

# University students' entrepreneurial intentions during COVID-19: The perspective of social cognitive career theory

Suwaluck Uansa-ard<sup>1</sup>, Wisuwat Wannamakok<sup>2</sup> 

## Abstract

**PURPOSE:** Although the COVID-19 pandemic has had a catastrophic effect on economic activities worldwide, the paradoxical phenomenon of this black swan situation may be found to facilitate entrepreneurial intentions. This study aims to investigate Thai university students' perceptions of their entrepreneurial aspirations during the times of the COVID-19 pandemic. **METHODOLOGY:** Drawing upon social cognitive career theory, this research investigates the profound linkage of university students' COVID-19 perceptions and attitudes towards situations for self-believing in the adaptation for entrepreneurship. A valid sample of 798 collected from eight provinces, eight districts, and eight cities throughout Thailand was included for further analysis using Structural Equation Modelling (SEM) and Process Macro Model 6. **FINDINGS:** University students' COVID-19 pandemic perceptions influence their self-efficacy in situation adaptations and perceived desirability towards individual-level entrepreneurial intentions. Interestingly, self-efficacy and desirability towards entrepreneurship act as serial mediating factors, towards the mediated relationship between attitude towards the situation, COVID-19 perception, and university students' entrepreneurial intentions. **IMPLICATIONS:** The results of this research can add to entrepreneurship literature and additional model testing has also been proposed. Besides, practitioners and researchers could collaborate with governors to cultivate entrepreneurial trajectories based on research findings. **ORIGINALITY AND VALUE:** Social cognitive career theory (SCCT) can rationalize an academic student's career choice of entrepreneurship by considering their perception of the start-up processes during COVID-19. Future research can also test findings on a representative sample at the national level.

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**Keywords:** COVID-19, entrepreneurial intentions, self-efficacy, attitude, situation, desirability, social cognitive career theory

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## INTRODUCTION

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In the past decades, the global business ecosystem and economic development have been challenged by periodic black swan events that later became familiar forms, such as SARS, Spanish flu, and even the mystery of Syphilis (Cartwright, 2014). Based on the work of Nassim Nicholas Taleb, a black swan event refers to an unpredictable situation that no one can foresee or prepare for. The black swan term can be more understood following the different deductive logic that all observed swans are white. This does not refer to that all of them are always white (Taleb, 2007). It can be implied by the emergence of COVID-19, which has been an exogenous shock to affect economies and society in unprecedented ways, and humans have not prepared for it. This global health disaster was initially discovered in late 2019 and caused a fully-fledged economic and social crisis (Wannamakok, Sissokho, & Gates, 2020). This humanitarian pandemic is a most serious catastrophe, affecting almost all parts of the globe (Hall, Scott, & Gössling, 2020). Although the COVID-19 crisis affects the economy at large, entrepreneurial spirits and activities could be the key drivers to mitigating the effects of disastrous crises, social instability, and unemployment rates (Zamrudi & Yuliantu, 2020). As a result, governments all over the world have been encouraging drastic measures and cultivating individuals' entrepreneurial mindsets to respond to unexpected crises innovatively (Ratten, 2021).

General speaking, although entrepreneurial intentions are recognized as having a central role in entrepreneurship studies (Linan & Fayolle, 2015), most current studies have widely investigated entrepreneurial activities and little is known in the context of individuals' states of mind in the entrepreneurial processes (e.g., Liñán & Jaén, 2020; Ratten, 2020). How individuals' entrepreneurial intentions could influence their perceptions of the COVID-19 pandemic should be further studied (Liñán & Jaén, 2020; Krichen & Chaabouni, 2021). Previous studies have postulated that entrepreneurial processes and trajectories could be affected by uncertain and risky circumstances (Amorós et al., 2019). Particularly, how an individual's entrepreneurial aspiration could be affected by their subjective perceptions during the COVID-19 pandemic are unexplored (Hernández-Sánchez, Cardella & Sánchez-García, 2020). Although this exogenous shock could cause entrepreneurial activities to teeter on the verge of a rapid decline, it

also allows individuals to cope with this crisis with resilience and innovative creation (Anker, 2021).

