Application of the Theory of Planned Behaviour to Predict College Students' Online Purchase Intention : A Systematic Review and Meta-Analysis

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Abstract

The main aim of this study was to review and synthesize the literature on the theory of planned behavior (TPB) tested empirically by researchers worldwide to predict college students' online purchase intention using its antecedents. This article meta-analyzed the correlations between the three independent constructs of TPB: attitude, subjective norms, perceived behavioral control, and one dependent construct, purchase intention. The researchers reviewed 1,798 articles generated through seven electronic database searches for the period from 2003 – 2020. These studies were screened against the inclusion-exclusion criteria using PRISMA, leaving 15 study records for performing a systematic review and meta-analysis. The findings confirmed a strong relationship between attitude and purchase intention, subjective norms and purchase intention, and perceived behavioral control and purchase intention. This indicated that the TPB constructs significantly predicted the online purchase intention of college students.

Keywords : **meta-analysis, online shopping, purchase intention, systematic review, theory of planned behavior**

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The internet is a global medium increasingly gaining focus and attractiveness as the most revolutionary marketing tool (Thakur et al., 2017). The use of the internet today is no longer restricted to a networking medium, but it is also used as a means of transaction for global consumers (Delafrooz et al., 2011). The technological progress in the past few decades has made effective improvements in global communication (Giri et al., 2018). The internet has created countless opportunities in different business sectors (Mohamed et al., 2018). The remarkable growth of e-commerce has made rapid strides due to increasing internet connectivity, better technology, a growing young population, and greater access to smartphones and other mobile devices (Kurup & Jain, 2018). Over the past few years, people's obsession with mobile phones has also been on the rise (Agarwal et

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al., 2019). Nowadays, one can easily sell and buy a product from any place and at any time through the internet and mobile phone. This business mode is known as "online shopping" (Jain & Kulhar, 2019).

Online shopping is the process of buying goods and services directly from a merchant over the internet. Online shoppers visit web stores and shop using computers or smartphones from the comfort of their homes (Zuroni & Goh, 2012). With online shopping, marketers can promote their merchandise in a wide geographical area (Thakur et al., 2017). The first secure online retail transaction occurred in 1994. Immediately after that, in 1995, Amazon.com launched its online shopping website, and eBay was also launched in the USA in 1995. Online shopping is almost 20 years old in developed countries, but due to several impediments, it is in an emerging phase in developing countries (Jain & Kulhar, 2019).

Over the period, internet penetration has improved at a fast pace in both developed and developing countries around the world. As per Internet World Statistics (2014), the number of internet users surpassed 2.41 billion by 2012. This figure was around 34.3 % of the world's total population (Al-Debei et al., 2015). By 2016, 88.5% of the USA's population had access to the internet. The figures for internet penetration recorded in a few developing countries are India (34.8%), Iran (48.9%), Thailand (42.7%), Egypt (33%), Sri Lanka (29.3%), and China (52.2%). Due to internet penetration, global consumers can have access to a wide range of goods and services offered by e-tailers (Jain & Kulhar, 2019). By 2016, 1.6 billion people across the globe had bought goods worth 1.90 trillion US dollars through online shopping (Rehman et al., 2019).

The Research Problem

The use of the internet for online purchases has become popular among the younger generation because of its ease of use and convenience (Yakasai & Jusoh, 2015). According to Lim et al. (2016), young customers have great buying potential, and they also spend much of their time online. The younger generation finds online shopping more convenient. The ease and convenience of shopping over the internet make 'online shopping' popular, especially among Gen Y customers. By 2026, almost 40% of all the goods worldwide will be sold online (Barska & Wojciechowska-Solis, 2020). Indeed, online shopping has emerged as one of the most significant fields of e-commerce with the growing cost-effectiveness of communication technologies (Chau et al., 2000). With this backdrop, it becomes imperative to study the behavior of these young online shoppers across the globe.

This research study is conducted with two primary objectives. First, this article aims to systematically review and synthesize the literature on the theory of planned behavior (TPB) tested empirically by researchers worldwide to predict college students' online purchase intention. Second, this article strives to meta-analyze the correlations between the three independent constructs of the TPB, that is, attitude, subjective norms, perceived behavioral control, and one dependent construct, online purchase intention.

Importance of the Study

This study provides two primary contributions to the available literature on TPB. First, by comprehensively reviewing the literature over the past 18 years, that is, from 2003 – 2020, we synthesized the findings of 15 separate studies. Second, we performed a meta-analysis to examine the most salient antecedents of college students' online purchase intention. Online retailers may get some valuable insights into the factors affecting their young customers by referring to the results of this study.

The Research Gap and Rationale of the Study

While surveying the previously published literature, the researchers didn't find meta-analytic studies attempting to

predict college students' online purchase intention using the TPB. Moreover, according to experts, by 2026, nearly 40% of all products globally will be sold online (Linge et al., 2021). According to Sharma et al. (2020), youngsters play an enormous role in digital marketing as they are the ones who have grown up with technology. Considering this, we strived to determine college students' online purchase intention.

