

Nguyen, Duc Trung; Tran, Van Dat; Ghafoor, Abdul

## Article

The Impact of Covid-19 lockdown on Intention to Follow Preventive Measures in Vietnam: Integrated Protection Motivation Theory and Theory Planned Behavior

Cogent Business & Management

## Provided in Cooperation with:

Taylor & Francis Group

*Suggested Citation:* Nguyen, Duc Trung; Tran, Van Dat; Ghafoor, Abdul (2022) : The Impact of Covid-19 lockdown on Intention to Follow Preventive Measures in Vietnam: Integrated Protection Motivation Theory and Theory Planned Behavior, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 9, Iss. 1, pp. 1-19, <https://doi.org/10.1080/23311975.2022.2054502>

This Version is available at:

<https://hdl.handle.net/10419/288653>

### Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

### Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by/4.0/>

# The Impact of Covid-19 lockdown on Intention to Follow Preventive Measures in Vietnam: Integrated Protection Motivation Theory and Theory Planned Behavior

Duc Trung Nguyen, Van Dat Tran & Abdul Ghafoor

To cite this article: Duc Trung Nguyen, Van Dat Tran & Abdul Ghafoor (2022) The Impact of Covid-19 lockdown on Intention to Follow Preventive Measures in Vietnam: Integrated Protection Motivation Theory and Theory Planned Behavior, Cogent Business & Management, 9:1, 2054502, DOI: [10.1080/23311975.2022.2054502](https://doi.org/10.1080/23311975.2022.2054502)

To link to this article: <https://doi.org/10.1080/23311975.2022.2054502>



© 2022 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.



Published online: 24 Mar 2022.



Submit your article to this journal [↗](#)



Article views: 2776



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 5 View citing articles [↗](#)



Received: 02 February 2022  
Accepted: 14 March 2022

\*Corresponding author: Van Dat Tran,  
Head of Marketing Department, Ho  
Chi Minh University of Banking,  
Vietnam  
E-mail: [dattv@buh.edu.vn](mailto:dattv@buh.edu.vn)

Reviewing editor:  
umair Akram, Guanghua School of  
Management, Peking University  
Guanghua School of Management,  
Haidian, CHINA

Additional information is available at  
the end of the article

## MARKETING | RESEARCH ARTICLE

# The Impact of Covid-19 lockdown on Intention to Follow Preventive Measures in Vietnam: Integrated Protection Motivation Theory and Theory Planned Behavior

Duc Trung Nguyen<sup>1</sup>, Van Dat Tran<sup>2\*</sup> and Abdul Ghafoor<sup>3</sup>

**Abstract:** Coronavirus (COVID-19), a highly transmissible disease that poses a global danger to human populations from 2019, had a pandemic breakout in Vietnam in May 2021. A total of 311 people responded to the online survey, which had 29 questions. The causal linkages of the latent factors construct were determined using structural equation modeling (SEM). Moreover, it integrated Protection Motivation Theory (PMT) and extended Theory of Planned Behavior (TPB) to evaluate factors affecting the intention to follow of COVID-19 prevention measures. As a consequence, SEM revealed that understanding of COVID-19 has a direct impact on risk perception. Moreover, the perceived risk of COVID-19 also had significant impacts on people's attitude and perceived behavior control. While this study discovered a positive influence of attitude and perceived behavioral control on subjective norms. Intention to follow had been significant direct effects by subjective norm, perceived risk. Thus, the current study is one of the first studies to analyze factors affecting the intention to follow COVID-19 prevention measures during the global pandemic. This study also contributes to the managers and operators of

### ABOUT THE AUTHORS

Duc Trung Nguyen is a lecturer in financial, banking and currently vice rector of Ho Chi Minh University of Banking.

Van Dat Tran is a lecturer in marketing and currently heads the Department of Marketing, Faculty of Business Administration, Banking University of Hochiminh City, Vietnam. Presently, he teaches subjects such as consumer behaviors, consumer psychology, brand management, marketing management.

Abdul Ghafoor is a lecturer at institute of Business Management Science, University of Agriculture Faisalabad. He has published some articles in the field of business management.

### PUBLIC INTEREST STATEMENT

By merging Protection Motivation Theory (PMT) and expanded Theory of Planned Behavior (TPB) and the mentioned arguments, it is essential for this study was to analyze factors affecting the intention to follow COVID-19 prevention measures among Vietnam during a lockdown period. This study's findings have a wide range of implications in both research and practice. In terms of theoretical contribution, the current research developed and evaluated a conceptual model based on the extended theory of planned behavior and Protection Motivation Theory (PMT) in order to determine which variables influenced the intention to follow the COVID-19 measures in Vietnam. Moreover, this research is one of the first empirical studies in Vietnam and 3 dimensions from TPB models, namely attitude, subjective norm, perceived behavior control. It also had found the positive effect of attitude, perceived behavior control on subjective norm, which contributed more deeply insights about this theory from the previous research.

measures to prevent the spread of diseases to find appropriate methods based on the factors affecting the effectiveness of COVID-19 prevention approaches.

**Subjects: Consumer Psychology; Marketing; Services Marketing; Consumer Behaviour; Marketing Communications**

**Keywords: perceived risk of Covid-19; attitude; perceived behavioral control; subjective norm; intention to follow**

## 1. Introduction

The Coronavirus Disease 2019 (COVID-19), dubbed the third pandemic of the twenty-first century (Perlman, 2020), has proceeded to wreak damage on virtually every nation on the globe (Kim et al., 2020). The first incidence was reported in Wuhan, China, in December 2019. The virus has been labelled as a new type of Coronavirus (novel Coronavirus-2019), as well as the sickness it produces. According to WHO, globally, there have been approximately 130 million confirmed cases as of 4 April 2021, with over 2.8 million instances resulting in the patient's death, including the Americas and Europe, which have been described as high infection zones for COVID-19. Particularly in Vietnam, as of 23 March 2020, there have been 123 cases reported across the country, equating to a cumulative rate of 12.7 cases/10 million residents. It seems to have ended in the last 2020, Vietnam's Ministry of Health continued to record the outbreak in May 2021. Until September 2021, Vietnam has also a total of 624,547 COVID-19 cases. The epidemic also caused the deaths of 15,660 people, which has been considered more serious than previous periods. The most recent occurrences of communal spread have been recorded in Ho Chi Minh City, Binh Duong, Dong Nai, Long An, and Tien Giang, among other places, in which Ho Chi Minh City accounted the largest proportion. The epidemic also claimed the lives of 15,660 people. The most recent occurrences of communal spread have been recorded in Ho Chi Minh City, Binh Duong, Dong Nai, Long An, and Tien Giang, among other places. According to WHO, fever (87.9%), dry cough (67.7%), tiredness (38.1%), sputum production (33.4%), and shortness of breath (18.6%) were among the most common signs and symptoms. As a result, hand cleanliness, covering mouth and nose while coughing or sneezing, avoiding close contact with anybody displaying symptoms of respiratory disease, and avoiding unprotected contact with farm or wild animals are all standard guidelines for preventing infection transmission (Akinbode et al., 2021; Cascella et al., 2020; Nguyen et al., 2020). Moreover, according to Gohel et al. (2020), a danger of COVID-19 spreads, people should take precautions to protect themselves against infection and restrict the spread of the virus to others. As a result, the media advocated the hashtag "Stay-at-home" to prevent the spread of COVID-19 (Prasetyo et al., 2020; T.T. Nguyen & Nguyen, 2021), in which many Vietnamese celebrities responded to this hashtag leading to positive effectiveness. According to George Black (2020), a writer in New York City (USA), Vietnam may have the most successful response to the COVID-19 through mass mobilization of the health care system, public personnel, and security forces, along with an intense and imaginative public education campaign. However, research teams are now researching a vaccine for preventing the COVID-19 virus, such as Astra and Pfizer. and etc. however, no medicine therapy for COVID-19 infectious diseases have yet been discovered (Paital & Agrawal, 2021). For those who were infected by the COVID-19 virus, the only remedial option is hospitalization and thorough care management based on each symptom. Thus, at the end of May 2021, the Vietnamese government imposed a total lockdown in Ho Chi Minh City, as a preventive measure to minimize the COVID-19 outbreak. This is widely known as one of the longest lockdown before (Trang and Danh, 2020).

Despite the presence of various studies on protective interventions in other nations, research conducted on the COVID-19 scenario in Vietnam is severely lacking. The study by Dao and Nguyen (2020) conducted a qualitative research about the useful lessons from Vietnam within controlling the COVID-19 pandemic. They emphasized that a multi-sectoral response strategy was established, with the Ministry of Health (MOH) playing a key role. Particularly, official newspapers, specific website of MOH; open television channels continuously provided daily updates on positive

cases, as well as repeated communications about COVID-19 prevention. Furthermore, Prasetyo et al. (2020) performed a research in the Philippines to determine which factors influence the perceived success of COVID-19 preventive efforts. To examine the factors impacting the perceived success of COVID-19 preventive measures among Filipinos during Enhanced Community Quarantine, they combined Protection Motivation Theory (PMT) and extended Theory of Planned Behavior (TPB). Their results pointed out that understanding of COVID-19 had significant direct effects on perceived vulnerability and perceived severity. Moreover, the intention to follow has a substantial indirect influence on perceived vulnerability and severity. According to Asnakew and Kerebih Asrese (2020), understanding the level of risk perception, perceived efficacy of preventive measures, and the role of information exposure on compliance behavior among the general public could help in fighting against the coronavirus pandemic.