Drawing upon the social cognitive career theory proposed by Bandura (1978), self-efficacy in adaptation contingent on the situation is the germane premise of the theory especially when predicting individuals' entrepreneurial intentions. When individuals possess high self-efficacy, their level of self-confidence to perform a particular action is higher (Shahab, Chengang & Arbizu, 2019). It is also in line with Liñán and Chen's (2009) research work. They found and confirmed that self-efficacy arouses individuals to be more confident in their entrepreneurial decisions. Individuals may exercise stronger muscles of resilience and recognize new opportunities that emerge from today's pandemic-filled business ecosystem (Liguori & Pittz, 2020). In this line of thought, individuals may view the COVID-19 pandemic crisis as an opportunity in the pursuit of their entrepreneurial intentions, particularly those who are in educational institutions. This is because academic students considered the COVID-19 crisis as an opportunity for an enterprising career, particularly those who perceived risk situations as negative for their entrepreneurial propensity and consider entrepreneurship as a future career choice through the educational support in university (Krichen & Chaabouni, 2021).

In this sense, we explore how university students' COVID-19 perceptions and attitudes towards the current situation influence self-efficacy and perceived desirability to determine their entrepreneurial intentions. This research question is essential because it could help improve the existing education and entrepreneurship policies, boost academic students' intentions to engage in entrepreneurship during COVID-19, and bring about positive change to society at large. This paper could also contribute to the current literature on entrepreneurial intentions by exploring the concurrence effects of COVID-19 and the serial mediating roles of self-efficacy and perceived desirability towards entrepreneurial propensity on university students' entrepreneurial intentions. Our work could also broaden the abovementioned understanding and help future research in conceptualizing the underlying entrepreneurial intentions research area.

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## LITERATURE REVIEW

### Social cognitive career theory

Based on the intention model theorists, Ajzen's (1991) Theory of Planned Behavior (TPB) and Shapero's (1982) model of how entrepreneurial events could enhance individuals' entrepreneurial intentions. TPB provides three

determinants of pre-enterprise intentions (attitude towards behavior, subjective norms, and perceived behavior control). Meanwhile, Shapero's (1982) model of the entrepreneurial event also provides three antecedents (perceived feasibility, perceived desirability, and propensity to act). These two theoretical models have been widely adopted to examine enterprising spirits in the entrepreneurial intention literature. Besides, both entrepreneurial intention models by Ajzen (1991) and Shapero (1982) also agree on the way perceived desirability and feasibility can influence entrepreneurial intentions. In this sense, perceived desirability is an individual's attitude that is influenced by personal expected values. Whereas, perceived feasibility, refers to the degree of individuals' self-confidence and capability of launching a business. This self-confidence perception is in line with the main premise of Bandura's (1978) social cognitive theory on perceived self-efficacy that could explain how individuals' inners on their self-belief to effectively perform a behavior. As a result, this study incorporates the above-mentioned two intentions models with Bandura's (1978) self-efficacy to further examine individuals' entrepreneurial intentions in the context of the COVID-19 situation accordingly. Based on this line of thought, individuals' entrepreneurial intentions could be explained by cognitive perceptions for business information evaluation to become entrepreneurs (Krueger, 1993).

In the present study, we, therefore, draw upon the social cognitive career theory (SCCT) to rationalize an individual's career choice of entrepreneurship by considering their perception of the start-up processes. SCCT is based on individuals' cognition awareness of their self-belief, which is crucial for tenacious goal pursuits and intentions. Thus, individuals are cognitively prone to shape their intentions based on the expectations of their efforts for future outcomes (Liguori, Bendickson, & McDowell, 2018). Caines, Earl, and Bordia (2019) suggested that self-efficacy has a positive influence on an individual's self-employment. Individuals would engage in entrepreneurial activities when they believe they are capable of handling the complicated and uncertain processes of founding a new venture (Lent, Brown & Hackett, 2000). However, the close connections between self-efficacy and entrepreneurial aspirations are still inconclusive in the COVID-19 context.

