Routledge
Taylor & Francis Group

Economic Research-Ekonomska Istraživanja

ISSN: 1331-677X (Print) 1848-9664 (Online) Journal homepage: https://www.tandfonline.com/loi/rero20

Personality and impulsive buying behaviors. A necessary condition analysis

Asad Shahjehan & Javeria Andleeb Qureshi

To cite this article: Asad Shahjehan & Javeria Andleeb Qureshi (2019) Personality and impulsive buying behaviors. A necessary condition analysis, Economic Research-Ekonomska Istraživanja, 32:1, 1060-1072, DOI: 10.1080/1331677X.2019.1585268

To link to this article: https://doi.org/10.1080/1331677X.2019.1585268

Published online: 08 Jun 2019.

ECONOMIC RESEARCH-EKONOMSKA ISTRAŽIVANJA
2019, VOL. 32, NO. 1, 1060–1072
https://doi.org/10.1080/1331677X.2019.1585268

Personality and impulsive buying behaviors. A necessary condition analysis

Asad Shahjehan[a] and Javeria Andleeb Qureshi[b]

[a]Department of Management Sciences, Hazara University, Mansehra, Pakistan; [b]Department of Management Sciences, Hazara University, Mansehra, Pakistan

ABSTRACT

Personality traits sufficiently explain the tendency of an individual displaying impulsive buying behaviours. However, necessity notions of causality imply that the desired level of impulsive buying behaviours would not exist if the required personality traits were not present. To date, an appropriate analytical tool to assess necessary conditions has been lacking. This study applies a newly developed method 'Necessary Condition Analysis' on a sample of 640 university students (in February 2017) to evaluate the necessity of personality traits for displaying impulsive buying behaviours. Results show that for lower level impulsive buying behaviours an individual's conscientiousness is necessary, for medium level agreeableness, extraversion and openness become necessary conditions, while conscientiousness is a complementary necessary condition. Lastly, neuroticism is necessary for highest levels complemented by other personality traits. Application of NCA fundamentally changes our understanding regarding personality traits and impulsive buying behaviour relationship. Practically focusing on necessary conditions would be more effective than focusing on general predictors that only partially explain the outcomes.

ARTICLE HISTORY
Received 14 October 2017
Accepted 1 August 2018

KEYWORDS
Impulsive buying behaviours; big five personality traits; necessary condition analysis

1. Introduction

Research on the effects of personality traits on impulsive buying behaviours (IBB) is widely available (Badgaiyan & Verma, 2014; Shahjehan, Qureshi, Zeb, & Saifullah, 2012; Sun & Wu, 2011; Verplanken & Sato, 2011). In these studies, personality traits are predominantly viewed as enhancing, causing or driving IBBs (Muruganantham & Bhakat, 2013). The studies consider the notion of causality in terms of sufficiency, i.e. increase/decrease in the level of personality traits is sufficient to obtain a certain amount of rise/fall in the ability of customers in displaying IBB.

There is another distinct notation for causality that is concerned with intrinsically needed conditions. A certain or any level of IBB could not be attained when one or multiple personality traits are absent, i.e., no Y (IBBs) without X (personality traits).

CONTACT Asad Shahjehan asadshahjehan@hotmail.com

The sufficiency notation of causality focuses on an outcome being produced while the necessity notation allows the outcome to exist. Without the necessary causality, the outcome would not exist despite the presence of other factors.

Necessary conditions are often presented implicitly in the literature. We often come across statements such as 'X is critical for Y' or 'X is a precondition to Y': these statements can be referred as the alternate formulation of the Necessary condition. In the literature, we find similar statements regarding IBBS like Badgaiyan and Verma (2014) 'confirms the utility of' personality traits to comprehend IBBs. Likewise Saran, Roy, and Sethuraman (2016) 'validate' that consumer impulsive buying decisions are based on their personality traits and identities. The mentioned claims by Saran et al. (2016) and Badgaiyan and Verma (2014) can be interpreted as necessary condition statements positing that without one or more necessary personality traits there would be no IBBs.

The necessary condition statements are very widespread in marketing, operation management and organisational sciences (Autio, Dahlander, & Frederiksen, 2013; Diestre & Rajagopalan, 2011; Hausknecht, Hiller, & Vance, 2008; Kirca et al., 2011; Martin & Eisenhardt, 2010; Rubin, Munz, & Bommer, 2005). However, to date, the hypotheses based on the necessary condition could not be properly tested by traditional data analysis approaches, such as regression and correlations. The traditional techniques assume that X would sufficiently increase Y, but X is not necessary for Y as it can be increased with the addition of other factors also. Recently, to settle this debate between necessity and sufficiency a new analytical technique called Necessary condition analysis (NCA) has been developed by (Dul, 2016). The NCA enables the researchers to test Necessary condition hypotheses. It is a useful addition to the analytical tools currently prevailing in marketing, organisational and operational research as it advances our understanding of the causal relationships between predictor and outcome variables. It is currently applied in the field of creativity (Karwowski et al., 2016), operation management (Dul, Hak, Goertz, & Voss, 2010), mergers (Westerhuis, Dul, De Jong, & Hak, 2012), tourism and hospitality (Olya & Al-ansi, 2018) knowledge and data management (Dul, 2015), intelligence (Karwowski, Kaufman, Lebuda, Szumski, & Firkowska-Mankiewicz, 2017), trust (W van der Valk, Sumo, Dul, & Badenhorst, 2014), buyer-supplier relationships (Wendy van der Valk, Sumo, Dul, & Schroeder, 2016), manufacturing (Knol, Slomp, Schouteten, & Lauche, 2018) and firm market performance (Tho, 2016) with established marketing/managerial implications. This article applies NCA on a dataset collected for evaluating the relationship of the big five personality traits and impulsive buying, thus exploring its applicability and usefulness. The primary objective of this study is to explore the necessity of personality traits for the display of impulsive buying behaviours. The substantive research question that is addressed in this study is: whether any, some or all the personality traits are necessary for displays of impulsive buying behaviours?