By merging Protection Motivation Theory (PMT) and expanded Theory of Planned Behavior (TPB) and the mentioned arguments, it is essential for this study was to analyze factors affecting the intention to follow COVID-19 prevention measures among Vietnam during a lockdown period in Ho Chi Minh City, Vietnam. The present study is one of the first to look into the elements that influence how effective COVID-19 prevention methods are viewed during the worldwide pandemic, which has been highly spreading in Vietnam, especially in Ho Chi Minh City from May to October 2021. Besides, the study has both theoretical and practical contribution. Firstly, from a theoretical viewpoint, our study builds on the PMT and TPB by factors affecting the perceived efficiency of COVID-19 prevention measures. Furthermore, this model was based on Prasetyo's study, which was the first time in Vietnam that any scholars had done so before. This study also contributes to the managers and operators of measures to prevent the spread of diseases to find appropriate methods based on the factors affecting the effectiveness of COVID-19 prevention approaches.

## 2. Literature review

### 2.1. Protection motivation theory

Protection motive theory of Rogers and Prentice-Dunn (1997) is a practical prescriptive notion in social psychology that has been acclaimed as one of the most effective explanatory models for predicting a person's protective intentions and conduct (Anderson & Agarwal, 2010). Protection motive theory, according to Janmaimool (2017) posits that individuals choose to participate in risky behavior. In the other words, the Protection motive theory was developed as a framework in understanding the effect of fear appeals and the well-being of individuals (Rogers & Prentice-Dunn, 1997), which consists of two aspects including threat appraisal and coping appraisal. In which, threat appraisal entails determining the degree of danger of negative effects posed by a hazardous event or unsafe activity. According to Floyd et al. (2000) and Rogers and Prentice-Dunn (1997), the threat-appraisal process evaluates risk based on perceived severity and perceived vulnerability. Moreover, based on the study by Wu, Dongming (2020), threat evaluation entails determining the degree of danger of negative effects posed by a hazardous event or unsafe activity, which is in terms of perceived severity and vulnerability (Rogers & Prentice-Dunn, 1997). Rogers and Prentice-Dunn (1997) supposed that perceived severity refers to the degree of harm to a person that is associated with an occurrence, whereas perceived vulnerability refers to the likelihood that a threatening event will occur. In the study of Wu, Dongming (2020), in terms of perceived vulnerability, it is defined as the evaluation of the likelihood of dangerous events. Perceived vulnerability describes the likelihood of negative outcomes if one reveals all of one's knowledge without reserve. Meanwhile, coping appraisal, on the other hand, is an assessment of one's ability to deal with and avoid a potentially dangerous situation (Y. Lee, 2011; Rogers & Prentice-Dunn, 1997), which consists of three sub-constituents: response efficacy, self-efficacy and response cost. According to Floyd et al. (2000), self-efficacy refers to an individual's perceived ability to exhibit behavior, whereas response efficacy refers to their assessment of the effectiveness of recommended risk-preventative behavior. Furthermore, Rogers and Prentice-Dunn (1997) found that response cost highlights possible expenses, such as time, effort, money, and so on. As consequences, response efficacy and self-efficacy are positively related to protective motivations in this

paradigm, while response cost is adversely associated. This model was widely used in the history of health research, including for health threats (Fosu & Ankrah Twumasi, 2021; Prasetyo et al., 2020), environmental hazards (Bockarjova & Steg, 2014) and preventive behaviors (Prentice-Dunn & Rogers, 1986).

Cho and Lee (2015) showed that there are several authors who applied and evaluated the protection motivation elements from Protect motivation theory to measure the behavioral intention to participate in self-protective action during the 2009 H1N1 influenza pandemic. However, in the context of COVID 19, few research has used the protective motive factors in analyzing consumer behavior in the context of the present COVID-19 epidemic. Particularly, perceived severity and self efficacy were studied as antecedents of intention to make atypical purchases by Laato et al. (2020). Besides, in their study to measure consumers' future desire to visit a restaurant, Foroudi et al. (2021) examined the moderating influence of perceived risk. Moreover, Ansari et al. (2021) used protective motivation theory to predict COVID-19 preventive behaviors in Iran showed that the response efficacy and self-efficacy predicted COVID-19 protective behaviors. While in Vietnam there are no studies based on the Protection motive theory during COVID-19 outbreak.

## **2.2. Theory of Planned Behavior (TPB)**

As an extension of the theory of reasoned action, the theory of planned behavior (Ajzen, 1985) was conducted with a lot of empirical evidence, adding perceived behavioral control has been frequently used to predict many sorts of human behavior (Conner & Armitage, 1998). TPB according to a study by Ajzen (1985) believes that behavioral intentions and behavioral control concepts come before human behaviors, and that behavioral intentions are influenced by behavioral attitudes, subjective norms, and perceived behavioral control. According to the TPB, three conceptually independent determinants drive behavioral intention: attitudes toward the behavioral, subject norms, and perceived behavior control (Al-Jubari et al., 2019). In which, people's overall assessment (positive or negative) or appraisal of the conduct in issue is referred to as attitudes toward behaviour (Ajzen, 1985). Subject norms, on the other hand, are the total of people's judgments of how significant people in their life think about them engaging in or not engaging in a specific action, for as starting a business (Al-Jubari et al., 2019). While people's perceptions of how easy or difficult an action is, as well as how much volitional control they have over it, are referred to as perceived behavior control (Ajzen, 1985). In this study, whether there is any relationship between the perceived risk of COVID-19 to three key variables of TPB model has a positive or negative impact. In addition, the author also proposed three mentioned variables, which were subject norms, and perceived behavior control, to find out whether these variables had a positive effect on intention to follow. Besides, within these three variables, this research tried to pointed out the relationship between perceived behavior control as well as subjective norms and attitude and subjective norms.

There is strong empirical evidence supporting applications of the TPB for predicting health behavior generally and for COVID-19 mitigation specifically (Starfelt Sutton & White, 2016). According to Norman et al. (2020), individuals' intention and trust in their capacity to interact in the action predicted later compliance with protective behaviors such as keeping physical distance and avoiding visiting relatives or friends. Moreover, subjective norms, perceived behavior control, and intentions were found to be positively related with later social distancing behavior by Hagger et al. (2020).

## **2.3. Hypothesis**

Yıldırım and Güler (2020) found that the COVID-19 epidemic has had a major influence on people's psychological and physical health. People worry, feel nervous, and believe they are at danger for the COVID-19 as a result of the pandemic's continual intensification, which results in lockdown, quarantine, and isolation (Yıldırım & Güler, 2020). It can be explained based on Protection Motivation Theory in the study of Janmaimool (2017), individuals are primarily motivated to participate in protective activity when they experience a hazardous situation. Meanwhile, Wise

et al. (2020) showed that people perform cost-benefit analysis to take precautionary actions, and they can engage in more specific precautionary actions during pandemics due to perceived high risk. Additionally, Johnson and Hariharan (2017) pointed out that giving health education and raising awareness during an outbreak is an effective way to help prevent the disease from spreading. Hence, the author considers whether understanding of COVID 19 can influence their perceived risk under the context of unobservable and unpredictable hazard from COVID 19.

**Hypothesis 1:** *Understanding COVID 19 has a positive influence on perceived risk of COVID 19*

According to Warkentin et al. (2002), risk assessment is a difficult undertaking; hence, this study focuses on perceived risk, which refers to a person's conviction that they will lose money in order to achieve a specific goal. Due to the impersonal and unpredictable nature of the COVID-19 pandemic, most of us cannot control the spread of the virus (Trang and Danh, 2020). From that, many previous authors found that perceived risk can be a predictor for many other variables, such as perceived usefulness (M.C. Lee, 2009), attitude (Gefen et al., 2003; Tasci & Soñmez, 2019; Troise et al., 2020); perceived behavior control (J.M. Hansen et al., 2018; Sitkin & Weingart, 1995; Xie et al., 2017) and etc. Xie et al. (2017) demonstrated the effect of perceived risk on perceived control behavior in the context of e-government. It can be explained that a respondent's confidence in carrying out their conduct is boosted by a lower risk perception. In other words, if consumers are concerned about the services, they may believe that accessing an e-government website is beyond their control. Moreover, J.M. Hansen et al. (2018) illustrated that the higher the perceived risk, the higher the level of perceived behavior control. Besides, the relationship between perceived risk and attitude was found in the study by Gefen et al. (2003) and Rahmafritra et al. (2021). When someone believes COVID-19 is a hazardous and high-risk pandemic, he or she will keep a safe distance and avoid traveling if the pandemic continues. Additionally, the study by Tasci and Soñmez (2019) also explained that the perception of a person will influence their attitude. However, Troise et al. (2020) found no effect of perceived risk of COVID-19 on attitude. Moreover, there is a lack of evidence of the perceived-risk effect on subject norm; however, Xie et al. (2017) had not found any link between perceived-risk and subject norm in the context of e-government. Therefore, this study proposes the following hypotheses to understand the influence of perceived risk of COVID 19 on the variables in the Planned behavioral theory model in Vietnam.

