# Role of Desire and Implementation of Intention in the Theory of Planned Behavior: A Bibliometric Analysis

## Uturestantix[1]*; Bernardinus Maria Purwanto[2]; Andy Susilo Lukito-Budi[3]

[1,2]Doctoral Program, Department of Management, Faculty of Economics and Business, Universitas Gadjah Mada
Jln. Bulaksumur, Daerah Istimewa Yogyakarta 55281, Indonesia
[1]Department of Management, Faculty of Economics and Business, Universitas Cenderawasih
Jln. Kamp Wolker, Jayapura 99224, Indonesia
[3]Department of Management, Faculty of Economics and Business, Atma Jaya Catholic University of Indonesia
Jln. Jend. Sudirman No.51, Jakarta 12930, Indonesia
[1]uturestantix@yahoo.com; [2]bm-purwanto@ugm.ac.id; [3]andy.susilo@atmajaya.ac.id

**How to Cite:** Uturestantix, Purwanto, B. M., & Lukito-Budi, A. S. (2022). Role of Desire and Implementation of Intention in the Theory of Planned Behavior: A Bibliometric Analysis. *Binus Business Review, 13*(1), 97−107. https://doi.org/10.21512/bbr.v13i1.7898

## ABSTRACT

A weak finding of behavioral intention and behavior in the Theory of Planned Behavior (TPB) from a meta-analysis study by Armitage and Conner in 2001 has led to an increasing number of studies aiming to improve the TPB. Several researchers propose potential constructs to bridge the theoretical and empirical gap by suggesting that the construct of desire and the implementation of intentions can fill the theoretical and empirical gaps in the TPB model. The literature study aimed to retrospectively explore TPB studies with desire and implementation of intentions constructs in the behavioral science domain. The research retrieved 191 Scopus indexed papers (2012–2019) from the Google Scholars database. It summarized the descriptive data and produced visualization using VOSviewer. The results show that most studies developing the TPB model with other behavioral theories still focus on constructs to shape behavioral intentions because the behavioral intention construct is the best predictor of behavior. Most studies apply a quantitative approach with a cross-sectional survey design to collect primary data. In contrast, the experimental and longitudinal design approaches are relatively neglected in this TPB behavioral study. Furthermore, the analysis of 191 papers shows that the TPB model is often used in research in environmental, sustainable, and transport settings; health; psychological; hospitality and tourism; and innovation and technology. In addition, the use of the TPB model in research with entrepreneurial and legal settings is still limited. From these findings, the research proposes empirical research on TPB to implement further the relationship between desire and intention implementation to improve the TPB model by integrating the TPB model with several other theories, such as Mindset Theory of Action Phase and Model Goal-Directed Behaviour.

**Keywords:** desire, implementation of intention, Theory of Planned Behavior, bibliometric analysis

## INTRODUCTION

The Theory of Planned Behavior (TPB) explains and predicts individual behavior. This model has been widely applied in various fields of science (Carfora et al., 2019; Lee & Kim, 2018; Lin & Roberts, 2020; Moghimehfar, Halpenny, & Walker, 2018; Si et al., 2019a; Sun, 2020; Tiraieyari & Krauss, 2018). However, several studies with a meta-analytic approach show inadequate results (Armitage & Conner, 2001; Han & Stoel, 2017; Lin & Roberts,

2020; Nardi, Jardim, Ladeira, & Santini, 2019; Zaremohzzabieh et al., 2019). Furthermore, several studies that have integrated and compared TPB with several other behavioral theory models to improve the strength of the TPB model over the last three decades have shown inadequate results (Cheng, 2019; Choe, Kim, & Hwang, 2020; Feola, Vesci, Botti, & Parente, 2019; Li & Wu, 2019; Miller, Freimund, Metcalf, Nickerson, & Powell, 2019; Potard, Kubiszewski, Camus, Courtois, & Gaymard, 2018; Schuster, Tossan, & Drennan, 2017). The robustness of the TPB model

is still debated and discussed by behavioral researchers (Morren & Grinstein, 2021; Sun, 2020; Tornikoski & Maalaoui, 2019; Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020).

As explained in the Stimulus-Organism-Response (S-O-R) theory, individual behavior reflects individuals' mental processes after receiving a stimulus and evaluating it, as explained in the Stimulus-Organism-Response (S-O-R) theory (Kim, Lee, & Jung, 2020). Then, the TPB model assumes that individuals' behavior is always rational (Knauder & Koschmieder, 2019). Rational behavior reflects rational decisions. Individuals' rational decisions are formed from beliefs-attitudes, subjective norms, and behavioral control that individuals perceive. However, many researchers have questioned this assumption. They argue that the TPB model ignores the decision-making process involves elements of internal motivation in the individual's rational decision process (Bagozzi, Dholakia, & Basuroy, 2003; Perugini & Bagozzi, 2001).

Although individuals have positive attitudes and subjective norms towards an object, it does not directly influence or generate individual behavioral intention (Malle and Knobe, 2001). Following the basic assumptions of the TPB model, the behavior that individuals perform is also influenced by their inner desires (Schuster et al., 2017). Desire is a part of an individual's internal motivation (Ko, 2020). For example, confronted with an object of behavior (e.g., swimming behavior on the weekends), the individuals will not immediately decide or intend to swim on the weekends even though they have a positive attitude towards the behavior. They will first engage in some reasoning. Then, they must ensure that they can act in one way or another. Besides that, they must find out if they have other desires that exceed their desire to swim on the weekends. If they conclude that swimming can be done on weekends and there are no other desires, they can form intentions under the desires. This situation is supported by Perugini and Bagozzi (2001) by showing that intention-forming antecedents are fully mediated by desire. In line with research conducted by Shin, Kim, and Severt (2018), desire is more proximal to predict behavioral intentions.

The subsequent weakness found in the TPB model is that a long enough period for the individual behavior process will allow the occurrence of events that are not expected to change behavioral intentions (Ajzen, 2015). Thus, it can be said that behavioral intention is not the most proximal predictor of individual behavior. The Rubicon model introduced in the Mindset of Action Phase Theory (Heckhausen, 2007) which was later corrected by Oliveira and Rua (2018), shows that intention implementation is more proximal than the intention to measure behavior. According to Orbell, Hodgkins, and Sheeran (1997), in the experimental study, the intentions are implemented in the form of actions that can encourage individuals to carry out the final behavior as the goal.