2. Personality and impulsive buying behaviors

Personality is defined as 'a unique and dynamic organisation of characteristics of a particular person – physical and psychological – which influences behaviour and responses to the social and physical environment' (Badgaiyan & Verma, 2014, p.

538). Larsen and Buss (2008) describe personality as a set of organised and relatively enduring psychological traits within an individual. A marketer identifies personality as a construct that reflects consumer difference and based on its one or more traits, i.e., the consumer can be characterised into different groups. As personality is a consistent and enduring individual phenomenon, marketers know that they cannot change the personality of an individual, but can develop products that can be appealing to a target group of customers with inherent relevant traits.

Initially, the use of personality to understand and predict buying behaviours resulted in disappointments (Kassarjian, 1971); however, over time the interest in this phenomenon is increasing. The literature shows that Kollat and Willett (1967) were one of the first researchers to investigate the relationship between personality traits and impulsive buying behaviour. Cobb and Hoyer (1986) studied the same relationship; however, nothing significant was reported. Youn and Faber (2000) for the first time reported a positive and significant relationship between personality related construct 'lack of control' and impulsive buying behaviour. The study by Verplanken and Herabadi (2001) was instrumental in clarifying the relationship between IBBs and personality by categorically stating that the displays of IBBs are rooted in personality and there is considerable scope in studying IBBs with relation to personality traits. Their results also showed that conscientiousness and agreeableness decrease the display of IBBs. In contrast, neuroticism increases IBBs. Shahjehan et al. (2012) also reported that neuroticism would cause the display of IBBs. Bratko, Butkovic, and Bosnjak (2013) also report similar results by stating that female and individuals with neuroticism, extraversion, and impulsivity are more likely to display IBBs. It is worth mentioning that these studies have employed sufficiency notion of causality in their methodology, yet the statements presenting the relationship between personality traits and IBBs are assertive and forceful pointing towards the possible necessity of personality traits for the display of IBB.

In recent years, the trait-based approach for the quantitative measurement of personality has gathered more traction (Sofi & Najar, 2018). The most influential of these theories is the Big Five Personality Traits theory (Judge, Higgins, Thoresen, & Barrick, 1999; Myszkowski, Storme, & Tavani, 2018; Soldz & Vaillant, 1999). Researchers have constantly come across five-factor models for personality (Ellison, Rosenstein, Chelminski, Dalrymple, & Zimmerman, 2016; Liao & Chuang, 2004), yet they have consensus that the big-five model is most valid among all the personality trait taxonomies. The emergence and acceptance of big-five modelling has enabled the researchers to shift their focus of research to second level behaviour traits of personality, i.e., extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience. Doost, Mazaheri, and Talebi (2013) believe that big-five has the ability to characterise almost all the dimensions of the personality. Esfahani, Ghafari, Emami, and Baboli (2012) even indicate that the big-five model has the ability to provide information about genetic themes that are congenial. Given the wide acceptance of the big-five model, it is plausible that the five constructs of personality may act as necessary conditions for a different level of IBBs.

Most importantly, this article presents an additional logic and data analysis tool for a finer-grained understanding of the personality and IBBs phenomenon through

the lens of NCA thus making a valuable methodological contribution. NCA identifies necessary conditions, while traditional data analysis techniques like regression identify sufficiency conditions. Increasing the sufficiency condition as identified by regression would not increase the level of outcome, as the outcome cannot exist if the necessary conditions are unfulfilled. This enables NCA to have very strong managerial implications. The marketers and managers could not attain the desired outcomes unless they have placed every single condition at the optimum level required. Studies about necessary relationships are uncommon in general and not widespread in PTs and IBBs research. This article provides recommendations for the employment and interpretation of NCA.