**Hypothesis 2:** *Perceived risk of COVID 19 has a positive impact on perceived control behavior.*

**Hypothesis 3:** *Perceived risk of COVID 19 has a positive impact on subject norm.*

**Hypothesis 4:** *Perceived risk of COVID 19 has a positive impact on Attitude.*

Yuriev et al. (2020) supposed that one of the most commonly utilized frameworks for examining individual actions is the TPB theory. According to Ajzen (1985), TPB claims that behavioral, normative, and control beliefs, also known as indirect predictors, influence the three determinants of intention. In particular, attitude is described as an individual's positive or negative view about a certain activity, which is influenced by the outcomes of that behavior as it is carried out. Meanwhile, subjective norm is a subjective belief in which people rely on the views or judgments of others to determine how they should or should not act. According to Jingru et al. (2017), facilitating circumstances and self-efficacy are factors that influence perceived control behavior. However, no previous studies investigated the association between these variables. Therefore, this study finds the relationship between perceived control behavior and subjective norm as well as the relationship between attitude and subjective norm.

**Hypothesis 5:** *Perceived control behavior has a positive impact on subject norm.*

**Hypothesis 6:** *Attitude has a positive impact on subject norm.*

Perceived behavioral control, according to the TPB in the study of Jingru et al. (2017), is a strong predictor of both behavioral intention and behavior. Furthermore, according to Lau et al. (2010), the variables of behavioral intention are directly related to the TPB model elements, such as perceived control behavior, attitude, and subjective norm. Meanwhile Xie et al. (2017) also significantly found the effect of perceived control behavior on intention in the context of reusing E-Government. They explained that when ones who had higher perceived control behavior, they will be more intent to reuse the E-Government. Besides, the study by T. Hansen et al. (2004) in the online purchasing context similarly shown the necessity of understanding perceived control behavior when analyzing the behavioral intention to purchase food online because the behavioral intention was positively influenced by perceived behavior control. Additionally, Troise et al. (2020) showed that the positive effect of perceived control behavior on the intention to use food delivery apps. Thus, this research examines whether there is any influence of perceived control behavior on the intention to follow the preventive measures of COVID-19 as the hypothesis below:

**Hypothesis 7:** *Perceived control behavior has a positive impact on the intention to follow the preventive measures of COVID-19.*

According to Ajzen (1985), he defined subjective norms as the felt social pressure to perform or not perform a behavior. The behavior of an individual is influenced by the norm in their society, according to a previous study (Chan et al., 2005). In the context of individual conformance in businesses, Chan et al. (2005) claimed that people are most willing to adhere with the organization's guidelines when employers and managers confer, collaborate, and follow the guidelines. Besides, in the context of the purchasing on the online, Troise et al. (2020) and Piroth et al. (2020) hypothesized that subjective norms positively impact the behavioural intention to use food delivery. They demonstrated that subjective norms correspond to customer perceptions of online buying based on the opinions of the referent group examples friends or colleagues (Lin, 2007). As a result, in the context of the COVID 19 epidemic in Vietnam, whether subjective norms have a favorable effect on the intention to adopt COVID-19 prevention measures.

**Hypothesis 8:** *Subject norm has a positive impact on intention to follow the preventive measures of COVID-19.*

According to Prasetyo et al. (2020), the view of a person executing a particular behavior is referred to as attitude toward behavior. Attitude is a predictor person's intention. In the scenario of shopping online, Yoh et al. (2003) supposed that consumer attitudes toward online buying have been shown to have a beneficial impact on their shopping intentions. Moreover, T. Hansen et al. (2004) extended to the previous studies showing that consumers' attitude towards online grocery shopping was the most important predictor of behavioral intention in online grocery shopping. Besides, people who have a good attitude are more likely to follow rules, requirements, and recommendations (Bulgurcu et al., 2010). Thus, we hypothesized the following to find out the relationship between attitude and intention to follow the preventive measures of COVID-19.

**Hypothesis 9:** *Attitude has a positive impact on intention to follow the preventive measures of COVID-19.*



### 3. Materials and methods

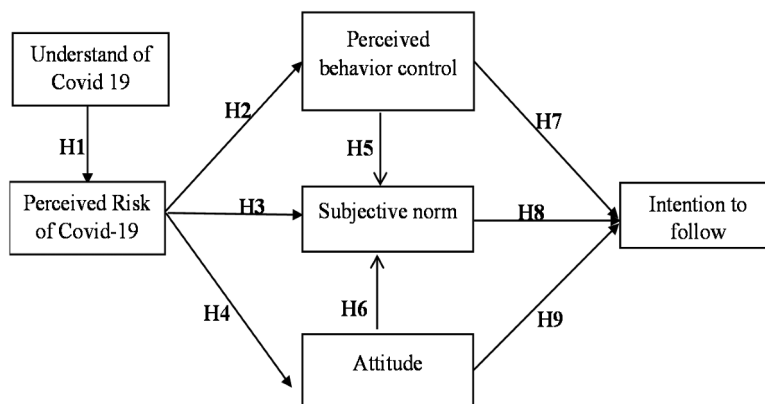
#### 3.1. Research framework

The COVID-19 (coronavirus) outbreak has stunned humanity, wreaking havoc on the global economy and posing humanitarian and health-safety issues (Bae & Chang, 2020). Based on the previous literature, this research not only integrated the role of perceived risk towards COVID 19 but also extended TPB model including 3 main elements such as attitude, subjective norms and perceived control behavior to determine the causal relationships between determined variables and latent assemblies (see, Figure 1). The current study is one of the first research to have analyzed factors affecting the perceived effectiveness of COVID-19 prevention measures in Vietnam during the 2020 pandemic. As consequences, the central objective was to assess the factors influencing Vietnamese perceptions of COVID-19 preventative efforts during a lockdown period in Ho Chi Minh City.

#### 3.2. Procedure

In terms of collecting data, this study gathered insight from Vietnamese residents through social networks, such as Zalo, Facebook, and Gmail. McDonald and Adam (2003) demonstrated that within the high risk of spreading the COVID-19 virus, the online methodology was used not only because of the less expensive cost and quicker but also it is suitable for the authors to obey the government directive “Stay at home” and avoid crowds to prevent direct contact further spread the disease. A Google form by Vietnamese was used to send to the potential participant through posting on the Facebook groups or the individual’s account, the individual’s Zalo account, and sending emails for searching the respondents. Moreover, the questionnaire was pilot-tested with a sample of 10 respondents over a 2-day period prior to the main research. Because it assisted in the discovery of problematic questions, pretesting is typically more beneficial in gaining a better understanding of how and why certain questions could not perform as expected (Buschle et al., 2021). In this test, the author would ask them the relevance of the questionnaire, logicity, and usability, the wording, and item sequence. As a result, there were no concerns with the questionnaire’s item clarity or readability. Moreover, the research area was mostly in Ho Chi Minh City in Vietnam because this city has the leading number of COVID-19 cases in the country and this trend has not cooled down until mid-September 2021. Despite the stringent precautions, the number of illnesses in Ho Chi Minh City continues to grow, with more than 200 people dying every day. Therefore, it is essential to find out the contributing factors that influence the success of efforts to prevent the spread of COVID 19 in Ho Chi Minh City. Furthermore, in the study Temkin (2009), the authors concentrate on the 18–31-year-old age group, which accounts for more than 20% of all Internet users who are easily getting online survey instead of other aged groups.

Figure 1. Research Framework.



### 3.3. Questionnaire design

A five-part questionnaire is designed to collect data, including basic demographic information, perceived risk, understanding of COVID-19, TPB model, and Intention to follow the preventive measures of COVID-19. For the first part, respondents will be asked to provide personal characteristics such as gender, age, occupation, household income, education level. In the measurement items' part, a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. Understanding of COVID-19 was adopted from Liu (2020); Coccia (2020) and Nicola et al. (2020) while perceived risk of COVID-19 from Protection motivation theory was adapted from Beirman (2006). Moreover, three variables from planned behavior theory, namely attitude (Sarkodie & Owusu, 2020; Shader, 2020; Dariya & Nagaraju, 2020; Roy et al., 2020; D'Amours, 2020), subjective norm (Centers for Disease Control and Prevention, 2020; Conner & Armitage, 1998; Yancey-Bragg and Bravo, 2020; USA Food & Drug Administration, 2020; Adam, 2020) and perceived control behavior, were adopted from Sato (2018); Shen et al. (2020) Veldhuijzen et al., 2006 and Barati (2020). In which, the variable "attitude" was conducted with seven items, and the variable "subjective norm" with five items, while the variable "perceived control behavior" with four items. Additionally, the variables "Intention to follow" was based on many previous research including Barati (2020); Sen-Crowe et al. (2020); Oyeniran and Chia (2020); University of Michigan School of Public Health (2020), which has 5 items (see, Table 1).