Looking at the wider picture of the connection between the industries and current situation, Seetharaman (2020) found that individuals in the industries who have agilely adapted to the current situation could seek business opportunities and foster businesses to have an altered or new business model for their future survival outcomes. Individuals will be more resilient to the COVID-19 pandemic situation and may be able to perceive new opportunities (Liguori & Pittz, 2020). Meanwhile, individuals' risk evaluation, attitude towards situations, and failure could be the main suppressors of

their career choices. This view is in line with the work of Lent et al. (2000), who postulated that starting a new business involves dealing with risks and uncertainties that may stifle an individual's passion for entrepreneurship. However, the premises of SCCT and other contributing factors could jointly reinforce individuals' commitment to their career choice through the lens of cognitive determinants (Lent, Brown & Hackett, 2002), particularly in the times of COVID-19 that may drive individuals to adapt and foster entrepreneurship (Krichen & Chaabouni, 2021).

These health-related behaviors and outcomes could affect personal assessments of a taxing situation, and thus, self-efficacy is the main trigger in predicting physical and psychological health (Bandura, 1978). Besides, self-efficacy has been associated with or included in entrepreneurship and psychological health studies. For example, self-efficacy has been found to have a profound effect on the relationship between personal representations and physical health (Knowles et al., 2020), psychological health (Karademas & Thomadakis, 2021), individual's quality of life (Banik et al., 2018), and entrepreneurial behavior in the times of COVID-19 (Doanh et al., 2021). This pandemic is a demanding condition that could affect their adaptive abilities (Karademas & Thomadakis, 2021), Bandura's (1978) theory thus reflected a personal self-efficacy perception for their adaptation to the COVID-19 pandemic. Therefore, this research clarifies how individuals' entrepreneurial intentions are driven by self-efficacy, attitude towards the situation, and COVID-19 perceptions including perceived desirability towards entrepreneurship that may jointly strengthen their motivation and serve as precursors of potential entrepreneurs.

### **Entrepreneurship in times of pandemic**

Bandura's work (1978) has elucidated that self-efficacy dramatically led to personal opportunity, which is persuasive for future expected outcomes. In this sense, individuals who possess self-efficacy, resilience, and innovativeness are more likely to create a business opportunity that thrives within a short period. Brown, Beale, and White-Johnson (2011) confirmed that individuals' attitudes towards entrepreneurship are influenced by their self-efficacy, self-reliance, and risk-taking tendencies. Individuals could even create a new type of venture contingent upon opportunity/necessity entrepreneurial mindsets (Maritz, Perenyi, De Waal, & Buck, 2020). When the business environment is highly uncertain, individuals could be more proactive and perceive the advantages of the positive facets of this environment (Hernández-Sánchez et al., 2020). These emerging opportunities are formulated through an individual's perceived self-efficacy, intention, and desirability (Hostager, 1998). This

view is confirmed by the recent studies that an individual's self-efficacy and perceived desirability are the source of arousal of entrepreneurial intentions (e.g., Linan & Fayolle, 2015).

Compared to past epidemics, COVID-19 has spread rapidly worldwide and has caused unprecedented uncertainty on a global scale (Hernández-Sánchez et al., 2020). However, numerous firms may also adjust their business models or even close their businesses during this difficult time. Paradoxically, this brutal pandemic is also considered a for-opportunity accelerator for entrepreneurs in response to people's daily life activities, such as online education, digitalization, communication, entertainment, etc. In this sense, the work of Maritz et al. (2020) has revealed that the roles of entrepreneurial activities and mindsets could well be the unsung hero in the times of the COVID-19 pandemic. Based on the above-mentioned reasoning, our first hypothesis was formulated as follows:

*H1: An individual's COVID-19 perception on entrepreneurship has a direct influence on their (a) self-efficacy in the current situation and (b) desirability towards entrepreneurship*

A positive attitude towards the situation can play a role in predicting entrepreneurial intentions. In this sense, several studies have included and altered attitudes towards behavior in different contexts. For example, attitude towards social distancing (e.g., Gibson et al., 2021; Yu, Lau, & Lau, 2021), attitude towards the uptake of a COVID-19 vaccine (Fan et al., 2021), attitude towards fears and worries (Ammar et al., 2020), attitude towards intentions for pro-environmental behavior in the times of COVID-19 (Lucarelli, Mazzoli, & Severini, 2020), and attitude towards entrepreneurship (Vamvaka et al., 2020; Botsaris & Vamvaka, 2016). However, incorporating the attitude towards the COVID-19 situation into the entrepreneurial behavioral model is in its infancy and is inconclusive.

Based on the planned behavior theory, attitude towards a behavior is also a conceptual antecedent of individual intention (Ajzen, 1991), which could be the main motivator for entrepreneurial trajectories (Shapero, 1982). Attitude and behavior have also been found to have a profound effect on self-efficacy towards behavioral intention (e.g., de Vries, Dijkstra, & Kuhlman, 1988; Boyd & Vozikis, 1994), which could bolster individuals' career confidence in addressing barriers they confront when achieving their career goals (Savickas & Porfeli, 2012). Thus, career confidence and adaptability are considered a source of self-efficacy (Rossier, 2015). In perilous situations, self-efficacy has not been investigated as a predictor of entrepreneurial ambition

(Bullough, Renko, & Myatt, 2014). Attitude towards the situation in the times of COVID-19 may jointly influence individuals' self-efficacy and their desire to become eventual entrepreneurs.

*H2: An individual's attitude towards the situation has a direct influence on their (a) self-efficacy in the current situation and (b) desirability towards entrepreneurship*

### **The mediating role of self-efficacy and desirability towards entrepreneurship**

As several studies have postulated that entrepreneurship and innovation play a pivotal role in improving and increasing the wealth and economy of a country (e.g., Hernández-Sánchez et al., 2020; Lee & Rodríguez-Pose, 2021), individuals' entrepreneurial mindsets and ecosystems should be fostered at such a critical time for wealth and growth. However, the factors that may have an impact on business processes and potential entrepreneurs' motivations during catastrophes have not yet been explored (e.g., Hernández-Sánchez et al., 2020; Maritz et al., 2020). In this direction, entrepreneurship as a career choice refers to individuals' perceived cognitions determined by their attitudes, intention, and action (Bandura, 1986). It is generally acknowledged that a profound understanding of how and what contributing factors could play a decisive role in predicting an individual's entrepreneurial aspiration requires further exploration.

Based on SCCT, the main point of the theory is the motivation driven by outcome expectation, self-efficacy, and goal-directed activity that could ultimately translate individuals' cognition to determine and make decisions on their career paths (Lent et al., 2002). Liguori et al. (2018) reaffirmed that applying the premise determinants of SCCT-informed propositions could significantly explain entrepreneurial intention. This echoes the intentionality-based model, which contends that entrepreneurial intention accrues when entrepreneurially motivated individuals perceive self-beliefs and desirability (Ajzen, 1991; Shapero, 1982). More critically, the work of Liguori et al. (2018) affirms that self-efficacy can mediate individuals' entrepreneurial intention relationships, which could be explained by the constructionist assumption that SCCT rests on the individuals' perceptions of their capacities to cope with their surroundings and their ability to self-reflect, be self-proactive, and self-organize to execute courses of actions over conditions that affect their life (Bandura, 1986). Zhao, Seibert, and Hills (2005) also confirmed that self-efficacy plays a mediating role in predicting entrepreneurial intentions, which are also related to an individual's perceived desirability towards



entrepreneurship. Especially in a traumatic situation, the social cognitive theory could contribute to explaining a person's perceived coping self-efficacy as the mediator towards personal contextual perceptions and traumatic adversity (Benight & Bandura, 2004). In the case of academic students, those who had higher risk-taking are more prone to pursue careers as entrepreneurs through their confidence perception (Zhao et al., 2005). These individuals' physiological state building could foster their desire to deal with difficult and risky situations more than those who are not (Sitkin & Weingart, 1995).