3. Method

3.1. Research design

Dul (2016) is one of the pioneers in developing the NCA techniques. The NCA technique generates scatterplot between two variables X and Y with X being necessary for Y, to investigate the necessary condition between these variables. An empty upper left corner observed in the scatterplot suggests the presence of a necessary condition. Furthermore, the upper left section of the scatterplots is separated from the lower right section by ceiling lines. These lines identify the level of the necessary factor (X) required for any given level of outcome (Y). There are different techniques for drawing ceiling lines yet all these ceiling lines maximise the ceiling zone, i.e., the area above the ceiling line by assuming non-decreasing (piecewise) linear ceilings with limited or no observation in the ceiling zone. Some ceiling techniques do not allow any point above the ceiling line, hence are considered 100% accurate while other techniques allow some point or outliers above the ceiling line and are considered to have an accuracy less than 100%. Choosing the ceiling line based on its accuracy depends upon two factors: the ceiling zone and number of exceptions. A larger ceiling zone would lead to more observation above the ceiling line, which leads to lower accuracy. In contrast, a smaller ceiling zone leads to lesser observation above the ceiling line resulting in higher accuracy. The ceiling zone, ceiling lines, and accuracy are calculated by the NCA software.

The level of a necessary condition is evaluated by the level of effect size. In NCA effect size refers to the level of constraint the ceiling poses on the outcome. The effect size (d) is the size of the ceiling zone in relation to the total space, in which observations are empirically observed. The larger the ceiling zone, the larger would be the effect size. Dul (2016) presents a rule of thumb for evaluating the effect size, which is as follows: 0 to 0.1, small effect size, 0.1 to 0.3, medium effect size, 0.3 to 0.5 large effect size and greater than 0.5 very large effect size.

Effect size is a general measure displaying the level of constraint the constrainer X (personality traits) extends on the constrainee Y (IBBs). However, normally not all values of X constrain Y and for not all values of Y is Y constrained by X. NCA calls this phenomenon inefficiency and presents its two components 'condition inefficiency' and 'outcome inefficiency'. For this study, condition inefficiency specifies the level of personality traits not needed for even the highest level of IBBs, while outcome

inefficiency indicates that for a level of IBBs, any level of personality traits allows for a higher value of the IBBs. The inefficiencies are inversely proportional to effect size, i.e., the larger the inefficiencies the smaller would be the effect size. In the absence of both inefficiencies, the effect size would be 0.5. Furthermore, if any one of the inefficiencies is 100% this results in no ceiling and consequently no necessary condition and zero effect size. Lastly, the angle of the CR-FDH ceiling line also depends upon the condition and outcome inefficiencies. If both the inefficiencies are equal, the angle of the ceiling line would be 45 degrees. If the condition inefficiency is larger than the outcome inefficiency then the ceiling line would be steeper i.e., $>$ 45 degrees. In contrast, if the larger outcome inefficiency than condition inefficiency results in a ceiling line $<$ 45 degrees, i.e., less steep.

NCA would be employed to examine any novel insights about the role of personality in the display of IBBs by exploring which level of extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience are necessary for a certain desired level of IBB. The data for this exploratory study was collected in February 2017 from undergraduate and post-graduate students of business administration from a public-sector university of Pakistan. Research scholars have recommended questionnaire study when the nature of the study is exploratory, as it generates reasonable amounts of data, effectively collected through a research instrument (Åhlström & Westbrook, 1999). Similarly, bearing in mind the exploratory nature of the study, hypotheses are not tested or stated, though the study explores presumed relationships and evaluates them. A team of 20 postgraduate research students was trained to collect data from a population of 1140 undergraduate and post-graduate students studying business administration at a public-sector university of Pakistan. The respondents were selected through simple random sampling resulting in 640 valid responses: 48.2% of respondents were female, 95.5% had age less than 30 years and 77.8% respondents were from postgraduate programmes. The Descriptive characteristics of the sample are shown in Table 1.

4. Measures

***Impulsive buying behavior*:** A 20 item scale ($\alpha = 0.81$) developed by Verplanken and Herabadi (2001) was used to measure the tendency of IBBs of the respondents (e.g. 'If I buy something, I usually do it spontaneously') on a 7-point Likert scale ranging from 1" (Strongly Disagree) to "7" (Strongly Agree)

Big five personality traits: A modified version developed by (Sun, Wu, and Youn (2004)) was used to evaluate the personality of the respondents based on the big five personality traits. The instrument consists of 33 items having five items for 'Conscientiousness' ($\alpha = 0.82$) (e.g., 'Organised') and seven items each for 'Neuroticism' ($\alpha = 0.81$) (e.g., 'Moody more than others'), 'Agreeableness' ($\alpha = 0.81$) (e.g., 'Tenderhearted with others'), 'Extraversion' ($\alpha = .84$) (e.g., 'Talkative when with others') and 'Openness' ($\alpha = .82$) (e.g., 'More original than others'). The personality traits items asked the respondents how accurately they describe themselves on a 7-point Likert scale ranging from "1" (extremely accurate) to "7" (extremely inaccurate).

Table 1. Descriptive characteristics of the sample.

	N	%
Gender		
Female	274	42.8%
Male	366	57.2%
Age		
20-30	611	95.5%
30-40	23	3.6%
40-50	3	0.5%
50 and Above	3	0.5%
Education		
Undergraduate	142	22.2%
Postgraduate	498	77.8%

Table 2. Descriptive statistics of the variable scores.