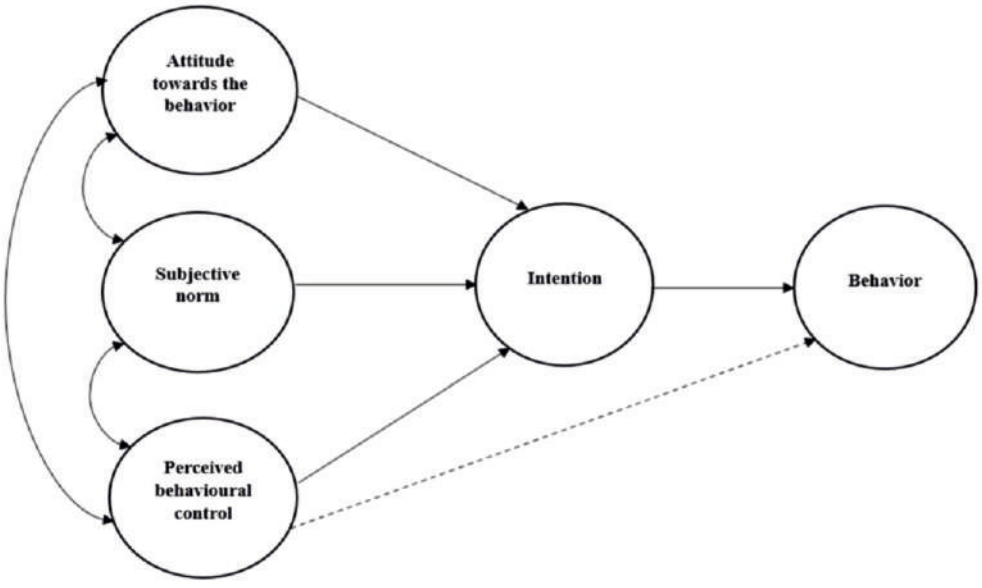
Review of Literature

Theory of Planned Behavior (TPB)

Martin Fishbein developed the theory of reasoned action (TRA) in the late 1960s. It was further extended in 1980 by Fishbein and Icek Ajzen as TPB (Arora & Aggarwal, 2018). TPB states that, like TRA, behavioral intention is a function of attitude and subjective norms. One more variable, 'perceived behavioral control (PBC),' was added to TPB to predict behavioral intention (Figure 1) (Turan, 2012). TPB is one of the most commonly used models to describe and predict an individual's purchase intentions. TPB proposed that PBC and intention define an individual's behavior. Moreover, the intention is determined by attitude, subjective norms, and PBC (Hsu et al., 2006).

Many studies have evaluated the relationships among these three variables and agreed that they are valid in explaining consumers' online purchase intentions across the globe. TPB has been studied to predict online shopping intention in developed countries, but little evidence is found in developing countries (Al-Jabari et al., 2012). It was very well established by Shim et al. (2001) that consumers experience difficulties while shopping online. Therefore, PBC should be considered when evaluating the customers' online purchasing behavior since a certain degree of ability and resources are needed for online shopping. Another reason that makes TPB appropriate to explore online shopping behavior is that shoppers can face problems while shopping online, which will call for the use of their knowledge and experience to shape beliefs about the associated attributes. This will help create an overall attitude toward online shopping (Raman, 2020).

Figure 1. ***Theory of Planned Behavior***



Source : Ajzen (1991).

Based on the TPB model presented in Figure 1, we examine the degree to which attitude, subjective norms, and PBC help to predict college students' online purchase intentions.

Attitude

The attitude construct received its first serious attention from Darwin in 1872. Darwin defined attitude as the physical expression of an emotion (Oly Ndubisi & Sinti, 2006, p.2). Attitude can be defined as the individual's positive or negative feelings about performing a behavior (Ajzen, 1985). It also refers to the global predisposition (for or against) to acquire certain behavior (Crespo & Rodríguez del Bosque, 2008).

Subjective Norms

Subjective norms (SN) can be characterized as other people's social pressure on a person to perform a particular behavior (Ajzen & Fishbein, 1975; Chang, 1998). SN represents the individuals' referents, including their family and friends (Raman, 2020; Venkatesan et al., 2004).

Perceived Behavioural Control

Perceived behavioral control (PBC) is the degree of intentness of an individual as to how willing or reluctant he/she is to perform a behavior. Factors like time, financial capabilities, expertise, proficiency, and support of other individuals affect a person's volitional control (Ajzen & Madden, 1986; Raman, 2020). PBC is an individual's degree of intent is how eager or unwilling he/she is to perform a behavior. It represents an individual's belief in the availability of resources or lack of opportunities necessary to perform a behavior (Ajzen, 1985; Cheng & Huang, 2013).

Purchase Intention

Purchase intention is the consumer's likelihood of purchasing goods. The greater the probability, the stronger the purchase intention (Lee et al., 2017). Purchase intention also refers to an individual's probability of behaving in a certain way, and it is a function of attitude, SN, and PBC (Cheng & Huang, 2013; Heirman et al., 2013).

Research Questions

This research strives to address the below-mentioned research questions:

- ***RQ1.*** Does attitude significantly impact the online purchase intentions of college students?
- ***RQ2.*** Do subjective norms significantly impact the online purchase intentions of college students?
- ***RQ3.*** Does perceived behavioral control significantly impact the online purchase intention of college students?

Methodology

As discussed above, we systematically reviewed and meta-analyzed the correlations between TPB's three independent and one dependent variable. This section explains the study design. It explains the type of research, the sample framework, the analysis intended, the software used, the study period, the details about the samples, and the hypothesis formulated for the study.

Literature Search Strategy

We followed a two-step process to identify the published articles which empirically investigated the relationship between college students' online purchase intention and its three antecedents in TPB. First, the articles were searched until December 20, 2020, in seven electronic databases: Scopus, Web of Science (WoS), Springer, Emerald, J-Gate, JStor, and Google Scholar. We searched the following Boolean keywords in the electronic searches: ("theory of planned behavio*" or "purchase intention"), ("online shopping" or "online purchase" or "e-commerce" or "online buying" or "e-shopping"). The papers published from 2003 to 2020 were searched. The search results generated 421 papers in Scopus, 225 articles in WoS, 288 articles in Springer, 292 articles in J-Gate, 233 articles in JStor, 171 articles in Emerald, and 170 articles in Google Scholar. The electronic search generated a total of 1,798 articles. Second, we removed 196 duplicate articles. By using the below-mentioned inclusion-exclusion criteria, we subsequently screened the remaining 1,602 articles.