Based on the initial literature, the researchers have conducted several studies by applying the TPB model and the integrated TPB model and comparing the TPB model. It can be concluded that the quantity of research that improves the TPB model by adding desire and intention implementation variables with satisfactory results is still limited. The conclusion is obtained after looking at the number of studies that have been done to establish the strength of the TPB model (e.g., Nguyen, Nham, & Hoang, 2019; Scalco, Noventa, Sartori, & Ceschi, 2017). In addition, the progress of applications and the current status of TPB in the context of decision-making, which is valuable and essential for future behavioral research, remains
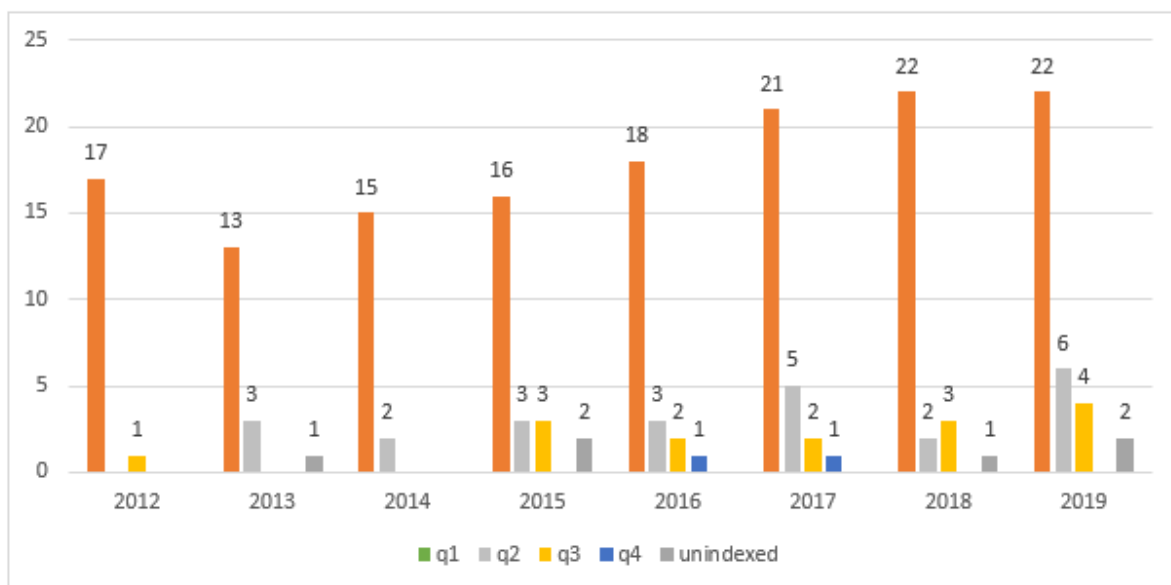


Figure 1 Number of TPB Publications in 2012–2019

unclear. Therefore, to strengthen the initial literature that the researchers have carried out, obtained conclusions, and approach the TPB model research in the future, in the literature study, the research applies the bibliometric analysis method to comprehensively understand the TPB model in the context of the decision process carried out by an individual. Bibliometric analysis methods have been widely used for knowledge bases in various fields (Indarti, Lukito-Budi, & Islam, 2020; Indarti, Hapsari, Lukito-Budi, & Virgosita, 2021; Si, Shi, Wu, Chen, & Zhao, 2019b). It can assist the retrospective analysis.

The main objective of the research is to summarize and measure the history of behavioral research using TPB and reveal the overall status of TPB in the field of behavioral science from a cross-disciplinary perspective, journal sources, country and region, article citations, and keywords. Furthermore, the research proposes a new, integrated, and comprehensive knowledge framework for applying TPB in behavioral science research, including distribution of current topics, theory integration, extended factors, main methods, specific groups, and control variables. Then, the research also aims to provide an in-depth and critical analysis of state of the art and identify research, challenges, and directions for future behavior. The research is expected to provide more comprehensive information to assist future researchers in quickly understanding the current body of TPB knowledge and inspiring future researchers.

The data in Figure 1 show the annual literature statistics for applying the TPB across disciplines from 2012 to 2019 in various fields of science. In its application, the previous research tries to understand the process of carrying out behavior in a planned and rational manner. The data show that from 2012 to 2019, the average annual growth rate in the TPB publication has reached 9,51%. Moreover, in 2019, there was an increase in publications reaching 34 papers. It can be said that until now, the application of the TPB model has still gotten attention from behavioral researchers in various disciplines. However, there has not been a systematic literature study approach like the research to the researchers' knowledge.

## METHODS

The research is divided into three parts. The first part covers the methods used to collect, copy, process, and analyze the reviewed papers presented. Then, the second part describes the results of data processing and analysis to answer the research questions. In the last part, a discussion of the results that lead to recommendations for further studies is summarized at the end of the research.