	Scale Minimum	Empirical Minimum	Scale Maximum	Empirical Maximum	Mean	SD	1	2	3	4	5	6
Neuroticism	1	1.43	7	4.43	3.07	0.55	(0.81)					
Conscientiousness	1	1.40	7	4.40	3.16	0.50	0.25	(0.82)				
Agreeableness	1	1.57	7	4.43	3.06	0.44	0.18	0.21	(0.81)			
Extraversion	1	1.29	7	4.57	2.90	0.50	0.26	0.18	0.14	(0.84)		
openness	1	1.57	7	4.57	3.30	0.49	0.18	0.17	0.29	0.15	(0.82)	
Impulsive Buying	1	2.26	7	4.47	3.23	0.38	0.20	0.17	0.17	0.15	0.30	(0.81)

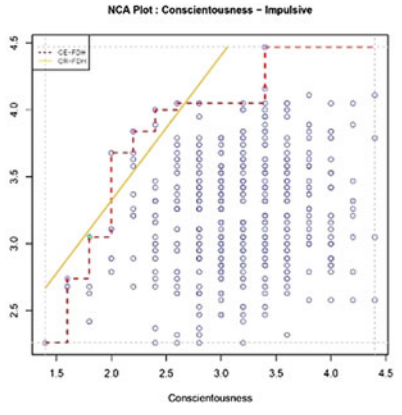
All Correlations significant at 0.01 level (2-tailed).
Values in () are Cronbach α value for each variable.

The measures are elaborated in Table 2 Descriptive statistics of the variable scores.

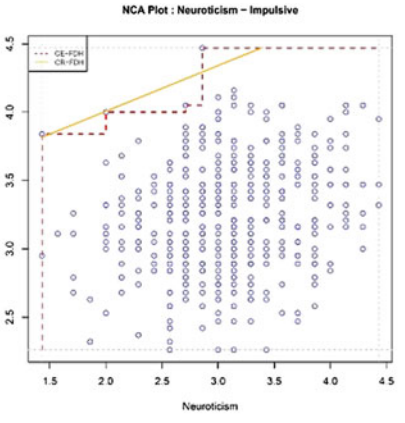
5. Results

In Figure 1 from A to E scatterplot for IBBs versus personality traits conscientiousness, neuroticism, agreeableness, extraversion, and openness are displayed. Fig 1A shows the scatterplot between IBBs and Conscientiousness. The plot suggests a possible presence of necessary condition as there is empty space in its upper left corner. Similar empty spaces are also noticed in the rest of of the scatterplots 1B, 1 C, 1 D and 1E, suggesting the possible presence of necessary condition between IBB and the respective personality traits. Two ceiling lines can be observed in all the scatterplots. The first ceiling envelopment technique used is CE-FDH, which is a non-decreasing step function through the upper-left data points, encompassing all the observations under its ceiling line. CE-FDH maximises the area above the ceiling line that is the ceiling zone by assuming a non-decreasing (piecewise) linear ceiling, which results in no observation in empty space in the upper right corner of the scatterplot. As the ceiling zone with CE-FDH is left empty the accuracy of this technique is 100%. Furthermore, as mentioned earlier, increase in accuracy results in a decrease in ceiling zones thus CE-FDH results in smaller ceiling zones. For data analysis and interpretation, this study would use CR-FDH. There are three main reasons: first, CR-FDH is based on CE-FDH thus it has fewer limitations than CE-FDH. Secondly, CR-FDH is the default technique for parametric data and lastly, this technique is less sensitive to outliers and measurement errors.

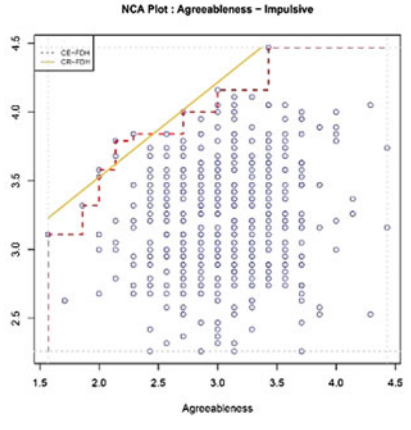
The first statistic that the NCA analysis generates is the accuracy. It is the number of observation/s above the ceiling line. For IBBs versus the personality traits, the



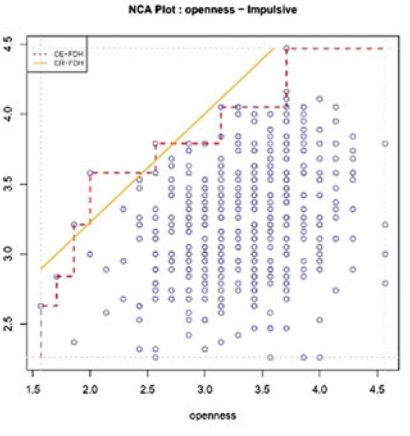
A. Scatterplot for Conscientiousness and IBBs



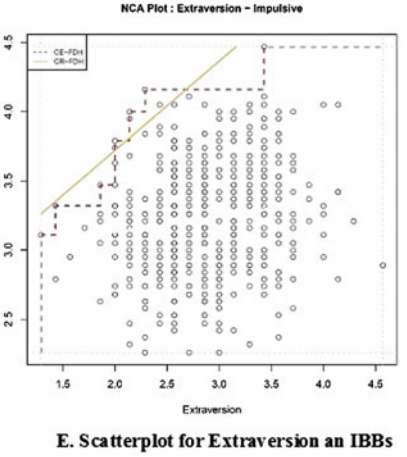
B. Scatterplot for Neuroticism and IBBs



C. Scatterplot for Agreeableness and IBBs



D. Scatterplot for Openness and IBBs



E. Scatterplot for Extraversion an IBBs

Figure 1. (A to E) scatterplot for IBBs versus personality traits.