Several works have endorsed the close connections between perceived desirability and self-efficacy towards entrepreneurial aspirations (e.g., Linan & Fayolle, 2015). In this sense, Achchuthan and Nimalathasan (2012) found that perceived desirability has a major influence on entrepreneurial intentions. In the student sample, Zampetakis (2008) found that university students' perceived desirability could play a mediating role in promoting their entrepreneurial intentions. This view is confirmed by Yusoff, Ahmad, and Halim (2016), who reported that perceived desirability and entrepreneurship intention posit a positive effect between them.

During the COVID-19 pandemic, the disrupted environment could give rise to uncertainty and risk, which could weaken individuals' entrepreneurial intentions, especially those who are pessimistic (Bergenholtz, Klyver, & Vuculescu, 2021). However, the COVID-19 situation could be considered a double-edged sword that could facilitate an individual's entrepreneurial mindset with resilience and innovativeness in response to the concurrent situation, particularly, in sport entrepreneurship (Ratten, 2020), digital-supported entrepreneurship education (Secundo et al., 2021), and social entrepreneurship (Bacq & Lumpkin, 2020). An individual may perceive entrepreneurship as a desirable career option along with an individual's self-efficacy in adjusting to disturbing surroundings and related cognitive characteristics. Based on the above-mentioned reasoning, the following hypotheses are formed.

*H3: The mediated relationship between COVID-19 perception and entrepreneurial intentions, self-efficacy, and perceived desirability act as serial mediating factors.*

*H4: The mediated relationship between attitudes towards the situation and entrepreneurial intentions, self-efficacy, and perceived desirability act as serial mediating factors.*



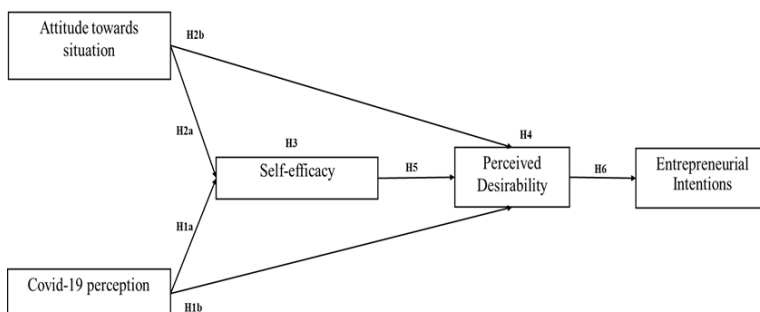
## The direct effect of self-efficacy and perceived desirability towards entrepreneurial intentions

Udayanan (2019) reported that self-efficacy plays a pivotal role in determining entrepreneurial intentions and outcome expectations. This view implied that individuals with higher self-efficacy also have high entrepreneurial intentions (Liguori et al., 2018). Higher entrepreneurial intentions could also be nurtured through the positive effect of perceived desirability (e.g., Uansa-ard & Wannamakok, 2020; Hernández-Sánchez et al., 2020; Păunescu, Popescu, & Duennweber, 2018). In parallel, several studies have investigated the effects of self-efficacy and perceived desirability, and found that these determinant factors are the backbone of individuals' entrepreneurial intentions. For instance, Kruger (2000) stated that those entrepreneurial actions could be developed further based on individuals' perceptions of the desirability and feasibility of the business. However, in the situation of high uncertainty and dangerous contexts, individuals' entrepreneurial intentions could be also fostered directly when they have self-efficacy and adversity (Bullough et al., 2014). Therefore, the last two hypotheses are raised as follows:

*H5: Self-efficacy has a direct influence on desirability towards entrepreneurship.*

*H6: Desirability towards entrepreneurship has a direct influence on entrepreneurial intentions.*

Based on the above-mentioned literature review, we further developed the theoretical framework to test a structural model empirically. In Figure 1, the framework explains the interrelationships between attitude and perception towards the COVID-19 situation and Thai individuals' entrepreneurial intentions. All hypotheses proposed in the study have also been visualized in Figure 1.