The research applies bibliometric analysis. Bibliometric analysis is a general strategy for quantitatively elaborating documents published in specific areas (Ji, Liu, Huang, & Huang, 2018). It is adopted in the research to measure and capture the application of TPB in several cross-disciplinary behavioral science fields. Bibliometrics are also helpful for analyzing the characteristics of the literature on specific topics, such as investigating the performance of authors, organizations, countries or regions, and journals that are often used as research references and revealing research trends in the future (Xu, Yu, & Wang, 2018; Yanbing et al., 2020). Elements of this technique consist of co-authorship analysis, co-occurrence analysis, citation and co-citation analysis, and knowledge domain mapping. However, bibliometric analysis can extract and visualize critical information from many documents and provide an objective reference for retrospective analysis. Unfortunately, bibliometric analysis cannot replace a systematic manual review (Li, Wu, Shen, Wang, & Teng, 2017; Si et al., 2019b).
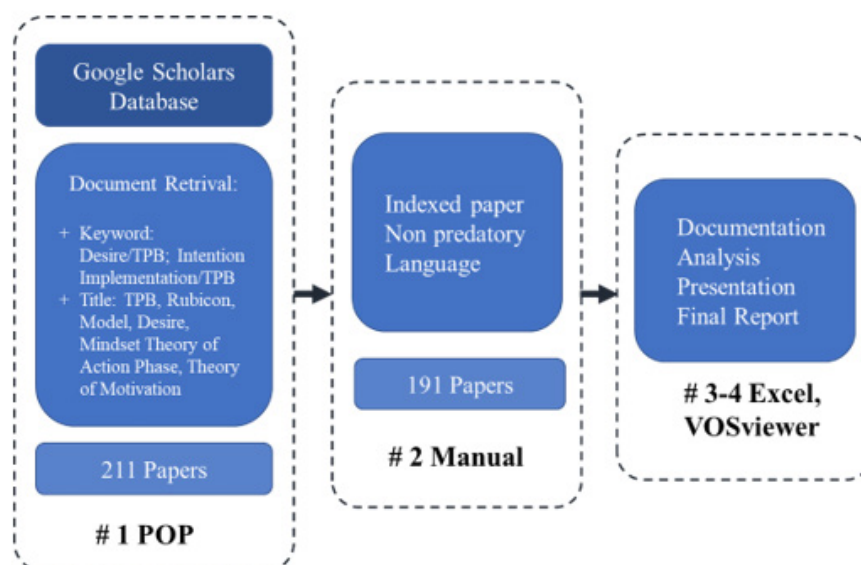


Figure 2 Research Stage

In general, a comprehensive discussion based on the results of the bibliometric analysis should be undertaken to provide a critical review. The research uses VOSviewer to perform the bibliometric analysis. VOSviewer has the advantage of mapping the knowledge domain. In addition, its label layer structure can clearly display dense network interactions, making it suitable for analyzing complex networks and large-scale data generated by a large number of quotes and keywords used.

Figure 2 presents the initial step to find the relevant published research using the Google Scholars database to source the papers. Then, referring to the conclusions that the researchers obtain based on the initial literature review done previously, in the bibliometric analysis, the researchers use Publish or Perish (POP) software with four combinations of keywords and title words to capture various topics related to TPB. For example, in the first combination, the researchers use the initial keyword "Theory of Planned Behavior" or "Desire" or "Rubicon" or "Mindset Theory of Action Phase" or "Intention Implementation" and the title word "Theory of Planned Behavior". The combination has resulted in 211 papers based on journals, proceedings, conferences, symposia, books, working papers/theses, and citations.

In the second step, the researchers establish specific criteria to select relevant papers for further analysis. Three criteria used to ensure the quality of the selected papers are language (English), index value (Scimagojr), and non-predatory journal (beallslist. weebly.com). As a result, the researchers obtain 191 papers for further analysis, consisting of 144 papers from Q1 (Scopus indexed), 22 papers from Q2, 14 papers from Q3, 2 papers from Q4, and 9 papers from non-Scopus indexed.

The third step is to enter data or systematically document 191 papers based on several central aspects of each paper, namely the theory used in the research, research methodology, research setting (i.e., country of origin), and research theme. This step is carried out with the help of Ms. Excel. The researchers detail some data from the collected papers (e.g., names of the variables used, the hypothesis testing results, and the proposed model proposition). In this step, cleaning the data and tidying the name of variables and other contents, such as theory, country, and others, are also done. The output of this third step is a clean database that is ready to be processed and analyzed.

The fourth step is data processing or analysis and presentation. The researchers use descriptive analysis techniques to map the data based on some essential information in this analysis. The data are used theories and methods, year and type of study (longitudinal or not), country of research conducted, rate of citation of the selected papers, and thematic setting scientific fields that apply TPB. The researchers use the VOSviewer software to visualize the findings based on the network of relationships between keywords and titles for further analysis. The results of VOSviewer data processing present clusters that are formed based on the relationship between keywords (or nodes) and other keywords (or nodes). Last, the researchers interpret these results further to answer the research questions.

## RESULTS AND DISCUSSIONS

The results of the 191 studies are discussed to answer the research question by referring to theories, perspectives, research methodologies, research settings (across disciplines), and research theme groups. The result notes the emergence of integrating between TPB and other behavioral theories. Various behavioral theories (see Table 1) have been used to improve the explanatory and predictive power of TPB. Most studies still replicate and extend the TPB model in various contexts. Nevertheless, the six theories used show that these theories (number 2–7 in Table 1) are close to the TPB discussion, which seeks to explain the stages or processes of making individual decisions to behave. Table 1 shows the development of the application of the TPB Model in various cross-disciplines.

Furthermore, Table 2 shows the method used in 191 papers. There are five studies of the TPB model in conceptual papers (i.e., traditional literature reviews), and most of the other studies are empirical papers. In terms of research methods, surveys (quantitative approach) dominate the findings (172 studies). The result is followed by an experimental method with 7 studies, a meta-analysis with 3 studies, and mixed methods (quantitative and qualitative approaches) with 2 studies. Meanwhile, case studies, and Focus Group Discussions (FGDs)/interviews are in the lowest position, with 1 study each. Then, many empirical studies combine more than one approach like survey and interview or surveys and FGDs.

However, out of 191 studies over the past eight years, only 15 studies use the longitudinal survey method to capture the behavioral processes in the TPB model. At the same time, the essence of research with a longitudinal design is to increase the study's validity, which cannot be achieved by using cross-sectional research (Stritch, 2017). The use of the longitudinal design is shown in Table 2 and Table 3. It indicates that there have been few prospective studies during the last eight years. It shows that the TPB model for prospective research in behavioral science is still very much needed compared to the application of the TPB model in several retrospective studies with a cross-sectional survey design.

However, the TPB research model involving the FGD method is only found in one study during the last eight years (see Table 2). Therefore, it can be concluded that the lack of the FGD approach is one of the factors causing the TPB model that has been applied in various behavioral contexts to be debated until the research is conducted. The conclusions are based on Malle and Knobe (2001) and Perugini and Bagozzi (2001), distinguishing desire and intention.