Table 3. Results of necessary condition analyses.

Construct	Method	Accuracy	Ceiling Zone	Scope	Effect size (d)	Condition Inefficiency	Outcome Inefficiency
Neuroticism	CE – FDH	100	0.756	7	0.114	52.33%	71.49%
	CR – FDH	99.5	0.64	7	0.097	34.78%	70.39%
Conscientiousness	CE – FDH	100	1.786	7	0.269	33.33%	0.000%
	CR – FDH	98.6	1.492	7	0.225	44.73%	18.54%
Agreeableness	CE – FDH	100	1.316	6	0.208	34.96%	38.46%
	CR – FDH	99.2	1.117	6	0.177	37.03%	43.84%
Extraversion	CE – FDH	100	1.344	7	0.185	34.75%	38.46%
	CR – FDH	99.1	1.132	7	0.156	42.92%	45.28%
Openness	CE – FDH	100	1.813	7	0.273	28.66%	16.74%
	CR – FDH	99.5	1.603	7	0.242	32.29%	28.58%

accuracy ranges from 99.1 to 99.6 displaying high accuracy and illustrating the existence of necessary condition. Furthermore, the analyses generate ceiling zones, i.e. empty space at the top left corner of the scatterplot through a CR-FDH technique for each personality trait which ranges from 0.64 to 1.603. Following the ceiling zones, ceiling scopes are generated. Ceiling scope is the total area below the ceiling line where empirically observed responses are present. For neuroticism, conscientiousness, extraversion, and openness the scope calculated through the CR-FDH technique is 7 while for agreeableness it is 6. Based on the calculated CR-FDH ceiling zone and ceiling scope the effect size (level of constraint the ceiling poses on the outcome) is generated, which is the ceiling zone divided by the scope. Dul (2016) presents a rule of thumb for analysis of the magnitude of effect size. Based on th guideline, 0 to 0.1 is small effect, 0.1 to 0.3 is medium effect size, 0.3 to 0.5 is large effect size and > 0.5 is considered very large effect size. Unlike the traditional sufficiency notion in NCA, small effect sizes are highly meaningful as they still imply that a particular necessary condition must be present for the outcome to exist. Table 3 shows the results of the effect size of each personality trait on IBBs. Neuroticism ($d = 0.097$) has a small effect size while conscientiousness ($d = 0.225$), agreeableness ($d = 0.177$), extraversion ($d = 0.156$) and openness ($d = 0.242$) have medium effect size.

In table 3 both condition inefficiency and outcome inefficiency are reported for all the personality traits. The condition inefficiency of neuroticism is 34.78%, which means that a neuroticism level above 65.22% is not necessary for even the highest level of IBBs. Similarly, NCA also reports condition inefficiency for conscientiousness (44.7%), agreeableness (37.03%), extraversion (42.92%) and openness (32.29%) in table 3, meaning these personality traits at levels above 55.27%, 62.97%, 57.08%, and 67.71%, respectively, are not necessary for even the highest level of IBBs. The outcome inefficiency reported in table 3 for neuroticism is 70.39%. This means that, for a desired level of IBBs that is below 70.39% of 4.47 (the maximum observed level of IBBs) = 3.14, neuroticism is not a necessary condition for IBBs. With a similar procedure, outcome inefficiency has been calculated for a desired level of IBBs for conscientiousness (18.54%, 0.82), agreeableness (43.84%, 1.96), extraversion (45.28, 2.02) and openness (28.58, 1.27).

Lastly, in table 4, NCA produces a 'bottleneck table', which presents the level of threshold for the five personality traits that are separately necessary for attaining a certain desired level of IBBs. For this study, the desired IBBs level was divided into

Table 4. Bottleneck Levels (in%) using CR – FDH (NN = not necessary).