## 4. Results

### 4.1. Demographic statistics

The online questionnaire was conducted via Google Form to 390 Vietnamese respondents, with the research goals specified. In addition to publishing the poll on Facebook, the target sample received an e-mail and Zalo messages explaining the research's aim and inviting respondents to participate in the online survey. Within 45 days, the survey questionnaire's link was shared on Facebook and social media groups to urge potential respondents to take part in the study. The data analysis procedure employed 331 out of 311 valid online surveys. The response rate was 94% percent. The suitable sample size was based on the study by Hair et al. (1998). They showed that the sample size should be at least 5 times the number of variables in the factor analysis. Thus, the minimum sample size should be 145 because the study had 29 observed variables (see, Table 2)

### 4.2. Construct reliability

Cronbach's alpha is a statistic commonly used by writers to demonstrate that tests and scales developed or approved for research studies are appropriate for objective (Taber, 2018). Cronbach's alpha has to meet the following requirements to be considered valid: The reliability of the scale was tested using Cronbach's Alpha coefficient, and the scale was determined to be trustworthy with a Cronbach's alpha reliability value better than 0.7 (Nunnally, 1978). The following are the Cronbach's alpha indices of their variables: understanding of COVID 19 = 0.915, perceived risk = 0.821, perceived behavior control = 0.846, subjective norm = 0.899, attitude = 0.910, and intention to follow = 0.944. Hence, it showed that almost Cronbach's Alpha coefficient >0.7 and the Corrected Item—Total Correlation >0.4. As a consequence, the subjective variable scale could be relied upon.

### 4.3. Confirmatory factor analysis (CFA)

After exploratory factor analysis, confirmatory factor analysis (CFA) is used to validate the number of underlying latent variables (factors or constructs) and the pattern of observed variable-factor correlations (Brown, 2015). The loading factor value, which should be 0.50, not 1.00, and must be positive, is the key criterion for determining compatibility (Mustafa et al., 2020). According to Hair et al. (1998), the goodness-of-fit for each model was assessed by examining the chi-square statistic, the comparative fit index (CFI), and the root-mean-square error of approximation (RMSEA) was equal or lower than 0.08 (RMSEA  $\leq$  0.05 is excellent). A value of more than 0.90 suggests an excellent model fit for IFI, TLI, and CFI. Additionally, Hair et al. (1998) figured out that the GFI and AGFI indexes exceeded 0.8. Chi-square/df was equal or lower than 2 (Chi-square/df  $\leq$

**Table 1. Measurement items**

Items	Measures	Source
Understand of COVID 19		
UC1	I do understand the transmission of COVID-19	Liu (2020)
UC2	I do understand the incubation period of COVID-19	Coccia (2020)
UC3	I do understand the symptoms of COVID-19	Li et al. (2020)
UC4	I do understand the protocol if I have symptoms that might lead to COVID-19	Nicola et al. (2020)
Perceived Risk of COVID-19		
PRC1	I am worried the COVID-19 pandemic will last long	Beirman (2006)
PRC2	I think although I am healthy, I still have a chance to spread COVID-19 to others	Beirman (2006)
PRC3	I think the risk of death caused by COVID-19 infection is great	Beirman (2006)
PRC4	I think COVID-19 is highly dangerous	Beirman (2006)
Perceived Behavior Control		
PBC1	The preventive protocols are completely up to me	Sato (2018)
PBC2	I think preventive protocols are easy to be implemented	Shen et al. (2020)
PBC3	I am confident that I can prevent getting infected by COVID-19	Veldhuijzen et al., (2006)
PBC4	I am confident that I enough knowledge about COVID-19	Barati et al. (2020)
Subjective Norm		
SN1	Most people I know are following the preventive protocols given by the government	Centers for Disease Control and Prevention, (2020))
SN2	Most people I know are wearing face masks outside	Coner (2020)2021
SN3	Most people I know are staying at home and work from home.	Yancey-Bragg and Bravo (2020)
SN4	Most people I know are using hand sanitizer	USA Food & Drug Administration (2020)
SN5	Most people I know, are doing physical distancing	Adam (2020)
Attitude		
ATT1	I worry about the number of people infected by COVID-19	Sarkodie and Owusu (2020)
ATT2	I feel stressed during the COVID-19 outbreak	Shader (2020)
ATT3	I am afraid that one of my family members will get infected.	Dariya and Nagaraju (2020)
ATT4	I feel anxious during COVID-19 outbreak.	Roy et al. (2020)
ATT5	I feel insecure if someone stand too close to me during the COVID-19 outbreak	Roy et al. (2020)

(Continued)

**Table 1. (Continued)**

Items	Measures	Source
ATT6	I feel insecure if someone is not wearing a mask during the COVID-19 outbreak	D'Amours (2020)
ATT7	I feel insecure if someone sneezes or coughs next to me	Centers for Disease Control and Prevention, (2020))
Intention to follow		
ITF1	I am willing to follow the recommended precautions until the end of the COVID-19 outbreak	Barati (2020);
ITF2	I am willing to stay at home during COVID-19 outbreak	Sen-Crowe et al. (2020)
ITF3	I am willing to follow every rule made by my government during COVID-19 outbreak	Oyeniran and Chia (2020)
ITF4	I am willing to reschedule my travel plans	Lee et al (2020)
ITF5	I am willing to follow my government to lock down the country, city, and community.	University of Michigan School of Public Health (2020)

**Table 2. Demographics; Characteristics and online shopping behavior of samples**

Category	Number of respondents	Percentage
Gender		
Male	128	41%
Female	193	59%
Age		
Less than 18 years old	11	4%
19–29 years old	141	45%
30–39 years old	69	22%
40–49 years old	48	15%
50–60 years old	34	11%
Above 60 years old	8	3%
Occupation		
Student	140	45%
Financial	72	23%
Education	63	20%
Government	26	9%
Others	10	3%
Education		
Senior High Diploma	41	13%
Associate Bachelor Degree	140	45%
Bachelor Degree	91	29%
Master Degree	39	13%

can be accepted in some cases). The results reflected the threshold of goodness-of-fit indices and its current figures of the model. It was inevitable that the model good of fit is good. All fit indices were satisfied the recommended values: Significant at: Chi-square/df = 2.035; GFI = 0.857; AGFI = 0.829; TLI = 0.933; CFI = 0.940; RMSEMA = 0.058 (see, Table 3).

The prior step was checking reliability; it will then have been followed by a convergent validity check. The following indices represent the convergent validity of each construct. Hair (2007) suggests that AVE's value should be more than 0.5 and factor loadings of each item should be greater than 0.7. Firstly, all factors loading was ranging from 0.641 to 0.920 were high approximately to 0.5. Secondly, AVEs from 0.553 to 0.769 were greater than 0.5. As a result, all factor loadings were greater than 0.5 and AVE' indexes were also higher than 0.5, The convergent validity of all constructs in this study can be acceptable. Table 4 will present factor analysis, Cronbach's Alpha, CR, AVE values.

**4.4. Discriminant validity and correlations**

A comparison should be made between the value of a factor's square root of AVE and its inter-construct correlations with other factors that determine discriminant validity, with the value of square root of AVE being greater. Furthermore, Fornell and Larcker showed that discriminant validity was achieved when the AVE value for any variable exceeds the squared of correlation between that variable and any other variables. As a result, Structural Equation Modeling (SEM) could be carried out once the constructed validity of the variables had been established. Table 5 showed that the lowest AVE (0.553 for PRC) exceeded the highest square root inter-construct correlation (0.0.769 for ITF). As consequences, the measurement model's discriminant validity was found to be satisfactory.

**4.5. Hypothesis testing and result**

The structural equation modeling (SEM) is a sophisticated statistical method for describing causal links between latent variables (Hair et al., 2010; Martinez et al., 2019). One exogenous latent variable (understanding of COVID-19, perceived risk of COVID-19) and nine endogenous latent factors (perceived behavioral control, subjective norms, intention to follow) made up the SEM construct. The SEM was conducted using AMOS 22. From this path diagram, it could be observed that all the statistics for model fit have been met at good or even great degree: Chi-square = 758.451; df = 368; p-value = 0.00; Chi-square/df = 2.061; GFI = 0.854; TLI = 0.931; CFI = 0.938; IFI = 0.938; RMR = 0.063; RMSEA = 0.069. The IFI, TLI, and CFI values were all higher than the proposed threshold of 0.90, suggesting that the hypothesized construct in the given model was a good match for the observed data. Furthermore, the GFI and AGFI values were higher than 0.8, showing that the model was also good. Based on the successful indexes, the research model was acceptable.