Inclusion and Exclusion Criteria

To perform the meta-analysis, we carefully selected the studies by following the strict inclusion and exclusion criteria mentioned below :

- We eliminated those articles written in languages other than English.
- The studies measuring purchase intention using the "theory of planned behavior" were included.
- The studies had to empirically report the direct measurement of attitude, SN, PBC, and purchase intention. This leads to the exclusion of exploratory studies, book chapters, review articles, and studies based on SLR and meta-analysis.
- We included those articles in which the bi-variate statistical relationship between the constructs in TPB was retrievable. Articles reporting at least one bi-variate correlation between the three antecedents and purchase intention in TPB were included.
- The articles had to report the online shopping behavior of college students toward purchasing goods and services.

Selection of Studies

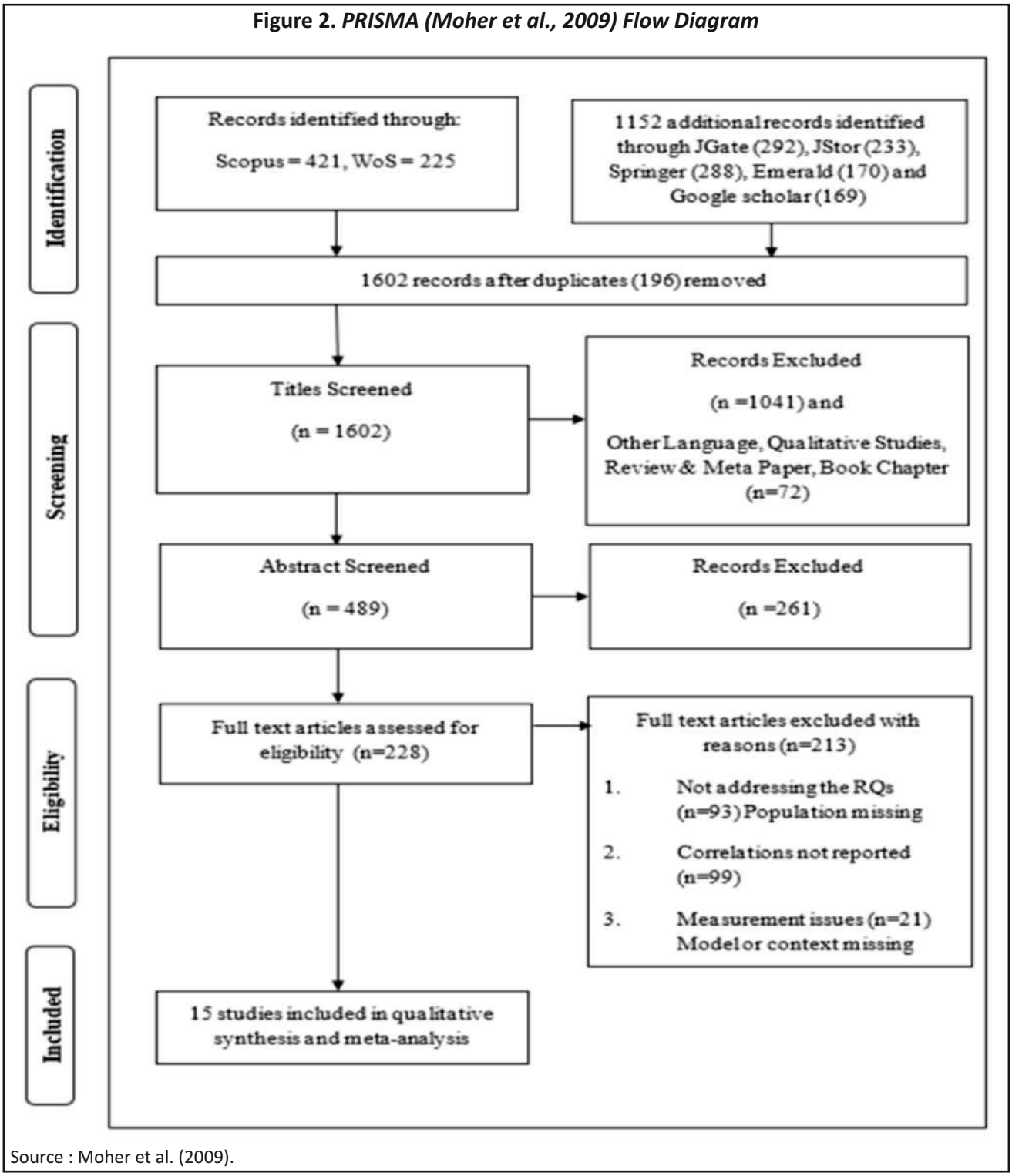
A total of 1,602 titles were reviewed by us to check their relevance to the research questions, and 1,041 papers were excluded at this stage. Other 72 papers not meeting the inclusion criteria (Figure 2) were also excluded. The remaining 489 papers were screened to check the relevance of their abstracts and 261 articles were excluded at this stage. The remaining 228 full-length eligible papers were then evaluated, and 213 papers were excluded for the below-mentioned reasons :

- In 21 papers, there was a measurement issue. These articles did not use TPB.
- Ninety-three articles were excluded because they were irrelevant to the research questions. The target population of 'college students' was not studied in these papers.
- Ninety-nine papers were excluded because no correlation coefficients between TPB's three independent variables, such as "attitude, SN, and PBC" with "purchase intention" were reported.

Finally, the remaining 15 full-text articles were included in the systematic review and meta-analysis after

applying the exclusion criteria. The preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow diagram describing the screening and eligibility process used by us is presented in Figure 2.

Figure 2. ***PRISMA (Moher et al., 2009) Flow Diagram***



Source : Moher et al. (2009).