Impulsive Buying	Neuroticism NC from 70.39%	Conscientiousness NC from 18.54%	Agreeableness NC from 43.84%	Extraversion NC from 45.28%	Openness NC from 28.58%
0	NN	NN	NN	NN	NN
10	NN	NN	NN	NN	NN
20	NN	1	NN	NN	NN
30	NN	7.8	NN	NN	1.3
40	NN	14.6	NN	NN	10.8
50	NN	21.3	6.9	4.9	20.3
60	NN	28.1	18.1	15.3	29.8
70	NN	34.9	29.3	25.8	39.3
80	21.2	41.7	40.5	36.2	48.7
90	43.2	48.5	51.8	46.6	58.2
100	65.2	55.3	63	57.1	67.7

Notes:
––– The percentages listed refer to the percentage of the condition's range between the lowest and highest observed values in the dataset.
––– The dotted line indicates the boundaries between the three innovation ranges identified based on the distribution of the empirical innovation data.

three levels: low (0–25%), medium (25–75%) and high. For a display of low level of IBBs, only conscientiousness is necessary. The table shows that for 20% desired level of IBBs at least 1% conscientiousness is a necessary condition. At a medium level of IBBS agreeableness, extraversion and openness also become necessary for 30 to 75% desired level of IBBs along with conscientiousness. Finally, neuroticism is only necessary for the highest desired level of IBBs along with the other four personality traits.

6. Discussion

The literature regarding the effect of personality traits on consumer buying behaviours in general, and IBBs in particular, is exhaustive. However, no study was found that has tried to evaluate the necessity of these personality traits for IBBs. The studies point out the importance of several personality traits for IBBs in their theory formulation, hypothesis development, and discussion yet none could categorically state or prove the necessity for IBBs through traditional sufficiency based statistical tools. The emergence NCA as an analytical tool enables us to identify the necessary conditions for consumer buying behaviours. Necessary condition is 'a non-trivial characteristic, event, resource, or effort that is relatively unique, scarce, or costly and that must be designed, controlled, or managed to bring or keep it in place in order to allow a certain desired outcome to occur' (Dul, 2016, p. 36). It has key managerial relevance as it identifies the level of personality traits without which there is guaranteed failure in displaying certain level of IBBs, and this level cannot be compensated for by its other determinants. Furthermore, NCA might be stronger and more relevant for marketers and managers in making practical decisions regarding personality based consumer behaviour than that of a traditional analysis.

This study adds to the impulsive buying literature as it for the first time reveals that all the big five personality traits are necessary for different levels of IBBs. Specifically, for the display of lower levels of IBBs, an individual's conscientiousness towards the buying process is necessary. For medium level agreeableness, extraversion and openness become necessary conditions while conscientiousness complements

rather than substitutes since for achieving this level of IBBs requires the presence of all these four personality traits in an individual. Lastly, neuroticism is the only personality trait that is necessary for the highest level of IBBs and similarly is being complemented by the other four. If any of these thresholds are not met, the level of IBBs would be lower, even if the other thresholds are met or even exceeded. NCA provides us with new insights into the understanding of the combined roles of PTs, as all of them are necessary at different levels for achieving a different level of the IBBs. The findings of this study also suggest a unique interpretation of complementarity. For a lower level of IBBs, only the presence of conscientiousness is required in an individual's personality. However, conscientiousness becomes a complementary trait specifically for the medium level and conscientiousness, agreeableness, extraversion, and openness specifically for the higher level. Based on its findings this study provides two main insights from a marketer and managerial perspective. First, the study provides insights into which personality characteristics are necessary for identifying the tendency of an impulsive buyer. Secondly, the study provides a threshold for type and level of personality traits necessary for the desired level of IBBs.

Using the necessity notion of causality, these unique theoretical and practical insights are obtained through the application of NCA. This technique facilitates us in parsimonious necessity based theoretical modelling which includes only variables of direct interest. Straightforward testing evaluates binary relationships between the variables through scatterplots and combined relationships through the bottleneck table. Most importantly, this approach would enhance the literature by providing new findings in the field of burying behaviours in general and the topic of this study specifically, as studies based on this topic are solely based on the sufficiency notion of causality. Lastly, the study further enriches the existing necessity based body of knowledge as studying necessity enables us to identify the predictor variable/s necessary for the outcome, and if the predictor is not present at a specific level the outcome would cease to exist. For marketers, managers and leaders, focusing on necessary conditions would be more effective than focusing on general predictors that partially explain the outcomes.

Like any study, this study also has certain limitations. The first limitation is the scope of the sample, as it has been drawn from a specific set of consumers, i.e., students of a university, due to which wider generalisation cannot be claimed. However, the current sample was used to demonstrate how NCA can be used to satisfy the needs for necessity based theoretical modelling; replication of this study using different samples is needed for improved generalisability. Secondly, NCA has its own limitations. As NCA is a new technique, it has not addressed all issues regarding statistical and causal inference, e.g., so far NCA could not provide significance of its effect size. Furthermore, like other analytical techniques, NCA also presumes the data is valid and reliable, which makes it vulnerable to measurement error. For this study, we have conducted both exploratory and confirmatory factor analysis to evaluate the reliability and validity of the model. However, caution is still needed when drawing causal conclusions.