Data analysis indicated that understanding of COVID-19 had a significantly positive impact on perceived risk of COVID-19 ( $\beta = 0.438, p < .001$ ). It meant that when people had a higher understanding of COVID-19, their perception about risks related to COVID-19 was higher directly. Thus, H1 is supported. Additionally, perceived risk has significantly positive effects on perceived control behavior ( $\beta = 0.351, p < .001$ ), H2 is also supported in this study. However,

**Table 3. Confirmatory factor analysis**

Measure	Threshold	Study results	Source
Chi-square/df (cmin/df)	≤ 2 good; ≤ sometimes permissible	2.035	Hair et al. (2010)
Goodness of fit index (GFI)	≥ 0.9: acceptable; ≥ 0.8: marginal	0.857	Hair et al. (2010)
Adjusted goodness of fit index (AGFI)	≥ 0.8	0.829	Hair et al. (2010)
Comparative fit index (CFI)	≥0.95 great; ≥0.90 traditional;	0.940	Hair et al. (2010)
Root mean squared error of approximation (RMSEMA)	≥0.80 sometimes permissible	0.058	Hair et al. (2010)
Tucker Lewis Index (TLI)	≥0.9great	0.933	Hair et al. (2010)

**Table 4. Confirmatory factor analysis (CFA) fitting Indices**

Items	Estimate	Cronbach	CR	AVE
Understand of COVID 19		0.915	0.918	0.739
UC1	0.798			
UC2	0.855			
UC3	0.920			
UC4	0.862			
Perceived Risk of COVID-19		0.821	0.831	0.553
PRC1	0.643			
PRC2	0.837			
PRC3	0.733			
PRC4	0.751			
Perceived Behavior Control		0.846	0.850	0.589
PBC1	0.813			
PBC2	0.765			
PBC3	0.837			
PBC4	0.641			
Subjective Norm		0.899	0.902	0.649
SN1	0.683			
SN2	0.866			
SN3	0.812			
SN4	0.882			
SN5	0.772			
Attitude		0.910	0.917	0.618
ATT1	0.709			
ATT2	0.671			
ATT3	0.668			
ATT4	0.784			
ATT5	0.868			
ATT6	0.882			
ATT7	0.885			
Intention to follow		0.944	0.943	0.769
ITF1	0.797			
ITF2	0.887			
ITF3	0.933			
ITF4	0.942			
ITF5	0.817			

this study did not find any positive relationship between perceived risk and subjective norm ( $\beta = 0.065$ ), thus the hypothesis presented this relationship (H3) did not support. Additionally, the positive effect of perceived risk of COVID 19 on attitude was also confirmed in this study ( $\beta = 0.378$ ,  $p < .01$ ), thus H4 was supported. The positive effects of perceived behavior control and attitude on subjective norm were found in this research ( $\beta_{H5} = 0.404$ ,  $p < .001$ ;  $\beta_{H6} = 0.206$ ,  $p < .001$ ); hence, H5 and H6 were also supported. Moreover, within three variables from the TPB model, attitudes had not found any positive effects on intention to follow; while subjective norm and perceived behavior control were found to have the relationship with the

**Table 5. Discriminant validity**

	UC	PRC	PBC	SN	ATT	ITF
UC	0.739					
PRC	0.385	0.553				
PBC	0.126	0.264	0.589			
SN	0.286	0.339	0.237	0.649		
ATT	0.207	0.237	0.430	0.291	0.618	
ITF	0.222	0.283	0.542	0.170	0.440	0.769

intention to follow with positive direct effect. Thus, H7 and H8 were supported while H9 was not supported in this study (see, Table 6).

### 5. Discussion

According to Haleem et al. (2020), COVID-19 has had a tremendous impact on our daily lives, enterprises, and global trade and travel. As a result, the present study combined Protection Motivation Theory (PMT) and broadened Theory of Planned Behavior (TPB) to assess factors that affect the intention to follow the preventative COVID-19 measures in Ho Chi Minh City, Vietnam, during a lockdown time. SEM was utilized to analyze the interrelationship among understanding of COVID-19 (UC), perceived risk (PRC), attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), intention to follow (IIF). A total of 319 data samples were collected using an online questionnaire. The findings of this study revealed that the majority of the hypotheses were valid, which is in line with some of the findings from the study by Gefen et al. (2003); Rahmafritria et al.

**Table 6. Hypothesis testing and result**

Hypotheses	Standardized path coefficient	Result
H1: Understanding COVID 19 has a positive influence on perceived risk of COVID 19	0.438***	Supported
H2: Perceived risk of COVID 19 has a positive impact on perceived control behavior	0.351***	Supported
H3: Perceived risk of COVID 19 has a positive impact on subjective norm	0.065	Unsupported
H4: Perceived risk of COVID 19 has a positive impact on Attitude	0.378**	Supported
H5: Perceived control behavior has a positive impact on subjective norm	0.404***	Supported
H6: Attitude has a positive impact on subject norm	0.206	Supported
H7: Perceived control behavior has a positive impact on intention to follow the preventive measures of COVID-19	0.516***	Supported
H8: Subject norm has a positive impact on intention to follow the preventive measures of COVID-19.	0.220**	Supported
H9: Attitude has a positive impact on intention to follow the preventive measures of COVID-19.	-0.44	Unsupported

N = 249, \*p < .05; \*\*p < .01; \*\*\*p < .001

(2021); Troise et al. (2020), Prasetyo et al. (2020), and Xie et al. (2017). In particular, this study discovered that having a thorough grasp of COVID-19, including the virus's propagation and incubating periods, the procedure to follow if they notice symptoms that could lead to COVID-19, and how COVID-19 patients can be treated, had a positive impact on perceived risk of COVID-19. Moreover, Yancey-Bragg and Bravo (2020) showed risk perception is a critical determinant of the public's willingness to engage in health protective behaviors, which had a positive impact on two dimensions in TPB theory including perceived behavior control and attitude. For instance, in the context of Vietnam, the higher the perceived risk, the higher the amount of perceived behavior control, which is consistent with J.M. Hansen et al. (2018) findings. Additionally, widespread COVID-19 can affect the perception of risk, thereby changing attitudes such as fear and nervousness, which is consistent with the study by Bhati et al. (2020) and Tasci and Soñmez (2019). In contrast to the current findings, Troise et al. (2020) showed no influence of perceived risk of COVID-19 on attitude. On the other hand, in this investigation, the perceived risk of COVID-19 had no positive impact on the subjective norm, which is consistent with the findings of Xie et al. (2017). It can be demonstrated that having a high perceived risk of COVID-19 does not affect people's subjective norms such as social isolation, using hand sanitizer on a regular basis, wearing face masks outside, and so on. Hence, it should emphasize managerial implications in this research because the government or social media providers may have better communication strategies about the risk of COVID-19 to let them feel scared leading to boost Vietnamese residents joining the preventative measures of COVID-19 because according to Yıldırım and Arslan (2020), acceptable levels of risk perception are possible for humans to battle the epidemic successfully. Additionally, perceived behavior control and attitude had been found the positive effect on subjective norm. This is the new finding that contributed to the previous research because most of the previous research looked at the role of the three dimensions of TPB theory as the predictors and outcomes of the other aspects; however, there is a lack of evidence in the relationship between these variables. The finding can be explained that when people have a high attitude and perceived control behavior toward the COVID-19 prevention measures, the subjective norms will increase directly.

In terms of the intention to follow, the current findings confirm Lau et al. (2010) and Prasetyo et al. (2020), in which TPB-derived components were strongly linked with behavioral intention. The findings revealed that perceived behavior control, subjective norm, and attitude had a substantial impact on intention to follow, which has a number of implications. First, persons who are exposed by people who routinely use hand sanitizers, wear a mask, isolate themselves socially, and so on are more likely to follow the suggested precaution during the COVID-19 epidemic, which is the same finding with Prasetyo et al. (2020), Lau et al. (2010) in the context of COVID-19 preventative measures. While the findings were extended to the conclusion by SeaLe et al. (2020) that government-implemented tactics to support the outbreak, such as social separation, could have an impact on the community's well-being. People with full knowledge are thus more inclined to stay at home and cooperate with the country, city, and community's lockdown implementation based on their perceived behavior control, which is the same with Prasetyo et al. (2020) and Jingru et al. (2017). According to the "attitude" variable, those who are concerned about the number of affected people and feeling bad mood are more likely to obey every rule imposed by the government for preventing the outbreak in Vietnam.

## 6. Conclusions

According to the conclusion by Yıldırım and Arslan (2020), the coronavirus 2019 (COVID-19) pandemic has a high fatality rate due to its fast transmission and generates widespread dread, panic, psychosis, tension, distress, and suicide ideation throughout the world. COVID-19 has enforced authorities to take a wide range of restrictive measures such as social distancing, avoiding crowded public places, travel restrictions, imposing quarantine of all arrivals in the country (Yıldırım et al., 2021). From 3 January 2020 to 5:20 pm CEST on 17 September 2021, there were 656,129 confirmed patients of COVID-19 in Vietnam, with 16,425 fatalities recorded to the World Health Organization (WHO). The current study combined Protection Motivation Theory



(PMT) and expanded Theory of Planned Behavior (TPB) to assess variables impacting Vietnamese perceptions of COVID-19 preventive efforts during the country's longest period of social isolation. The valuable data from 319 respondents answered the online questionnaire, which contained 29 questions. The outcomes of this investigation demonstrated that most of the hypotheses were correct, which is consistent with the results of Gefen et al. (2003), Rahmafritra et al. (2021), Troise et al. (2020), Prasetyo et al. (2020), and Xie et al. (2017). First, the results of Structural Equation Modeling (SEM) indicated that understanding of COVID-19 had significant direct effects on perceived risk. Secondly, perceived risk of COVID 19 was influenced by attitude and perceived behavior control, while subjective norms had not been found any positive influences by perceived risk. Particularly, ones who had high perception risk towards COVID-19, their attitude (such as feeling anxious, nervous, and insecure) and perceived behavior control was increased directly. Interestingly, the current study is one of the first studies in Vietnam finding out the relationship between three dimensions of TBP models, in which perceived behavior control and attitude have a positive impact on subjective norm. Finally, the indicators from the TPB model were used to assess the intention to pursue COVID-19 measures in Vietnam, which is effectively dealing with the epidemic. In which, subjective norms and perceived behavior control were the potential predictor for the intention to follow the COVID-19 measures, while attitude did not find any significant insights. It can be explained that subjective norms such as wearing face masks, staying at home by most Vietnamese residents may lead people to participate in COVID-19 measures, such as remaining at home, avoiding public gatherings, preserving physical and social distance, and maintaining personal hygiene because they were impacted by the surrounding community. Moreover, when people feel confident about preventing for getting infected as well as getting enough knowledge about COVID-19, their intention to follow the measures by Government and community will increase as well.