Data Extraction for Meta-Analysis

The data were extracted from the finally selected 15 papers for performing a meta-analysis. We once again reviewed all the selected articles to the fullest extent to resolve differences in data extraction following vigorous discussions. The correlation coefficient values of the chosen dependent and independent variables and their respective sample sizes were extracted. As mentioned above, some studies assessed the relationship between all the constructs in TPB, while a few assessed the relationship between only a few selected variables. As a result, the number of correlation coefficients for the three independent variables, that is, attitude, SN, and PBC with purchase intention, are different. While extracting data, it was found that one study (Nadlifatin et al., 2020) reported two correlation coefficients for two different samples of college students belonging to two different countries. Both the *'r'* values are independently included in the meta-analysis. Therefore, meta-analysis was performed on 16 correlation coefficients. In addition to the correlation coefficient values and sample sizes, the demographic details of the target population, country, year of publication, names of the journals and respective databases, year of publication, and citations to the articles were also extracted and recorded. This information is summarized in Table 1. Subsequently, the following null hypothesis is formulated for further testing using meta-analysis.

↳ **H0 :** There is no difference in the effect sizes of all the studies included in the meta-analysis.

Meta-Analytic Procedure

This meta-analysis is reported by using the (PRISMA) statement (Moher et al., 2009). The correlation coefficient between TPB variables is used as the index of effect size for this meta-analysis. Fisher *z* - transformation is used to transform these correlations, with weights derived from the sample size of each article. Jamovi (version 1.2.25) computer software package was used to compute the sample-weighted average correlations (*r*+) based on a random effects model (REM). To examine heterogeneity between studies, we computed and reported the *Q* statistic, and the I^2 statistic (Higgins et al., 2003), as I^2 is more appropriate for meta-analyses with fewer studies (Huedo-Medina et al., 2006). The 95% confidence interval (CI) (Cochran, 1952) of every estimate was made around the true correlation score. The results are summarized in Table 3. All the analyses are reported according to Cohen's (1992) recommendations, where a correlation of $r = .10$ is small effect size, $r = .30$ is medium effect size, and $r = .50$ is large effect size. Forest plots are prepared to graphically display the relative strength of correlations included for each TPB relationship (Figure 3, Figure 4, and Figure 5). Publication bias is evaluated by using the Rosenthal Fail-Safe N method (Table 3). Publication bias is also subjectively assessed using funnel plots [Appendix Figure 1(a), Figure (1b), and Figure 1(c)].

Analysis and Results

Study Characteristics

A total of 15 research articles providing relevant information were included in the meta-analysis. A complete list of the study characteristics of all these 15 articles is provided in Table 1. The studies originated from 10 countries, with the USA ($n = 4$, 25%); Taiwan ($n = 3$, 18.75%); Malaysia ($n = 2$, 12.5%); China, Korea, Indonesia, Thailand, Turkey, UK, and Vietnam ($n = 1$, 6.25% each). Sample sizes ranged between 100 (George, 2004) and 569 (Rong-Da Liang & Lim, 2011). The composite sample size of this study is 4,443. The information on gender is available for 4,093 samples; 14 (93.33%) studies provided information on the gender composition, and only one (0.07%) study did not provide the gender composition of their samples; 1,895 (46.30%) male and 2,198 (53.70%) female

respondents are included in this study; 11 (73.33%) studies provided information on age categories, and six (40%) studies provided the mean age of the respondents. Information on the sample's education level was available in 13 studies (86.67%). The details on income were available in three (20%) studies. Five (33.33%) studies provided information about ethnicity/race details. Respondents were from diverse ethnicities/races like White/Caucasian American, Asian heritage, Malaysian, Indian, Chinese, Hispanic/Latino, Black/African-American, etc. Three (20%) studies provided information on the spending patterns of the respondents, six (40%) studies provided details about the frequency of online buying of the respondents, and three (20%) studies provided details about online information search/daily hours by their respondents.

Table 1. ***Study Characteristics***

Sr. No.	Study Details	Sample Size	Country	Participants	Correlation with Intention			Sample Characteristics
					ATT	SN	PBC	
1	Kim & Park (2005)	262	USA	UG students	0.57	–	0.65	262 undergraduate students from diverse ethnicity/races like Caucasian American 85.9%, Asian heritage 8.8 %, and African American 3.1% from the USA.
2	Rong-Da Liang & Lim (2011)	569	Taiwan	UG students	0.73	0.72	0.77	569 undergraduate students of Taiwan.
3	Korzaan & Rutner (2003)	346	USA	UG students	0.82	0.63	0.29	346 undergraduate students from the USA.
4	Aldousari et al. (2016)	370	Malaysia	PG students (Master's, PhD, & Post Doc)	–	–	0.654	MBA students of University Putra Malaysia. Malaysia 165 (44.6%), China 150 (40.5%), India 49 (13.2%), and others 6 (1.6%).
5	Kang & Kim (2012)	296	USA	UG, Graduate	0.44	0.42	0.4	296 undergraduate and postgraduate students from South-Eastern universities, USA. White/Caucasian 185 (62.8%), Hispanic/ Latino 37 (12.5%), Black/African-American 34 (11.8%).
6	Joo (2015)	565	Korea	College Students	0.545	0.425	0.423	565 Korean college students.
7	Li et al. (2018)	263	China	UG and PG students	–	–	0.5	263 Chinese undergraduate and postgraduate students.