Table 1 Development of Application (Replication/Expansion/Integration/Comparative Theory)
of the TPB Model in Various Cross-Disciplines

| No | Theory | Number of Theory Usage |
|----|--------|------------------------|
| 1 | Theory of Planned Behavior | 156 |
| 2 | The Theory of Ethical Consumer Intention Formation | 12 |
| 3 | Mindset Theory of Action Phase | 4 |
| 4 | Norm Activation Theory or Model | 4 |
| 5 | Model of Goal Directed Behavior | 2 |
| 6 | Social Cognitive Theory | 2 |
| 7 | Self Determination Theory | 2 |
| 8 | Theory of Reasoned Action | 1 |
| 9 | Institutional Theory | 1 |
| 10 | Physical Activity Maintenance Theory | 1 |
| 11 | Neo-Socioanalytic Theory | 1 |
| 12 | Confirmation Interaction Model | 1 |
| 13 | Social Exchange Theory | 1 |
| 14 | Technology Acceptance Model | 1 |
| 15 | Health Belief Model | 1 |

Table 2 Method Used in TPB Publications

| Research Methods | Year | | | | | | | | Total |
|------------------|------|------|------|------|------|------|------|------|-------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | |
| Conceptual | | 1 | | | 1 | 1 | | 2 | 5 |
| Meta-Analysis | | | 1 | | 1 | | | 1 | 3 |
| Case Study | | | | | 1 | | | | 1 |
| FGD/Interview | | | | | | | 1 | | 1 |
| Survey | 16 | 16 | 15 | 23 | 20 | 27 | 26 | 29 | 172 |
| Experiment | 2 | | 2 | | 1 | | | 2 | 7 |
| Mixed Methods | | | | | | 1 | 1 | | 2 |
| Total | 18 | 17 | 17 | 24 | 24 | 29 | 28 | 34 | 191 |

Meanwhile, if referring to the psychological view of the general public, it is known that intention and desire are used interchangeably for the same purpose.

The implementation of the TPB model over the last eight years has come from 191 countries (see Table 4). Regarding the country of origin, the application of the TPB model has been dominated by the USA (50 studies) and China (23 studies) during the last eight years. Meanwhile, studies regarding individual behavior using the TPB are still limited in several Southeast Asian countries, such as Malaysia (4 studies), Singapore (3 studies), and Indonesia (2 studies). Therefore, this guide provides prospects for behavioral researchers who use the TPB model to examine Southeast Asian countries. These countries are rich in culture, customs, religion, ethnicity, and race. For example, Malaysia and Singapore consist of three major nations (Malay, Chinese, and Indian). Furthermore, Indonesia has 1.340 ethnic groups and 1.100 regional languages (BPS, 2010).

Furthermore, based on Table 4, the researchers group these countries and find that 64% of behavioral studies using the TPB model are often carried out in developed countries. On the other hand, around 31% are carried out in developing countries. The remaining 5% are unknown because the previous researchers do not mention the country where the research is conducted.

Next, referring to the subject classification system in Scopus, the results analyze the research objectives of 191 studies that apply TPB. It results in 19 disciplines (see Figure 3). The proportion of the 19 disciplines area is 30% in business, management, and accounting (covering marketing, entrepreneurship,

innovation, organization management, hospitality, travel, and tourism), 13% in the environmental area (such as the environment, recycling, landscape and urban planning, and clean production), and 10% in psychology; drugs; and agriculture and biology. Furthermore, about 5% of studies are in information, computers, and technology; public health; clinical; and communication. The rest is in sexology; pharmacy; laws, demographics; decision sciences; and nursing. These fields have the opportunity to be developed further in future research. Furthermore, in pharmacy, laws, and nursing, the research that adopts the TPB model tends to be replicative. Moreover, some studies adopt the TPB model but do not measure behavior. The studies only measure behavioral intention.

Next, the researchers visualize potential networks between keywords and paper titles that reflect an article's theme, method, and content using VOSviewer (see Figure 4). It shows that intention is the most frequently occurring word. It is undoubtedly the most commonly discussed variable of the TPB research since several meta-analytical studies have shown that intention often fails to predict behavior. Furthermore, the results from the visualization show that several studies with TPB from 2012 to 2019 have investigated some predictors of initial intentions, such as self-efficacy, social norms, Perceived Behavioral Control (PBC), and knowledge. Many studies are often carried out with survey designs with individual units of analysis level (such as students and consumers), and no unit of analysis at the group level is found. In several behavior studies, the decision-making process is caused by many considerations (groups), such as buying a house, marrying, taking a tour, and touring with the community.

Finally, Figure 5 shows the trend of citations that apply the TPB from 2012 to 2019. There has been an increasing and decreasing trend from 2012 to 2016. Then, from 2017 to 2019, the citation trend decreased. A downward trend in the citation has occurred since 2017 because these studies have not maximized the number of research findings that prove the importance of the desire and intention implementation.

Table 3 Nature of Study by Timeline

| Longitudinal | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
| Yes | 1 | 3 | | 3 | 2 | | 1 | 5 | 15 |
| No | 17 | 14 | 17 | 21 | 22 | 29 | 27 | 29 | 176 |
| Total | 18 | 17 | 17 | 24 | 24 | 29 | 28 | 34 | 191 |