This study's findings have a wide range of implications in both research and practice. In terms of theoretical contribution, the current research developed and evaluated a conceptual model based on the extended theory of planned behavior and Protection Motivation Theory (PMT) in order to determine which variables influenced the intention to follow the COVID-19 measures in Vietnam. Moreover, this research is one of the first empirical studies in Vietnam during the outbreak of COVID-19 to perceived risk and three dimensions from TPB models, namely attitude, subjective norm, perceived behavior control. It also had found the positive effect of attitude and perceived behavior control on subjective norm, which contributed more deep insights about this theory from previous research. This study not only has theoretical contributions but also have the managerial implications. First, the government, as well as other stakeholders, must inform the public about COVID-19 more seriously and its detailed preventative measures because this study found that perceived risk of COVID 19 had no positive impact on the subjective norm. In addition, it is necessary to carry out more epidemic prevention campaigns calling for celebrities to participate in order to increase the possibility of spreading the message. Moreover, epidemiologists need to plan detailed and well-informed preventive protocols to the public because perceived behavioral control has a direct impact on these intentions to follow.

Despite the evident and significant contributions, the authors would like to point out some of the study's drawbacks. First, instead of measuring the efficiency of prevention strategies, the current study focused on the intention to follow. Thus, the future studies examining the relationship between perceived effectiveness and the number of instances would be quite interesting. Moreover, the data is still collected in Vietnam and during the COVID-19 epidemic, also the respondents cannot be represented for all the community.

**Funding**

The authors received no direct funding for this research.

**Author details**

Duc Trung Nguyen<sup>1</sup>

E-mail: [trungnd@buh.edu.vn](mailto:trungnd@buh.edu.vn)

Van Dat Tran<sup>2</sup>

E-mail: [dattv@buh.edu.vn](mailto:dattv@buh.edu.vn)

Abdul Ghafoor<sup>3</sup>

E-mail: [ghafoor@uaf.edu.pk](mailto:ghafoor@uaf.edu.pk)

- <sup>1</sup> Faculty of Finance and Banking Ho Chi Minh University of Banking, Vietnam.
- <sup>2</sup> Marketing Department, Ho Chi Minh University of Banking, Vietnam.
- <sup>3</sup> Faculty of Social Science Institute of Business Management Sciences, University of Agriculture Faisalabad, Pakistan.

### Disclosure statement

No potential conflict of interest was reported by the author(s).

### Citation information

Cite this article as: The Impact of Covid-19 lockdown on Intention to Follow Preventive Measures in Vietnam: Integrated Protection Motivation Theory and Theory Planned Behavior, Duc Trung Nguyen, Van Dat Tran & Abdul Ghafoor, *Cogent Business & Management* (2022), 9: 2054502.

### References

- Adam, D. (2020). *The effects of physical isolation on the pandemic quantified*. The Scientist Exploring Life Inspiring Innovation . <https://www.the-scientist.com/news-opinion/the-effects-of-physical-isolation-on-the-pandemic-quantified-67407>
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 11–39). Springer.
- Akinbode, S. O., Dipeolu, A. O., Bolarinwa, T. M., & Olukowi, O. B. (2021). Effect of health outcome on economic growth in sub-Saharan Africa: A system generalized method of moment approach. *Journal of Economics and Development*, 23(3), 254–266. <https://doi.org/10.1108/JED-06-2020-0078>
- Al-Jubari, I., Hassan, A., & Liñán, F. (2019). Entrepreneurial intention among University students in Malaysia: Integrating self-determination theory and the theory of planned behavior. *International Entrepreneurship and Management Journal*, 15(4), 1323–1342. <https://doi.org/10.1007/s11365-018-0529-0>
- Anderson, C. L., & Agarwal, R. (2010). Practicing safe computing: A multimedia empirical examination of home computer user security behavioral intentions. *MIS Quarterly*, 34(3), 613–643. <https://doi.org/10.2307/25750694>
- Ansari, M. A., Haider, S., and Masood, T. (2021). Do renewable Energy and Globalization Enhance Ecological Footprint: an Analysis of Top Renewable Energy Countries? *Environment Science Pollution Research*, 28 (6), 6719–6732. doi:10.1007/s11356-020-10786-0
- Asnakew, Z., & Kerebih Asrese, M. A. (2020). Community risk perception and compliance with preventive measures for COVID-19 pandemic in Ethiopia. *Risk Management and Healthcare Policy*, 13 (4) , 2887–2897. <https://doi.org/10.2147/RMHP.S279907>
- Bae, S. Y., & Chang, P. (2020). The effect of coronavirus disease-19 (COVID-19) risk perception on behavioral intention towards 'untact' tourism in South Korea during the first wave of the pandemic. *Current Issues in Tourism* , 24 (7) 1017–1035, <https://doi.org/10.1080/13683500.2020.1798895> .
- Beirman, D. (2006). A travel industry perspective on government travel advisories. In J. Wilks, D. Pendergast, & P. Leggat (Eds.), *Tourism in turbulent times towards safe experiences for visitors* (pp. 309–322). Elsevier.
- Black, G. (2020). *Vietnam may have the most effective response to covid-19* The National, . Retrieved 14 September 2021, from <https://www.thenation.com/article/world/coronavirus-vietnam-quarantine-mobilization/>
- Bockarjova, M., & Steg, L. (2014). Can protection motivation theory predict proenvironmental behavior? Explaining the adoption of electric vehicles in the Netherlands. *Global Environmental Change*, 28 (1) , 276–288. <https://doi.org/10.1016/j.gloenvcha.2014.06.010>
- Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). Guilford.
- Bulgurcu, B., Cavusoglu, H., & Benbasat, I. (2010). Information security policy compliance: An empirical study of rationality-based beliefs and information security awareness. *MIS quarterly*, 34 (3) . 523–548 <https://doi.org/10.2307/25750690>.
- Buschle, C., Reiter, H., & Bethmann, A. (2021). The qualitative pretest interview for questionnaire development: Outline of programme and practice. *Quality & Quantity* 56 (2) . CrossRef. <https://doi.org/10.1007/s11135-021-01156-0>
- Cascella, M., Rajnik, M., Cuomo, A., Dulebohn, S.C, Di Napoli, R et al. (2020). *Features, evaluation and treatment coronavirus (COVID-19)*. Retrieved 03 September, 2021, <https://www.ncbi.nlm.nih.gov/books/NBK554776/>. StatPearls Publishing
- Centers for Disease Control and Prevention. (2020). Retrieved 17 September, 2021, from [https://www.cdc.gov/healthywater/hygiene/etiquette/coughing\\_sneezing.html](https://www.cdc.gov/healthywater/hygiene/etiquette/coughing_sneezing.html)
- Chan, M., Woon, I., & Kankanhalli, A. (2005). Perceptions of information security in the workplace: Linking information security climate to compliant behavior. *Journal of Information Privacy and Security*, 1(3), 18–41. <https://doi.org/10.1080/15536548.2005.10855772>
- Cho, H., & Lee, J. -. S. (2015). The influence of self-efficacy, subjective norms, and risk perception on behavioral intentions related to the H1N1 flu pandemic: A comparison between Korea and the US. *Asian Journal of Social Psychology*, 18(4), 311–324. <https://doi.org/10.1111/ajsp.12104>
- Coccia, M. (2020). Factor determining the diffusion of Covid-19 and suggested strategy to prevent future accelerated viral infectivity similar to Covid. *Science of the Total Environment*, 729, 138474. <https://doi.org/10.1016/j.scitotenv.2020.138474>
- Coner, S. (2021). People wearing face masks outside during the coronavirus pandemic in the UK 2020/21. Statista. <https://www.statista.com/statistics/1114248/wearing-a-face-mask-outside-in-the-uk/>
- Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology*, 28(15), 1429–1464. <https://doi.org/10.1111/j.1559-1816.1998.tb01685.x>
- D'Amours, K. (2020). Stop the spread of COVID-19 by wearing your face mask properly Hampden County <https://www.wvlp.com/news/health/coronavirus-local-impact/combat-covid-19-spread-by-wearing-your-face-mask-properly/>
- Dao, T. L., & Nguyen, T. D. (2020). Controlling the COVID-19 pandemic: Useful lessons from Vietnam. *Travel Medicine and Infectious Disease*, 37 (2) , 101822. <https://doi.org/10.1016/j.tmaid.2020.101822>. CrossRef.
- Dariya, B., & Nagaraju, G. P. (2020). Understanding novel COVID-19: Its impact on organ failure and risk assessment for diabetic and cancer patients. *Cytokine & Growth Factor Reviews*, 53 (3) , 43–52. <https://doi.org/10.1016/j.cytogfr.2020.05.001>