8	Al-Swidi et al. (2012)	136	Malaysia	PG students (Master's, PhD, & Post Doc.)	0.406	0.455	0.694	136 master's, PhD, and post-doctoral PG students of UUM University, Malaysia. Malay 88 (64.7%), Chinese 12 (8.8%), Indians 10 (7.4%), others 26 (19.1%).
9	Kaplan (2018)	327	Turkey	UG, Graduate, & Associate Degree	0.94	0.862	0.866	327 undergraduate, graduate, and associate degree students of Niğde Ömer Halisdemir University, Turkey.
10	Laohapensang (2009)	263	Thailand	Graduate students	–0.1	0.47	0.5	263 graduate students from four major universities in Thailand.
11	Dennis et al. (2010)	150	UK	UG students	0.396	0.215	0.272	150 undergraduate students of UK University, London.
12	Lin (2007)	297	Taiwan	UG students	0.17	0.21	0.15	297 undergraduate students of the university in North Taiwan.
13	Nadlifatin et al. (2020)	167	Taiwan	University Students	0.36	0.46	0.27	167 Taiwanian university students.
14	Nadlifatin et al. (2020)	150	Indonesia	University Students	0.51	0.16	–0.03	150 Indonesian university students.
15	Lee & Ngoc (2010)	182	Vietnam	University Students	0.631	0.504	0.718	182 university students of Hanoi city, Vietnam.
16	George (2004)	100	USA	UG students	0.458	0.199	0.292	100 undergraduate students of USA. Asian 4 %, Black 12 %, Hispanic 5%, White 75%, and those who chose not to disclose their race 4%.

Summary Results

The relationships between attitudes, SN, PBC, and online purchase intention were evaluated. The findings (Table 3) confirm the existence of a strong relationship between attitude and purchase intention ($r = .62, p < .05, T = .44, R^2 = 38.44$) (Figure 3). The relationship between subjective norms and purchase intention ($r = .52, p < .05, T = .316, R^2 = 27.04$) (Figure 4) and between PBC and purchase intention ($r = .56, p < .05, T = .352, R^2 = 31.36$) (Figure 5) is also found to be strong (Cohen, 1992).

Figure 3. ***Forest Plot of Effect Size of Relationship Between Attitude and Purchase Intention***

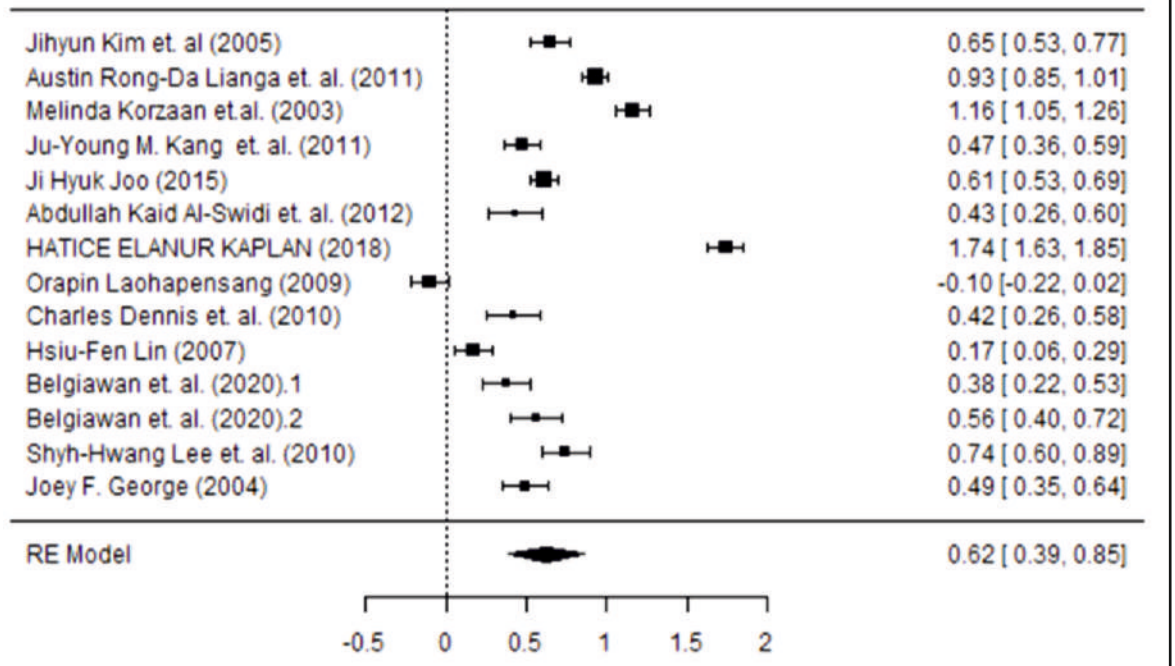


Figure 4. ***Forest Plot of Effect Size of Relationship Between Subjective Norms and Purchase Intention***