Table 4 Implementation of the TPB Model in Various Countries

| Countries | Number of studies | Countries | Number of studies |
|---|---|---|---|
| Australia | 8 | Iran | 10 |
| Combined Countries | 6 | Italy | 4 |
| Belgium | 2 | Korea | 6 |
| Brazil | 1 | Malaysia | 4 |
| Canada | 5 | Norway | 3 |
| China | 23 | Pakistan | 4 |
| The Netherlands | 2 | Portugal | 1 |
| East Africa | 1 | Romania | 1 |
| Finland | 2 | Saudi Arabia | 1 |
| France | 7 | Serbia | 1 |
| EU | 1 | Singapore | 3 |
| Germany | 6 | Spain | 1 |
| Greek | 1 | Taiwan | 13 |
| Hong Kong | 1 | UK | 4 |
| India | 8 | USA | 50 |
| Indonesia | 2 | Not Available | 9 |
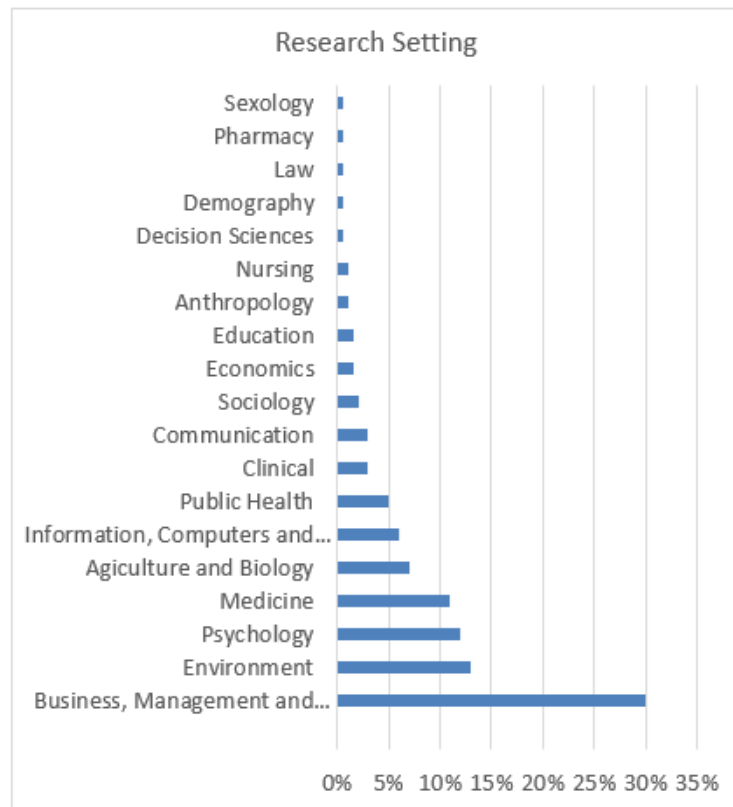
Figure 3 Research Setting in TPB Publications
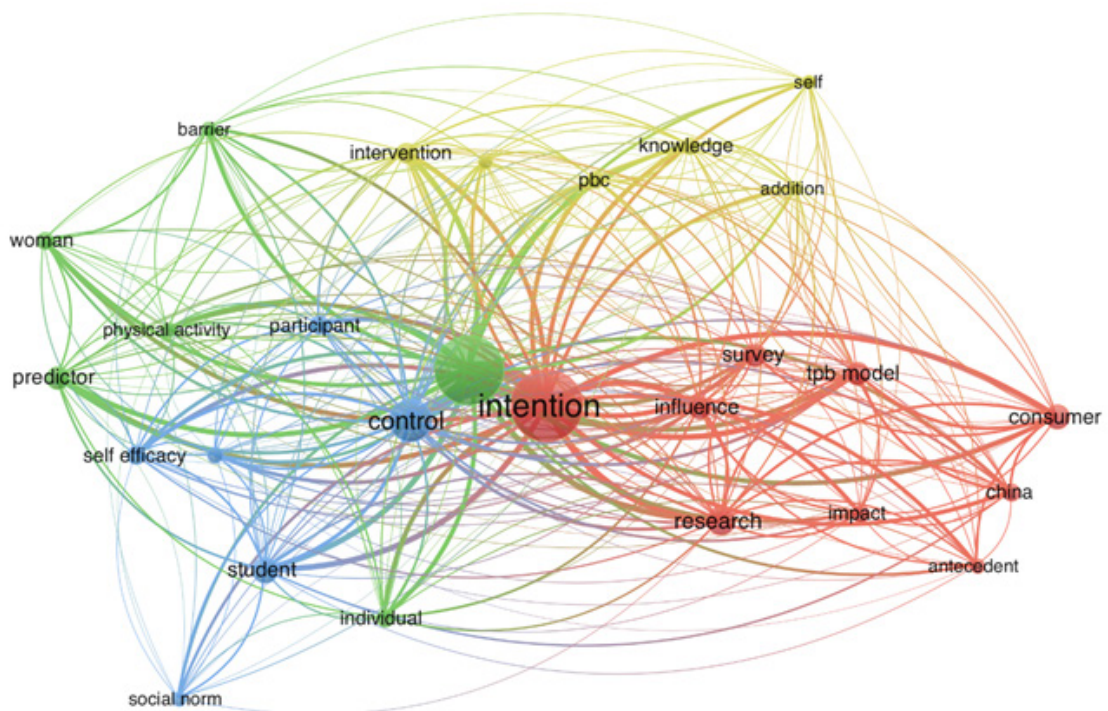


Figure 4 Network Visualization

Next, the researchers visualize potential networks between keywords and paper titles that reflect an article's theme, method, and content using VOSviewer (see Figure 4). It shows that intention is the most frequently occurring word. It is undoubtedly the most commonly discussed variable of the TPB research since several meta-analytical studies have shown that intention often fails to predict behavior. Furthermore, the results from the visualization show that several studies with TPB from 2012 to 2019 have investigated some predictors of initial intentions, such as self-efficacy, social norms, Perceived Behavioral Control (PBC), and knowledge. Many studies are often carried out with survey designs with individual units of analysis level (such as students and consumers), and no unit of analysis at the group level is found. In several behavior studies, the decision-making process is caused by many considerations (groups), such as buying a house, marrying, taking a tour, and touring with the community.

Finally, Figure 5 shows the trend of citations that apply the TPB from 2012 to 2019. There has been an increasing and decreasing trend from 2012 to 2016. Then, from 2017 to 2019, the citation trend decreased. A downward trend in the citation has occurred since 2017 because these studies have not maximized the number of research findings that prove the importance of the desire and intention implementation.