- Dongming, W. (2020). Empirical study of knowledge withholding in cyberspace: Integrating protection motivation theory and theory of reasoned behavior. *Computers in Human Behavior* 105 (4), 106229. <https://doi.org/10.1016/j.chb.2019.106229>.
- Floyd, D. L., Prentice-Dunn, S., & Rogers, R. W. (2000). A meta-analysis of research on protection motivation theory. *Journal of Applied Social Psychology*, 30(2), 407–429. <https://doi.org/10.1111/j.1559-1816.2000.tb02323.x>
- Foroudi, P., Tabaghdehi, S. A. H., & Marvi, R. (2021). The gloom of the COVID-19 shock in the hospitality industry: A study of consumer risk perception and adaptive belief in the dark cloud of a pandemic. *International Journal of Hospitality Management*, 92, 102717. <https://doi.org/10.1016/j.ijhm.2020.102717>
- Fosu, P., & Ankrah Twumasi, M. (2021). The effect of government expenditure and free maternal health care policy (FMHC) on household consumption in Ghana. *Journal of Economics and Development*, 23(2), 184–202. <https://doi.org/10.1108/JED-07-2020-0088>
- Gefen, D., Karahanna, E., & Straub, D. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27 (1), 51–90. <https://doi.org/10.2307/30036519>
- Gohel, K. H., Patel, P. B., Shah, P. M., Patel, J. R., Pandit, N., & Raut, A. (2020). Knowledge and perceptions about COVID-19 among the medical and allied health science students in India: An online cross-sectional survey. *Clinical Epidemiology and Global Health* 9 (2), 104–109. doi:10.16j.cegh.2020.07.008 .
- Hagger, M. S., Smith, S. R., Keech, J. J., Moyers, S. A., & Hamilton, K. (2020). Predicting social distancing intention and behavior during the COVID-19 pandemic: An integrated social cognition model. *Annals of Behavioral Medicine*, 54(10), 713–727. <https://doi.org/10.1093/abm/kaaa073>
- Hair, J. F. (2007). Research methods for business. *Education + Training*, 49(4), 336–337. <https://doi.org/10.1108/et.2007.49.4.336.2>
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2010). *Multivariate data analysis* (6th ed.). Prentice-Hall.
- Hair, J. F., Tatham, R. L., Anderson, R. E., & Black, W. (1998). *Multivariate data analysis* (5th ed.). Prentice-Hall.
- Haleem, A., Javaid, M., & Vaishya, R. (2020). Effects of COVID-19 pandemic in daily life. *Current Medicine Research and Practice*, 10(2), 78. <https://doi.org/10.1016/j.cmrp.2020.03.011>
- Hansen, T., Jensen, J. M., & Solgaard, H. S. (2004). Predicting online grocery buying intention: A comparison of the theory of reasoned action and the theory of planned behavior. *International Journal of Information Management*, 24(6), 539–550. <https://doi.org/10.1016/j.ijinfomgt.2004.08.004>
- Hansen, J. M., Saridakis, G., & Benson, V. (2018). Risk, trust, and the interaction of perceived ease of use and behavioral control in predicting consumers' use of social media for transactions. *Computers in Human Behavior*, 80, 197–206. <https://doi.org/10.1016/j.chb.2017.11.010>
- Janmaimool, P. (2017). Application of protection motivation theory to investigate sustainable waste management behaviors. *Sustainability*, 9(7), 1079. <https://doi.org/10.3390/su9071079>
- Jingru, L., Zuo, J., Cai, H., & Zillante, G. (2017). Construction waste reduction behavior of contractor employees: An extended theory of planned behavior model approach. *Journal of Cleaner Production* 172, 1399–1408 <https://doi.org/10.1016/j.jclepro.2017.10.138> .
- Johnson, E., & Hariharan, S. (2017). Public health awareness: Knowledge, attitude and behaviour of the general public on health risks during the H1N1 influenza pandemic. *Journal of Public Health*, 25(3), 333–337. <https://doi.org/10.1007/s10389-017-0790-7>
- Kim, M., Lee, J. Y., Park, J. S., Kim, H. A., Hyun, M., Suh, Y.-S., Nam, S. I., Chung, W. J., & Cho, C.-H. (2020). Lessons from a COVID-19 hospital. *Bulletin of the World Health Organization*, 98 (12), 842–848. Republic of Korea. <https://doi.org/10.2471/BLT.20.261016>
- Laato, S., Islam, A. K. M. N., Farooq, A., & Dhir, A. (2020). Unusual purchasing behavior during the early stages of the COVID-19 pandemic: The stimulus-organism-response approach. *Journal of Retailing and Consumer Services*, 57, 102224. <https://doi.org/10.1016/j.jretconser.2020.102224>
- Lau, J. T., Yeung, N. C., Choi, K. C., Cheng, M. Y., Tsui, H. Y., & Griffiths, S. (2010). Factors in association with acceptability of A/H1N1 vaccination during the influenza A/H1N1 pandemic phase in the Hong Kong general population. *Vaccine*, 28(29), 4632–4637. <https://doi.org/10.1016/j.vaccine.2010.04.076>
- Le, T. A. T., Vodden, K., Wu, J., & Atiwesh, G. (2020). Policy responses to the COVID-19 pandemic in Vietnam. *International Journal of Environmental Research and Public Health*, 18(2), 559. <https://doi.org/10.3390/ijerph18020559>
- Lee, M. C. (2009). Factors influencing the adoption of Internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electronic Commerce Research and Applications*, 8(3), 130–141. <https://doi.org/10.1016/j.elerap.2008.11.006>
- Lee, Y. (2011). Understanding anti-plagiarism software adoption: An extended protection motivation theory perspective. *Decision Support Systems*, 50(2), 361–369. <https://doi.org/10.1016/j.dss.2010.07.009>
- Lin, H. F. (2007). Predicting consumer intentions to shop online: An empirical test of competing theories. *Electronic Commerce Research and Applications*, 6(4), 433–442. <https://doi.org/10.1016/j.elerap.2007.02.002>
- Liu, L. (2020). Emerging study on the transmission of the Novel Coronavirus (COVID-19 from urban perspective: Evidence from China. *Cities* 103 . 102759 <https://doi.org/10.1016/j.cities.2020.102759>.
- Martinez, J. E., Prasetyo, Y. T., Robielos, R. A., Panopio, M. M., Urlanda, A. A., & Manalaysay KAC, T. (2019). The Usability of Metropolitan Manila Development Authority (MMDA) mobile traffic navigator as perceived by users in Quezon City and Mandaluyong City, Philippines. *Proceedings of the 2019 5th International conference on Industrial and Business Engineering – ICIBE*.
- McDonald, H., & Adam, S. (2003). A comparison of online and postal data collection methods in marketing research. *Marketing Intelligence and Planning*, 21(2), 85–95. <https://doi.org/10.1108/02634500310465399>
- Ministry of Health General information for quick response of national steering committee for epidemic Covid-19 prevention. (2021). Retrieved 03 September, 2021, from <https://ncov.vncdc.gov.vn/>
- Mustafa, M. B., Nordin, M. B., & Razzaq, A. B. A. (2020). Structural equation modelling using AMOS: Confirmatory factor analysis for taskload of special education integration program teachers. *Journal of Education Research*, 8(1), 127–133 doi:10.13189/ujer.2020.080115.
- Nam, V. *WHO Coronavirus Disease (COVID-19) Dashboard With Vaccination Data* World Health Organization .