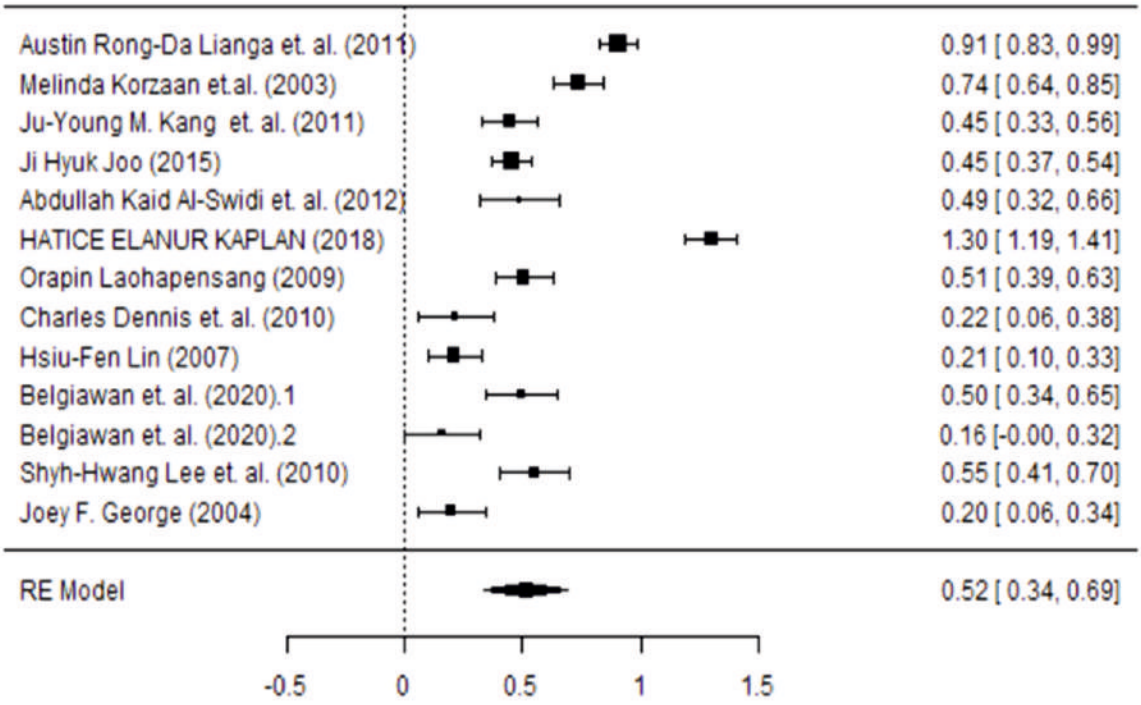
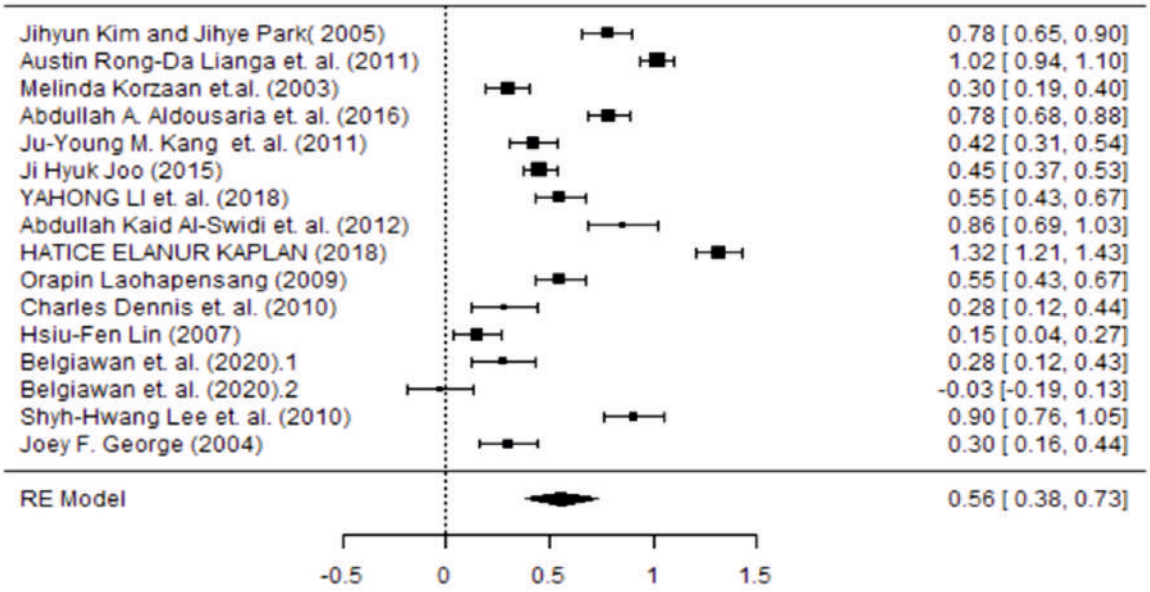


Figure 5. ***Forest Plot of Effect Size of Relationship Between Perceived Behavioural Control and Purchase Intention***



Heterogeneity

The values of the measures of heterogeneity, including Q statistics, I-square, tau (T), and tau-square (T^2), are reported in Table 2. Cochran's Q-test was used to test the hypothesis that "there is no difference in the effect sizes of all the studies included in the meta-analysis" (Borenstein et al., 2009). The hypothesis is rejected for all the effects (Table 2). With all the Q statistics being significant, all the correlations show significant heterogeneity amongst the studies. The I^2-values indicate the percentage of variability in the effect sizes due to true differences rather than chance. We followed tentative cut-offs for I^2 (Higgins et al., 2003) by interpreting 25% as low, 50% as moderate, and 75% as indicating high heterogeneity. The proportion of observed variance across studies, that is, due to heterogeneity (I^2), ranges from 96.44% to 98.13% (Table 2). The values of I^2 statistics indicate high heterogeneity in the relationships between all the TPB variables and online purchase intention (Higgins et al., 2003).

The readers are advised to consider the confidence intervals and standard deviation of the effect size (T ; i.e., dispersion) alongside the overall effect, as heterogeneity affects the precision of the mean effect size (Borenstein

Table 2. ***Indices of Heterogeneity***

Outcome (or Relationship)	*Q*-value	Degrees of freedom (*df*)	*p*-value (Significant at 0.10)	*I* square (I^2) values	Tau square (T^2) values	Tau (T)
Attitude & Purchase Intention	768.020	13	<.001	98.13%	0.1934 (SE = 0.0776)	0.440
Subjective Norms & Purchase Intention	367.403	12	<.001	96.44%	0.1 (SE = 0.0426)	0.316
Perceived Behavioral Control and Purchase Intention	532.593	15	<.001	97.17%	0.1241 (SE = 0.0469)	0.352

Table 3. ***Summary of Results***

Outcome (or Relationship)	Correlation*	*p*-value (Significant at 0.05)	95% Confidence Interval	Rosenthal's Fail-Safe N
Attitude & Purchase Intention	0.62	<.001	0.39 – 0.85	8037
Subjective Norms & Purchase Intention	0.52	<.001	0.34 – 0.69	4951
Perceived Behavioural Control and Purchase Intention	0.56	<.001	0.38 – 0.73	8512

Note. *The values .10, .30, and .50 correspond to small, medium, and large effect sizes (Cohen, 1992 ; Hemphill, 2003).

et al., 2009). However, it should be noted that a model of random effects allows true effect sizes to differ between studies and tackles the heterogeneity problem by using the estimate of true variance in effects (T^2) to assign weights in the meta-analysis to each research (Borenstein et al., 2009).