The study provides the following recommendations for future studies. First, future studies could evaluate the necessity of big-five personality traits for buying behaviours

like compulsive buying and recreational buying. Secondly, these models could be tested through structural equation modelling complementary to NCA, to effectively display the relationship between personality traits and buying behaviours. Thirdly, a comparative study employing the necessity methodology could be conducted to measure whether significant differences exist among different cultures. Fourthly, this study could be replicated in multiple samples, for example workers, to better understand the dynamics of the relationship between personality traits and buying behaviours. Lastly, future research could use the NCA view of necessity thinking to focus their resources more efficiently and generate the desired responses from its customers, better assess, manage and communicate critical risk factors involved in purchase and consumption of consumer goods (Kułyk, Michałowska, & Patelska, 2017), discover which routines are crucial for different implementation stages of marketing practices and finally ensuring the right level of necessary conditions for product innovation and development, giving rather more attention to other factors that on average improve these processes.

References

Åhlström, P., & Westbrook, R. (1999). Implications of mass customization for operations management: an exploratory survey. *International Journal of Operations & Production Management*, *19*(3), 262–275. doi:10.1108/01443579910249705

Autio, E., Dahlander, L., & Frederiksen, L. (2013). Information exposure, opportunity evaluation, and entrepreneurial action: An investigation of an online user community. *Academy of Management Journal*, *56*(5), 1348–1371. doi:10.5465/amj.2010.0328

Badgaiyan, A. J., & Verma, A. (2014). Intrinsic factors affecting impulsive buying behaviour—Evidence from India. *Journal of Retailing and Consumer Services*, *21*(4), 537–549. doi:10.1016/j.jretconser.2014.04.003

Bratko, D., Butkovic, A., & Bosnjak, M. (2013). Twin study of impulsive buying and its overlap with personality. *Journal of Individual Differences*, *34*(1), 8–14. doi:10.1027/1614-0001/a000091

Cobb, C. J., & Hoyer, W. D. (1986). Planned versus impulse purchase behavior. *Journal of Retailing*, *62*, 67–81.

Diestre, L., & Rajagopalan, N. (2011). An environmental perspective on diversification: The effects of chemical relatedness and regulatory sanctions. *Academy of Management Journal*, *54*(1), 97–115.

Doost, H. T. N., Mazaheri, M. A., & Talebi, H. (2013). The relationship between personality characteristics and parenting styles with video-computer plays' dependency. *Journal of Social Sciences (COES&RJ-JSS)*, *2*(4), 207–214.

Dul, J. (2015). Necessary Condition Analysis: more value from data. *RSM Discovery-Management Knowledge*, *23*(3), 8–11.

Dul, J. (2016). Necessary condition analysis (NCA) logic and methodology of "Necessary but Not Sufficient" causality. *Organizational Research Methods*, *19*(1), 10–52. doi:10.1177/1094428115584005

Dul, J., Hak, T., Goertz, G., & Voss, C. (2010). Necessary condition hypotheses in operations management. *International Journal of Operations & Production Management*, *30*(11), 1170–1190. doi:10.1108/01443571011087378

Ellison, W. D., Rosenstein, L., Chelminski, I., Dalrymple, K., & Zimmerman, M. (2016). The clinical significance of single features of borderline personality disorder: anger, affective instability, impulsivity, and chronic emptiness in psychiatric outpatients. *Journal of Personality Disorders*, *30*(2), 261–270. doi:10.1521/pedi_2015_29_193

Esfahani, A., Ghafari, M., Emami, A., & Baboli, A. (2012). Studying impacts of personality traits on creativity (Case study: University of Isfahan's students). *Journal of Basic and Applied Scientific Research*, *2*(4), 3457–3460.

Hausknecht, J. P., Hiller, N. J., & Vance, R. J. (2008). Work-unit absenteeism: Effects of satisfaction, commitment, labor market conditions, and time. *Academy of Management Journal*, *51*(6), 1223–1245. doi:10.5465/amj.2008.35733022

Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The big five personality traits, general mental ability, and career success across the life span. *Personnel Psychology*, *52*(3), 621–652. doi:10.1111/j.1744-6570.1999.tb00174.x

Karwowski, M., Dul, J., Gralewski, J., Jauk, E., Jankowska, D. M., Gajda, A., … Benedek, M. (2016). Is creativity without intelligence possible? A necessary condition analysis. *Intelligence*, *57*, 105–117. doi:10.1016/j.intell.2016.04.006

Karwowski, M., Kaufman, J. C., Lebuda, I., Szumski, G., & Firkowska-Mankiewicz, A. (2017). Intelligence in childhood and creative achievements in middle-age: The necessary condition approach. *Intelligence*, *64*, 36–44. doi:10.1016/j.intell.2017.07.001

Kassarjian, H. H. (1971). Personality and consumer behavior: A review. *Journal of Marketing Research*, *8*(4), 409–418. doi:10.1177/002224377100800401

Kirca, A. H., Hult, G. T. M., Roth, K., Cavusgil, S. T., Perryy, M. Z., Akdeniz, M. B., … White, R. C. (2011). Firm-specific assets, multinationality, and financial performance: A meta-analytic review and theoretical integration. *Academy of Management Journal*, *54*(1), 47–72. doi:10.5465/amj.2011.59215090

Knol, W. H., Slomp, J., Schouteten, R. L., & Lauche, K. (2018). Implementing lean practices in manufacturing SMEs: testing 'critical success factors' using Necessary Condition Analysis. *International Journal of Production Research*, *48*(5), 1–19.