## CONCLUSIONS

The results of the bibliometric analysis of 191 behavioral studies using the TPB model show that most of the studies conducted are still replicating the TPB model proposed by Ajzen (1991). Furthermore, a number of theories such as Theory of Ethical Consumer Intention Formation; Norm Activation Theory or Model; Mindset Theory of Action Phase; Model of Goal Directed Behavior; Social Cognitive Theory; Self Determination Theory used for the development of the TPB model focus on the constructs that shape behavioral intentions. As stated by Ajzen (2005) which states that behavioral intention is the best predictor of behavior. However, the results of a systematic review of 191 studies show that there are only four studies that use the Mindset Theory of Action Phase approach and two Goal-Directed Behavior models. These two theories demonstrate their ability to explain a complex behavior. Therefore, it is recommended for further research to select complex behaviors (such as traveling abroad, buying a house, and starting a medium-sized business) by choosing

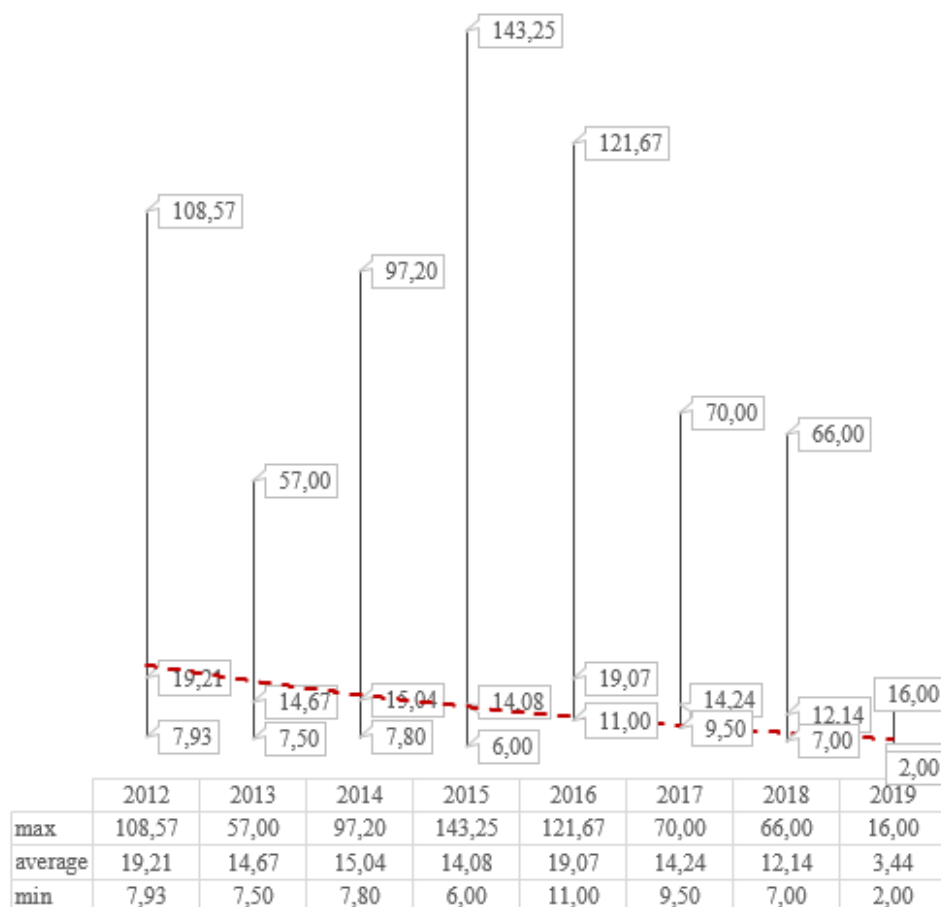| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|
| max | 108,57 | 57,00 | 97,20 | 143,25 | 121,67 | 70,00 | 66,00 | 16,00 |
| average | 19,21 | 14,67 | 15,04 | 14,08 | 19,07 | 14,24 | 12,14 | 3,44 |
| min | 7,93 | 7,50 | 7,80 | 6,00 | 11,00 | 9,50 | 7,00 | 2,00 |

Figure 5 Trends in Citation in Applying TPB

one of the two theories in developing the TPB model. In its implementation, it is necessary to review the role of the variables derived from the Mindset Theory of Action Phase and the Goal-Directed Behavior Model, i.e., each implementation of intentions and desires respectively. The desire variable plays an important role in determining behavioral intentions (Choi & Park, 2017; Ko, 2020; Schuster et al., 2017),while the intention implementation variable plays an important role in bridging the relationship between behavioral intentions and the final behavior that becomes an individual goal (Oliveira & Rua, 2018).

From a methodological perspective, it is expected that future behavioral research will use an experimental and longitudinal approach rather than using a cross-sectional survey approach. However, in measuring individual behavior which is relatively complex and dynamic, researchers should use a longitudinal approach (Stritch, 2017) rather than experimentally, because if using an experimental approach to measure this behavior it will cause an erroneous causality effect, because there are so many variables and aspects that are difficult to control in the experimental process (Van Gelderen, Kautonen, Wincent, & Biniari, 2018). The longitudinal approach is essential for assessing change and causal relationships (Purwanto, Indarti, Lukito-Budi, & Uturestantix, 2020). In principle, theory and behavioral science are closely related to change. Thus, identifying change requires a longitudinal study (Purwanto et al., 2020).

The results also show the utilization of the TPB model in agriculture, entrepreneurship, and the law is still limited. In addition, the setting of research locations in Southeast Asian countries combined with various relevant potential aspects can be considered for future research agendas. Then, the analysis results of 191 studies find that none of them uses the TPB model to predict behavior at the group level. Therefore, it is hoped that the next TPB model development will use the unit of analysis at the group level.

Finally, this research summarizes three groups of research themes that can be developed in future research. Future research could explore in-depth the potential relationship between desire; intention; and implementation of intentions and develop further measurements of the three constructs to improve the TPB model. The results of the analysis of 191 studies show that the TPB model proposed by Ajzen (1991) is inadequate when measuring complex behaviors that require high involvement in the decision-making process because the TPB model proposed by Ajzen (1991) ignores internal motivations that can encourage individuals to intend perform the behavior. The internal motivation referred to in this study is desire. Furthermore, in complex behavioral settings, individuals will face other behaviors connected to the final behavior that is the goal. Thus, the implementation of intentions becomes an important part that bridges the relationship between behavioral intentions and behavior. However, this research has limitations.

As for the limitations, the researchers use the Google Scholar database. Indeed, it is an extensive database, yet there are a lot of tidying-up works to prepare a clean dataset. For future research, it is suggested to use more exclusive databases, such as the Web of Science or Scopus, due to their better-structured data set. The following limitation is that the index criteria of the research paper only refer to the Scopus indexed journal. Although the research mitigates the index coverage by considering the citation level, it is still possible to miss recently good papers (non-Scopus indexed) due to their currently low citation index. Future bibliometric studies should consider recent publications in their dataset.

# REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I. (2005). *Attitudes, personality and behaviour*. McGraw-Hill Education.