The results show that college students' attitude ($r = .62, p < .05, T = .44, R^2 = 38.44$) toward online shopping has the strongest association with their intention to purchase through the online mode. However, both PBC ($r = .56, p < .05, T = .352, R^2 = 31.36$) and subjective norms ($r = .52, p < .05, T = .316, R^2 = 27.04$) show strong relationships with the intention to purchase through the online mode (Nadlifatin et al., 2020).

Publication Bias

Published studies are usually assumed to represent a biased sample of all studies performed in behavioral sciences. Fail-Safe N is one approach previously used in meta-analyses involving the TPB to examine the possible effects of publication bias. Specifically, this approach is used to determine how many missing studies are needed before the overall effect becomes non-significant. In this review, potential publication bias is assessed by Rosenthal's Fail-Safe N (Borenstein et al., 2009; De Vivo et al., 2016). These results are summarized in Table 3.

Conclusion and Implications

This systematic review and meta-analysis summarize the literature for the period from 2003 – 2020 (inclusive) on college students' purchase intention towards online shopping using TPB. It is found that the TPB is a relevant conceptual framework for predicting college students' online purchase intentions. Students' attitude toward online shopping is the most influential variable in predicting their online purchase intention followed by perceived behavioral control and subjective norms. The findings of this study will be useful for academia and practitioners. This research will help managers focus their marketing efforts on the factors more significantly impacting the online purchase intentions of college students. Industry practitioners can use the findings of this study to target college students and predict their purchase behavior more accurately. This research will also help the academic community in their future empirical and qualitative research based on TPB, online shopping, and college students' online purchase behavior.

Limitations of the Study and Scope for Future Research

This systematic and meta-analysis study has only used the constructs of TPB to predict the purchase intention of college students in various countries. This study is also fragmented as the samples constituting undergraduate and post-graduate students were drawn from both developed and developing countries. The sample size of the studies

selected for meta-analysis ranges between 100 – 569. Future studies could involve moderation analysis so that further information on this topic can be explored in depth. Future studies may also involve some other target groups to predict their online purchase intentions using TPB. Future articles may also focus on other constructs, such as trust, website attractiveness, brand equity, perceived quality, etc., to predict purchase intention.

Authors' Contribution

Dr. Ashish Linge conceived the idea of the topic, conducted the literature search, analyzed the data, and wrote the manuscript in consultation with the co-authors. Dr. Mahesh Singh conceived the idea of the topic and conducted the literature search, diagram and table preparation, editing, and proofreading. Dr. Baldeo Kakde contributed to the literature search, preparation of the master chart, citations and references generation, and plagiarism testing. Krunal Panjwani contributed to searching the relevant literature.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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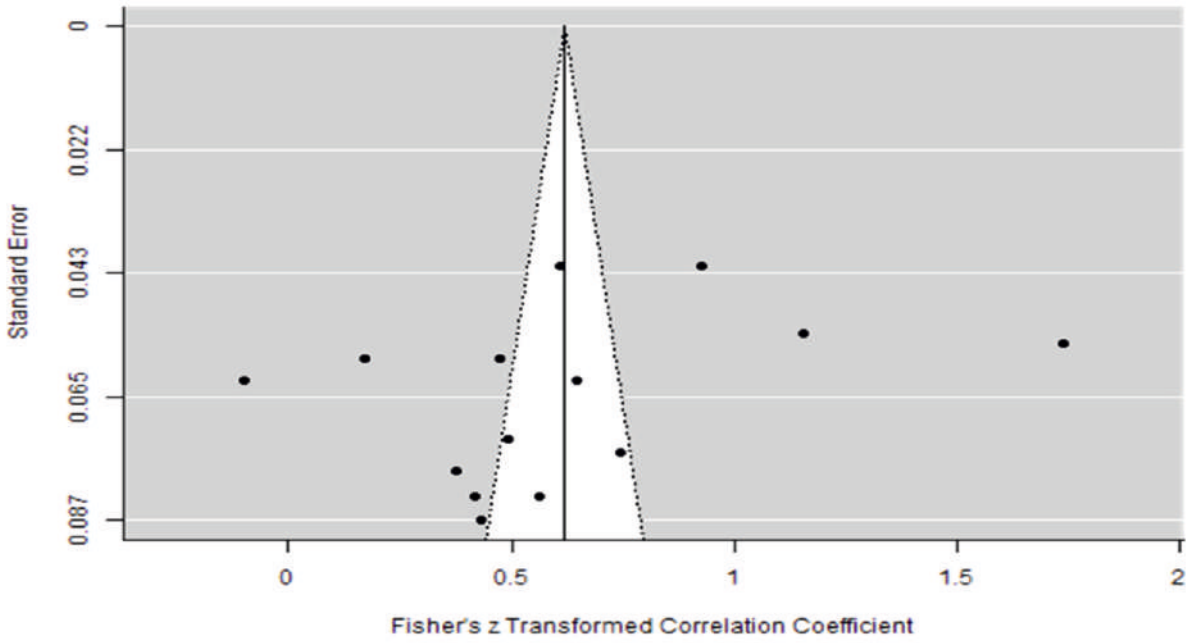
Appendix