Kollat, D. T., & Willett, R. P. (1967). Customer impulse purchasing behavior. *Journal of Marketing Research*, *4*(1), 21–31. doi:10.2307/3150160

Kułyk, P., Michałowska, M., & Patelska, M. (2017). Consumer attitudes in the light of the concept of sustainable consumption in Lubuskie voivodeship against the background of trends in consumption in Poland. *Oeconomia Copernicana*, *8*(2), 181–198. doi:10.24136/oc.v8i2.12

Larsen, R. J., & Buss, D. M. (2008). Personality psychology. *Jastrebarsko: Naklada Slap*, *20*(2), 269–271.

Liao, H., & Chuang, A. (2004). A multilevel investigation of factors influencing employee service performance and customer outcomes. *Academy of Management Journal*, *47*(1), 41–58. doi:10.2307/20159559

Martin, J. A., & Eisenhardt, K. M. (2010). Rewiring: Cross-business-unit collaborations in multibusiness organizations. *Academy of Management Journal*, *53*(2), 265–301. doi:10.5465/amj.2010.49388795

Muruganantham, G., & Bhakat, R. S. (2013). A review of impulse buying behavior. *International Journal of Marketing Studies*, *5*(3), 149.

Myszkowski, N., Storme, M., & Tavani, J. L. (2018). Are reflective models appropriate for very short scales? Proofs of concept of formative models using the ten-item personality inventory. *Journal of Personality*, *47*(1), 41–58. doi:10.1111/jopy.12395

Olya, H. G., & Al-Ansi, A. (2018). Risk assessment of halal products and services: Implication for tourism industry. *Tourism Management*, *65*, 279–291. doi:10.1016/j.tourman.2017.10.015

Rubin, R. S., Munz, D. C., & Bommer, W. H. (2005). Leading from within: The effects of emotion recognition and personality on transformational leadership behavior. *Academy of Management Journal*, *48*(5), 845–858. doi:10.5465/amj.2005.18803926

Saran, R., Roy, S., & Sethuraman, R. (2016). Personality and fashion consumption: a conceptual framework in the Indian context. *Journal of Fashion Marketing and Management: An International Journal*, *20*(2), 157–176. doi:10.1108/JFMM-04-2015-0032

Shahjehan, A., Qureshi, J. A., Zeb, F., & Saifullah, K. (2012). The effect of personality on impulsive and compulsive buying behaviors. *African Journal of Business Management*, *6*(6), 2187–2194.

Sofi, S. A., & Najar, S. A. (2018). Impact of personality influencers on psychological paradigms: An empirical-discourse of big five framework and impulsive buying behaviour. *European Research on Management and Business Economics*, *24*(2), 71–81. doi:10.1016/j.iedeen.2017.12.002

Soldz, S., & Vaillant, G. E. (1999). The Big Five personality traits and the life course: A 45-year longitudinal study. *Journal of Research in Personality*, *33*(2), 208–232. doi:10.1006/jrpe.1999.2243

Sun, T., & Wu, G. (2011). Trait predictors of online impulsive buying tendency: A hierarchical approach. *Journal of Marketing Theory and Practice*, *19*(3), 337–346. doi:10.2753/MTP1069-6679190307

Sun, T., Wu, G., & Youn, S. (2004). *Psychological antecedents of impulsive and compulsive buying: A hierarchical perspective*. Paper presented at the The proceedings of the society for consumer psychology 2004 winter conference.

Tho, N. D. (2016). *Necessary capabilities for firm performance: an NCA approach*. Paper presented at the Proceedings of ICUEH2016: International conference of University of Economic Ho Chi Minh City: Policies and sustainable economic development, HCMC, Vietnam, November 11, 2016.

van der Valk, W., Sumo, R., Dul, J., & Badenhorst, H. (2014). How contracts and trust influence innovation in inter-organizational relationships: A necessary condition analysis.

van der Valk, W., Sumo, R., Dul, J., & Schroeder, R. G. (2016). When are contracts and trust necessary for innovation in buyer-supplier relationships? A Necessary Condition Analysis. *Journal of Purchasing and Supply Management*, *22*(4), 266–277. doi:10.1016/j.pursup.2016.06.005

Verplanken, B., & Herabadi, A. (2001). Individual differences in impulse buying tendency: Feeling and no thinking. *European Journal of Personality*, *15*(S1), S71–S83. doi:10.1002/per.423

Verplanken, B., & Sato, A. (2011). The psychology of impulse buying: An integrative self-regulation approach. *Journal of Consumer Policy*, *34*(2), 197–210. doi:10.1007/s10603-011-9158-5

Westerhuis, G., Dul, J., De Jong, A., & Hak, T. (2012). *Success in bank mergers. An application of Necessary Condition Analysis (NCA) in business history*. Paper presented at the Annual Conference of the European Business History Association Congress.

Youn, S., & Faber, R. J. (2000). *Impulse buying: its relation to personality traits and cues*. Paper presented at the NA - Advances in Consumer Research, Provo, UT.