Ajzen, I. (2015). The theory of planned behaviour is alive and well, and not ready to retire: A commentary on Sniehotta, Presseau, and Araújo-Soares. *Health Psychology Review*, *9*(2), 131–137. https://doi.org/10.1080/17437199.2014.883474

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology*, *40*(4), 471–499. https://doi.org/10.1348/014466601164939

Bagozzi, R. P., Dholakia, U. M., & Basuroy, S. (2003). How effortful decisions get enacted: The motivating role of decision processes, desires, and anticipated emotions. *Journal of Behavioral Decision Making*, *16*(4), 273–295. https://doi.org/10.1002/bdm.446

BPS. (2010). *Sensus penduduk 2010*. Retrieved from https://sp2010.bps.go.id/

Carfora, V., Cavallo, C., Caso, D., Del Giudice, T., De Devitiis, B., Viscecchia, R., ... & Cicia, G. (2019). Explaining consumer purchase behavior for organic milk: Including trust and green self-identity within the theory of planned behavior. *Food Quality and Preference, 76*, 1–9. https://doi.org/10.1016/j.foodqual.2019.03.006

Cheng, E. W. L. (2019). Choosing between the Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM). *Educational Technology Research and Development*, *67*, 21–37. https://doi.org/10.1007/s11423-018-9598-6

Choe, J. Y., Kim, J. J., & Hwang, J. (2020). The environmentally friendly role of edible insect restaurants in the tourism industry: Applying an extended theory of planned behavior. *International Journal of Contemporary Hospitality Management, 32*(11), 3581–3600. https://doi.org/10.1108/IJCHM-04-2020-0352

Choi, Y. J., & Park, J. W. (2017). The decision-making processes of duty-free shop users using a goal directed behavior model: The moderating effect

of gender. *Journal of Hospitality and Tourism Management*, *31*, 152–162. https://doi.org/10.1016/j.jhtm.2016.11.001

Feola, R., Vesci, M., Botti, A., & Parente, R. (2019). The determinants of entrepreneurial intention of young researchers: Combining the theory of planned behavior with the Triple Helix Model. *Journal of Small Business Management*, *57*(4), 1424–1443. https://doi.org/10.1111/jsbm.12361

Han, T. I., & Stoel, L. (2017). Explaining socially responsible consumer behavior: A meta-analytic review of theory of planned behavior. *Journal of International Consumer Marketing. 29*(2), 91–103. https://doi.org/10.1080/08961530.2016.1251870

Heckhausen, J. (2007). The motivation-volition divide and its resolution in action-phase models of developmental regulation. *Research in Human Development*, *4*(3–4), 163–180. https://doi.org/10.1080/15427600701662983

Indarti, N., Hapsari, N., Lukito-Budi, A. S., & Virgosita, R. (2021). Quo vadis, ethnic entrepreneurship? A bibliometric analysis of ethnic entrepreneurship in growing markets. *Journal of Entrepreneurship in Emerging Economies*, *13*(3), 427–458. https://doi.org/10.1108/JEEE-04-2020-0080

Indarti, N., Lukito-Budi, A. S., & Islam, A. M. (2020). A systematic review of halal supply chain research: To where shall we go? *Journal of Islamic Marketing*, *12*(9), 1930–1949. https://doi.org/10.1108/JIMA-05-2020-0161

Ji, L., Liu, C., Huang, L., & Huang, G. (2018). The evolution of Resources Conservation and Recycling over the past 30 years: A bibliometric overview. *Resources, Conservation and Recycling*, *134*(July), 34–43. https://doi.org/10.1016/j.resconrec.2018.03.005

Knauder, H., & Koschmieder, C. (2019). Individualized student support in primary school teaching: A review of influencing factors using the Theory of Planned Behavior (TPB). *Teaching and Teacher Education, 77*(January)*, 66–76. https://doi.org/10.1016/j.tate.2018.09.012

Kim, M. J., Lee, C. K., & Jung, T. (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of Travel Research, 59*(1), 69–89. https://doi.org/10.1177/0047287518818915

Ko, H. C. (2020). Beyond browsing: Motivations for experiential browsing and goal-directed shopping intentions on social commerce websites. *Journal of Internet Commerce*, *19*(2), 212–240. https://doi.org/10.1080/15332861.2020.1747219

Lee, S. J., & Kim, H. L. (2018). Roles of perceived behavioral control and self-efficacy to volunteer tourists' intended participation via theory of planned behavior. *International Journal of Tourism Research*, *20*(2), 182–190. https://doi.org/10.1002/jtr.2171

Li, C., & Wu, Y. (2019). Understanding voluntary intentions within the theories of self-determination and planned behavior. *Journal of Nonprofit & Public Sector Marketing*, *31*(4), 378–389. https://doi.org/10.1080/10495142.2018.1526745

Li, X., Wu, P., Shen, G. Q., Wang, X., & Teng, Y. (2017). Mapping the knowledge domains of Building Information Modeling (BIM): A bibliometric approach. *Automation in Construction*, *84*(December), 195–206. https://doi.org/10.1016/j.autcon.2017.09.011

Lin, N., & Roberts, K. R. (2020). Using the theory of planned behavior to predict food safety behavioral intention: A systematic review and meta-analysis. *International Journal of Hospitality Management, 90*(September), 1–10. https://doi.org/10.1016/j.ijhm.2020.102612

Malle, B. F., & Knobe, J. (2001). The distinction between desire and intention: A folk- conceptual analysis. In B. F. Malle, L. J. Moses, & D. A. Baldwin (Eds.), *Intentions and intentionality: Foundations of social cognition* (pp. 45–67). MIT Press.

