

The moderation effect was checked for the different groups and it was found that all the groups for four factors show satisfactory results. Gender, income, marital status and internet usage moderates the relationship of UBI and E-impulse buying in the above

model. Male shoppers possess more impact than female shoppers over this model as estimates for both male and female respondents are found to be significant along with the significant z-score (Table 7). Similarly for other factors high income level, married shoppers and high usage of internet moderate the relationship of UBI and E-impulse buying more effectively rather than low income level, unmarried shoppers and low internet usage respectively (Tables 8-10).

**Table 7**
**MODERATION EFFECT OF GENDER ON THE MODEL**

| | | | **Female** | | **Male** | | |
|---|---|---|---|---|---|---|---|
| | | | Estimate | P | Estimate | P | z-score |
| EIB | <--- | UBI | 1.723 | 0.000 | 2.419 | 0.000 | 2.025** |

**Table 8**
**MODERATION EFFECT OF INCOME ON THE MODEL**

| | | | Low income | | High income | | |
|---|---|---|---|---|---|---|---|
| | | | Estimate | P | Estimate | P | z-score |
| EIB | <--- | UBI | 1.700 | 0.000 | 2.621 | 0.000 | 2.16** |

**Table 9**
**MODERATION EFFECT OF MARITAL STATUS ON THE MODEL**

| | | | Married | | Unmarried | | |
|---|---|---|---|---|---|---|---|
| | | | Estimate | P | Estimate | P | z-score |
| EIB | <--- | UBI | 2.040 | 0.000 | 1.667 | 0.000 | 2.05** |

**Table 10**
**MODERATION EFFECT OF INTERNET USAGE ON THE MODEL**

| | | | **Low internet usage** | | **High internet usage** | | |
|---|---|---|---|---|---|---|---|
| | | | Estimate | P | Estimate | P | z-score |
| EIB | <--- | UBI | 1.829 | 0.000 | 2.703 | 0.000 | 2.61** |

## DISCUSSION AND RECOMMENDATION

This study provides interesting insights through the comprehensive model for the E-impulse buying. First this model inhibits a five dimension scale for the urges to buy impulsively (UBI) that finally leads to E-impulse buying. E-tailers may focus over the comprehensive set of antecedents of UBI to increase or optimize the chances of E-impulse buying. They utilize this model by emphasizing over the antecedents of UBI to generate high sales revenue by creating more urges for E-impulse buying (Adelaar, Chang,

Lancendorfer, Lee & Morimoto, 2003). Secondly e-tailers also need to focus over the moderating impact of demographic factors as well as level of internet usage (Zhang, Prybutok & Strutton, 2007; Kollat and Willet, 1967; Sun and Wu, 2011; Jeffrey and Hodge, 2007). From this study it is found that male shopper exhibits higher level of impulsivity for shopping as compare to female shoppers (Zhang, Prybutok & Strutton, 2007) thus e-tailers require to modify their website practices gender wise. High income group of shoppers also have more affordability to convert their urges to buying impulsively into actual E-impulse buying thus e-tailers may customize their practices and features as per shoppers' income level (Jeffrey and Hodge, 2007). Shoppers who are married indulge more in impulse buying as compare to unmarried shoppers (Kollat and Willet, 1967). Thus e-tailers may utilize this model to create more urges for married shoppers. As same antecedents of UBI encountered by the married and unmarried shoppers but conversion into actual impulse purchase is higher in case of married shoppers. Sun and Wu in 2011 suggested that high internet users have the high probability of encountering urges to buy impulsively and hence the probability of actual E-impulse buying is more in the case of high internet users rather than low internet users. Thus e-tailers can modify their features and practices as per the inferences of this study to generate higher sales revenue along with higher customer satisfaction. Also this study fills the academic gap and thus academician and practitioners may utilize this study to better fill the knowledge gap of this concept.

## CONCLUSION, LIMITATION AND FURTHER DIRECTION OF RESEARCH

This study is able to understand the phenomenon of E-impulse buying with the virtue of comprehensive scale for the urge to buy impulsively. This study contributes in the prior studies by developing a model with comprehensive approach to capture E-impulse buying. Similar to the literature support this model also reveals significant positive relationship between UBI and E-impulse buying. This study may also provide insights regarding the moderating factors gender, income, marital status and internet usage on the relationship of UBI and E-impulse buying. Like male shopper possess high impulsivity than female shopper. Married shoppers are more intend to buy impulsively as compare to unmarried shoppers. High income group also indulge in more impulse buying rather than low income group. Internet users who indulge in activities on internet are more prone to feel urges to buy impulsively due to more chance of encountering urges to buy impulsively.

The limitations of this study exhibits the geographical and demographic sample constraints. As this study only reveals the inferences with respect to Indian online shoppers thus the generalization of the study may be checked for other countries or the sample size may be wide in terms of demography of the online shoppers across different nations. Culture as the affecting factor for the E-impulse buying is not taken in to consideration for this study. The effect of sub-cultures within India were not analysed therefore a cross-cultural study may be done in future within sub-cultures or within different cultures for digging out more inferences related to E-impulse buying. Some other extraneous factors may also be included in this model as moderating or mediating factors. And may be in future due to changing paradigms of online retailing more dimensions or variables may be added to the scale of UBI.

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