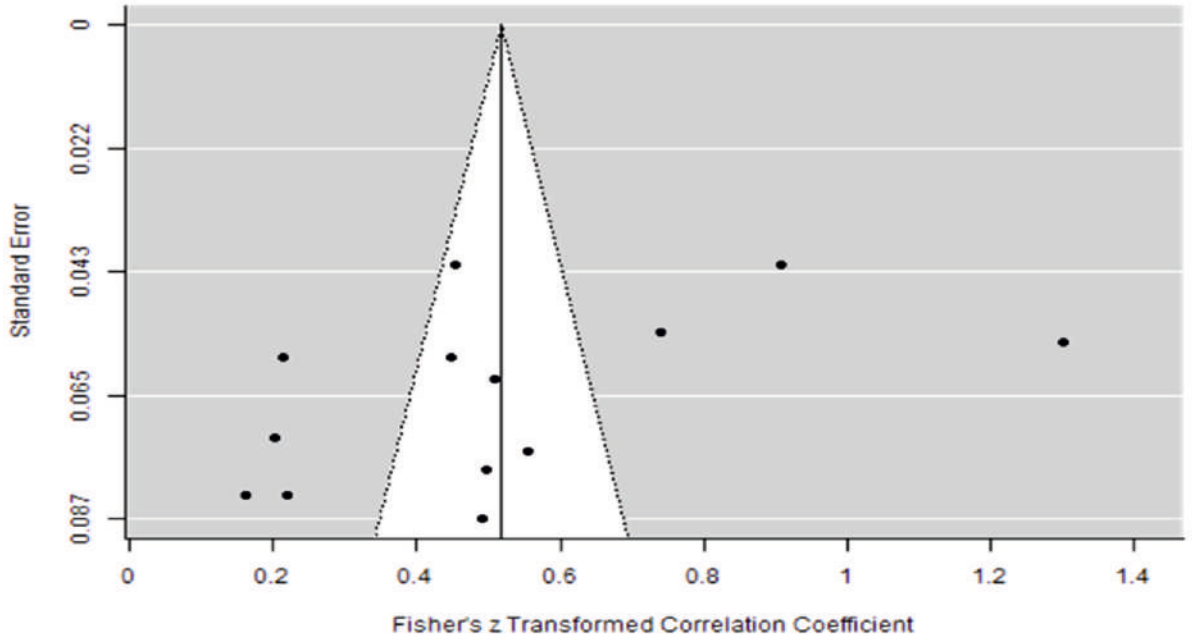
Appendix 1(a). ***Funnel Plot***

Funnel Plot between Attitude and Purchase Intention



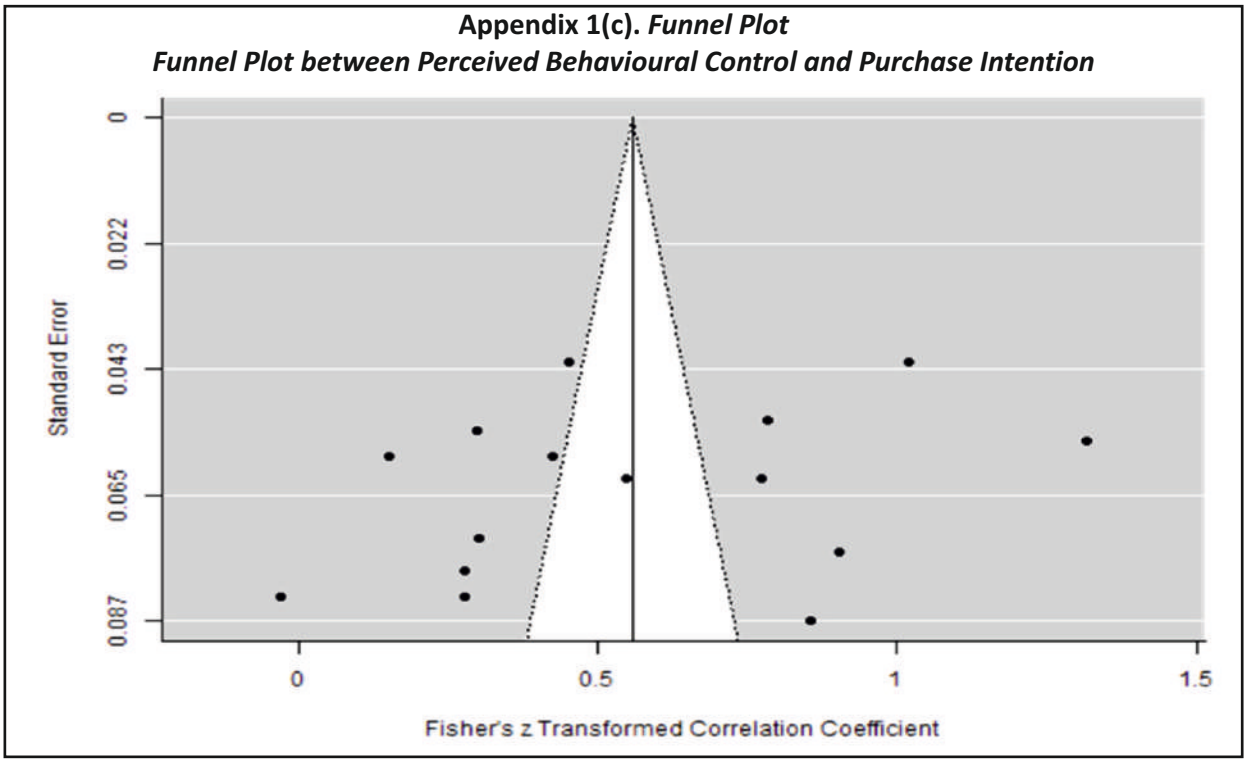
Appendix 1(b). ***Funnel Plot***

Funnel Plot between Subjective Norm and Purchase Intention



Appendix 1(c). ***Funnel Plot***

Funnel Plot between Perceived Behavioural Control and Purchase Intention



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