- (2021). Retrieved 19 September 2021, from <https://covid19.who.int/region/wpro/country/vn>
- Nguyen, T. T., & Nguyen, V. C. (2021). Financial development and renewables in Southeast Asian Countries—The role of organic waste materials. *Sustainability*, 13(16), 8748. <https://doi.org/10.3390/su13168748>
- Nguyen, T. T., Nguyen, V. C., & Tran, T. N. (2020). Oil price shocks against stock return of oil and gas-related firms in the economic depression: A new evidence from a copula approach. *Cogent Economics & Finance*, 8(1), 1799908. <https://doi.org/10.1080/23322039.2020.1799908>
- Nicola, M., O'Neill, N., Sohrabi, C., Khan, M., Agha, M., & Agha, R. (2020). Evidence based management guideline for the COVID-19 pandemic-Review article. *International Journal of Surgery*, 77, 206–216. <https://doi.org/10.1016/j.ijssu.2020.04.001>
- Norman, P., Wilding, S., & Conner, M. (2020). Reasoned action approach and compliance with recommended behaviours to prevent the transmission of the SARS-CoV-2 virus in the UK. *British Journal of Health Psychology*, 25(4), 1006–1019. <https://doi.org/10.1111/bjhp.12474>
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.
- Oyeniran, O. I., & Chia, T. (2020). Novel coronavirus disease 2019 (COVID-19) outbreak in Nigeria: How effective are government interventions? *Ethics, Medicine, and Public Health*, 14, 100515. <https://doi.org/10.1016/j.jemep.2020.100515>
- Paital, B., & Agrawal, P. K. Air pollution by NO<sub>2</sub> and PM<sub>2.5</sub> explains COVID-19 infection severity by overexpression of angiotensin-converting enzyme 2 in respiratory cells: A review. (2021). *Environmental Chemistry Letters*, 19(1), 25–42. CrossRef. <https://doi.org/10.1007/s10311-020-01091-w>
- Pelman, S. Another decade, another coronavirus. (2020). *The New England Journal of Medicine*, 382(8), 760–762. CrossRef. <https://doi.org/10.1056/NEJMe2001126>
- Piroth, P., Ritter, M. S., & Rueger-Muck, E. (2020). Online grocery shopping adoption: Do personality traits matter? *British Food Journal*, 122(3), 957–975. <https://doi.org/10.1108/BFJ-08-2019-0631>
- Prasetyo, Y. T., Castillo, A. M., Salonga, L. J., Sia, J. A., & Seneta, J. A. (2020). Factors affecting perceived effectiveness of COVID-19 prevention measures among Filipinos during enhanced community quarantine in Luzon, Philippines: Integrating protection motivation theory and extended theory of planned behavior. *International Journal of Infectious Diseases*, 99, 312–323. <https://doi.org/10.1016/j.ijid.2020.07.074>
- Prentice-Dunn, S., & Rogers, R. W. (1986). Protection motivation theory and preventive health: Beyond the health belief model. *Health Education Research*, 1(3), 153–161. <https://doi.org/10.1093/her/1.3.153>
- Rahmafritra, F., Suryadi, K., Oktadiana, H., Putro, H. P. H., & Rosyidie, A. (2021). Applying knowledge, social concern and perceived risk in planned behavior theory for tourism in the Covid-19 pandemic. *Tourism Review*, 76(4), 809–828. *Tourism Review*. <https://doi.org/10.1108/TR-11-2020-0542>
- Rogers, R. W., & Prentice-Dunn, S. (1997). Protection motivation theory. In D. S. Gochman (Ed.), *Handbook of health behavior research I: Personal and social determinants* (pp. 113–132). Plenum.
- Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., & Kaushal, V. (2020). Study of knowledge, attitude, anxiety and perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry*, 51, 102083. <https://doi.org/10.1016/j.ajp.2020.102083>
- Sarkodie, S. A., & Owusu, P. A. (2020). Investigating the cases of novel coronavirus disease (COVID-19) in China using dynamic statistical techniques. *Heliyon*, 6(4), e03747. <https://doi.org/10.1016/j.heliyon.2020.e03747>
- Sato, A. P. S. (2018). What is the importance of vaccine hesitancy in the drop of vaccination coverage in Brazil? *Revista de saude publica*, 52, 96. <https://doi.org/10.11606/S1518-8787.2018052001199>
- Sen-Crowe, B., McKenney, M., & Elkbuli, A. (2020). Social distancing during the COVID-19 pandemic: Staying home save lives. *The American Journal of Emergency Medicine*, 38(7), 1519–1520. <https://doi.org/10.1016/j.ajem.2020.03.063>
- Shader, R. I. (2020). COVID-19 and Depression. *Clinical Therapeutics*, 42(6), 962–963. <https://doi.org/10.1016/j.clinthera.2020.04.010>
- Shen, K., Yang, Y., Wang, T., Zhao, D., Jiang, Y., Jin, R., ... Gao, L. (2020). Diagnosis, treatment, and prevention of 2019 novel coronavirus infection in children: Experts' consensus statement. *World Journal of Pediatrics*, 16(3), 223–231. <https://doi.org/10.1007/s12519-020-00343-7>
- Sitkin, S. B., & Weingart, L. R. (1995). Determinants of risky decision-making behaviour: A test of the mediating role of risk perceptions and propensity. *Academy of Management Journal*, 38(6), 1573–1592. <https://doi.org/10.2307/256844>
- Starfelt Sutton, L. C., & White, K. M. (2016). Predicting sun-protective intentions and behaviours using the theory of planned behaviour: A systematic review and meta-analysis. *Psychology & Health*, 31(11), 1272–1292. <https://doi.org/10.1080/08870446.2016.1204449>
- Taber, K. S. The use of cronbach's alpha when developing and reporting research instruments in science education. (2018). *Research in Science and Technological Education*, 48(6), 1273–1296. CrossRef. <https://doi.org/10.1007/s11165-016-9602-2>
- Tasci, A. D., & So'nmmez, S. (2019). Lenient gun laws, perceived risk of gun violence, and attitude towards a destination. *Journal of Destination Marketing and Management*, 13, 24–38. <https://doi.org/10.1016/j.jdmm.2019.03.007>
- Temkin, N. (2009, June). *Engage Gen Y online with social interactivity*. Forrester.
- Troise, C., O'Driscoll, A., Tani, M., & Prisco, A. (2020). Online food delivery services and behavioural intention—a test of an integrated TAM and TPB framework. *British Food Journal*, 123(2), 664–683. <https://doi.org/10.1108/BFJ-05-2020-0418>
- University of Michigan School of Public Health. (2020) <https://sph.umich.edu/news/2020posts/mass-cancellations-slowing-the-spread-and-flattening-the-curve.html>
- USA Food & Drug Administration (2020). <https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-continues-ensure-availability-alcohol-based-hand-sanitizer-during>
- Veldhuijzen, D. S., Kenemans, J. L., de Bruin, C. M., Olivier, B., & Volkerts, E. R. (2006). Pain and attention: Attentional disruption or distraction? *The Journal of Pain*, 7(1), 11–20. <https://doi.org/10.1016/j.jpain.2005.06.003>
- Warkentin, M., Gefen, D., Pavlou, P. A., & Rose, G. M. (2002). Encouraging citizen adoption of e-government by building trust. *Electronic Markets*, 12(3), 157–162. <https://doi.org/10.1080/101967802320245929>

- WHO. (2020). *Coronavirus disease (COVID-19) pandemic 2020*. Retrieved 03 September, 2021, from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
- Wise, T., Zbozinek, T. D., Michelini, G., Hagan, C. C., & Mobbs, D. (2020). Changes in risk perception and protective behavior during the first week of the COVID-19 pandemic in the United States. *Royal Society Open Science*, 7, 20742. <https://doi.org/10.31234/osf.io/dz428>.
- Xie, Q. J., Song, W., Peng, X. B., & Shabbir, M. (2017). Predictors for e-government adoption: Integrating TAM, TPB, trust and perceived risk. *The Electronic Library*, 35(1), 2–20. <https://doi.org/10.1108/EL-08-2015-0141>
- Yancey-Bragg, N., & Bravo, V. (2020). *Can I still go for a walk, run under stay at home orders? Should I wear a mask?*. USA Today News. Retrieved 17 September, 2021, from <https://www.usatoday.com/in-depth/news/health/2020/04/15/coronavirus-masks-how-safely-go-outside-during-stay-home-order/2970072001/>
- Yıldırım, M., & Arslan, G. (2020). Exploring the associations between resilience, dispositional hope, preventive behaviours, subjective well-being, and psychological health among adults during early stage of COVID-19. *Current Psychology*, 1 (1) , 1–11. <https://doi.org/10.1007/s12144-020-01177-2>
- Yıldırım, M., Geçer, E., & Akgül, Ö. (2021). The impacts of vulnerability, perceived risk, and fear on preventive behaviours against COVID-19. *Psychology, Health & Medicine*, 26(1), 35–43. <https://doi.org/10.1080/13548506.2020.1776891>
- Yıldırım, M., & Güler, A. (2020). Factor analysis of the COVID-19 perceived risk scale: A preliminary study. *Death Studies*. Epub ahead of print 24 Jun. , 1–8 <https://doi.org/10.1080/07481187.2020.1784311>.
- Yoh, E., Damhorst, M. L., Sapp, S., & Laczniak, R. (2003). Consumer adoption of the Internet: The case of apparel shopping. *Psychology and Marketing*, 20(12), 1095–1118. <https://doi.org/10.1002/mar.10110>
- 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, 104660. <https://doi.org/10.1016/j.resconrec.2019.104660>



© 2022 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.

You are free to:

Share — copy and redistribute the material in any medium or format.

Adapt — remix, transform, and build upon the material for any purpose, even commercially.

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made.

You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

No additional restrictions

You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.



**Cogent Business & Management (ISSN: 2331-1975) is published by Cogent OA, part of Taylor & Francis Group.**

**Publishing with Cogent OA ensures:**

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

**Submit your manuscript to a Cogent OA journal at [www.CogentOA.com](http://www.CogentOA.com)**