Miller, Z. D., Freimund, W., Metcalf, E. C., Nickerson, N., & Powell, R. B. (2019). Merging elaboration and the theory of planned behavior to understand bear spray behavior of day hikers in Yellowstone National Park. *Environmental Management*, *63*, 366–378. https://doi.org/10.1007/s00267-019-01139-w

Moghimehfar, F., Halpenny, E. A., & Walker, G. J. (2018). Front-country campers' constraints, negotiation, and pro-environment behavioral intention: An extension to the theory of planned behavior. *Leisure Sciences, 40*(3), 174–193. https://doi.org/10.1080/01490400.2017.1344163

Morren, M., & Grinstein, A. (2021). The cross-cultural challenges of integrating personal norms into the theory of planned behavior: A Meta-Analytic Structural Equation Modeling (MASEM) approach. *Journal of Environmental Psychology, 75*(June), 1–16. https://doi.org/10.1016/j.jenvp.2021.101593

Nardi, V. A. M., Jardim, W. C., Ladeira, W., & Santini, F. (2019). Predicting food choice: A meta-analysis based on the theory of planned behavior. *British Food Journal, 121*(10), 2250–2264. https://doi.org/10.1108/bfj-08-2018-0504

Nguyen, T. M., Nham, P. T., & Hoang, V. N. (2019). The theory of planned behavior and knowledge sharing: A systematic review and meta-analytic structural equation modelling. *VINE Journal of Information and Knowledge Management Systems*, *49*(1), 76–94. https://doi.org/10.1108/VJIKMS-10-2018-0086

Oliveira, A., & Rua, O. L. (2018). From intention to entrepreneurial action: Assessing the impact of the barriers on the creation of new organizations. *RAUSP Management Journal, 53*(4), 507–534. https://doi.org/10.1108/RAUSP-07-2018-0039

Orbell, S., Hodgkins, S., & Sheeran, P. (1997). Implementation intentions and the theory of planned behavior. *Personality and Social Psychology Bulletin*, *23*(9), 945–954. https://doi.org/10.1177/0146167297239004

Perugini, M., & Bagozzi, R. P. (2001). The role of desires and anticipated emotions in goal-directed behaviours: Broadening and deepening the theory of planned behaviour. *British Journal of Social Psychology*, *40*(1), 79–98. https://doi.

org/10.1348/014466601164704

Potard, C., Kubiszewski, V., Camus, G., Courtois, R., & Gaymard, S. (2018). Driving under the influence of alcohol and perceived invulnerability among young adults: An extension of the theory of planned behavior. *Transportation Research Part F: Traffic Psychology and Behaviour*, *55*(May), 38–46. https://doi.org/10.1016/j.trf.2018.02.033

Purwanto, B. M., Indarti, N., Lukito-Budi, A. S., & Uturestantix. (2020). Berbagai bias dalam studi Longitudinal. In H. M. Jogiyanto (Ed.), *Bias di penelitian dan cara mitigasinya*. Yogyakarta: Penerbit Andi.

Scalco, A., Noventa, S., Sartori, R., & Ceschi, A. (2017). Predicting organic food consumption: A meta-analytic structural equation model based on the theory of planned behavior. *Appetite*, *112*, 235–248. https://doi.org/10.1016/j.appet.2017.02.007

Schuster, L., Tossan, V., & Drennan, J. (2017). Consumer acceptance of mhealth services: A comparison of behavioral intention models. *Services Marketing Quarterly*, *38*(2), 115–128. https://doi.org/10.1080/15332969.2017.1289791

Shin, Y. H., Kim, H., & Severt, K. (2018). Antecedents of consumers' intention to visit food trucks. *Journal of Foodservice Business Research, 21*(3), 239–256. https://doi.org/10.1080/15378020.2017.1368810

Si, H., Shi, J. G., Tang, D., Wen, S., Miao, W., & Duan, K. (2019a). Application of the theory of planned behavior in environmental science: A comprehensive bibliometric analysis. *International Journal of Environmental Research and Public Health*, 16(15), 1–26. https://doi.org/10.3390/ijerph16152788

Si, H., Shi, J. G., Wu, G., Chen, J., & Zhao, X. (2019b). Mapping the bike sharing research published from 2010 to 2018: A scientometric review. *Journal of Cleaner Production*, *213*, 415–427. https://doi.org/10.1016/j.jclepro.2018.12.157

Stritch, J. M. (2017). Minding the time: A critical look at longitudinal design and data analysis in quantitative public management research. *Review of Public Personnel Administration, 37*(2), 219–244. https://doi.org/10.1177/0734371X17697117

Sun, W. (2020). Toward a theory of ethical consumer

intention formation: Re-extending the theory of planned behavior. *AMS Review*, *10*, 260–278. https://doi.org/10.1007/s13162-019-00156-6

Tiraieyari, N., & Krauss, S. E. (2018). Predicting youth participation in urban agriculture in Malaysia: Insights from the theory of planned behavior and the functional approach to volunteer motivation. *Agriculture and Human Values, 35*, 637–650. https://doi.org/10.1007/s10460-018-9854-8

Tornikoski, E., & Maalaoui, A. (2019). Critical reflections – The theory of planned behaviour: An interview with Icek Ajzen with implications for entrepreneurship research. *International Small Business Journal, 37*(5), 536–550. https://doi.org/10.1177/0266242619829681

Van Gelderen, M., Kautonen, T., Wincent, J., & Biniari, M. (2018). Implementation intentions in the entrepreneurial process: Concept, empirical findings, and research agenda. *Small Business Economics. 51*, 923–941. https://doi.org/10.1007/s11187-017-9971-6

Xu, Z., Yu, D., & Wang, X. (2018). A bibliometric overview of International Journal of Machine Learning and Cybernetics between 2010 and 2017. *International Journal of Machine Learning and Cybernetics. 10*, 2375–2387. https://doi.org/10.1007/s13042-018-0875-9

Yanbing, S., Zhu, R., Wang, C., Han, S., Liu, H., & Duan, Z. (2020). Bibliometric analysis of Journal of Nursing Management from 1993 to 2018. *Journal of Nursing Management. 28*(2), 317–331. https://doi.org/10.1111/jonm.12925

Yuriev, A., Dahmen, M., Paillé, P., Boiral, O., & Guillaumie, L. (2020). Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review. *Resources, Conservation and Recycling, 155,* 1–12. https://doi.org/10.1016/j.resconrec.2019.104660

Zaremohzzabieh, Z., Ahrari, S., Krauss, S. E., Samah, A. A., Meng, L. K., & Ariffin, Z. (2019). Predicting social entrepreneurial intention: A meta-analytic path analysis based on the theory of planned behavior. *Journal of Business Research*, *96*(March), 264–276. https://doi.org/10.1016/j.jbusres.2018.11.030