**Figure 1.** Theoretical framework

## METHODOLOGY

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### Data collection

The data in this study were collected through questionnaire-based surveys in the Thai language. The quota sampling approach was carried out with the faculty members' support and access to distribute the questionnaires in multiple universities. The Thai sample includes undergraduate students from several public and private universities located in eight provinces, eight districts, and eight cities throughout Thailand. The surveys were initially received from 800 respondents. After screening out incomplete responses, a sample of 798 college students was used to examine the hypotheses using structural equation modeling (SEM) and Process Macro Model 6.

Because this study explores casual relationships and serial mediators, the SEM and Process macro procedures were applied. SEM is a multivariate approach to testing the causal relationship that empirically tests direct and indirect effects on pre-assumed causal relationships (Fan et al., 2016). In the same vein, Process macro is a path analysis, and modeling tool for observed variables. It is widely used in the social, business, and health sciences to estimate the direct and indirect effects of parallel and serial mediators (Hayes, 2017). Therefore, these two approaches could be properly adopted to test the hypothesized model of the study empirically.

A statement of confidentiality was presented at the beginning of the questionnaire to assure participants of the strict privacy of their responses and to comply with the requirements of research ethics. Table 1 shows that 72.3% of the participants were female and 27.7% were male. Due to participant concerns, in some entrepreneurial intention-related studies, the samples may not be balanced (e.g., Doanh, 2021; Shahzad et al., 2021; Younis et al., 2021). One plausible reason is based on the work of Simundic (2013), who stated that the samples in a study should ideally be chosen at random while still complying with the study's criteria. Additionally, over 89.8% of the participants were interested in indoor activities, such as social media, movies, music, surfing the net, and resting. Few university students (7.1%) are into outdoor activities, such as sports, meeting with friends, hanging out, and nightlife. Meanwhile, 70.6% stay with their parents and the majority of them have never had any entrepreneurial experiences. Based on the Global Entrepreneurship Monitor Report (GEM, 2015), youth who study at a university tend to have a higher propensity for entrepreneurial careers. As such, scholarly interest in understanding the factors that may influence the entrepreneurial motivations of students in educational institutions has been growing.

**Table 1.** Sample characteristics

Variable	Category	n	%
Gender	Male	221	27.7
	Female	577	72.3
Activity	Indoor (Social media, movies, music, surfing the net, resting)	717	89.8
	Outdoor (Sport, meeting friends, hangout, nightlife)	57	7.1
	Others	24	3.1
Living condition	With parents	563	70.6
	With grandparents	73	9.1
	Alone	25	3.1
	Friends or soul mate	59	7.4
	Others	78	9.8
Previous experience in entrepreneurship	Yes, I used to have my own business	35	4.4
	Yes, my family used to have a business	125	15.7
	Never	638	79.9
Current experience in entrepreneurship	Yes, I currently have my own business	21	2.6
	Yes, my family currently owns a business	140	17.5
	Never	637	79.9

## Measures and validation

**Attitude towards the situation.** The five scale items have been adopted and adjusted from the literature (e.g., Kelberer, Kraines, & Wells, 2018; Antoci, 2021; Peng et al., 2020). An example is “Despite the COVID-19 situation, I am still positive towards my future career.” The respondents rated items using a scale ranging from 1 (disagree) to 7 (agree). The average variance extracted (AVE) and composite reliability (CR) for this construct are 0.63 and 0.89, respectively.

**COVID-19 perception.** Six question items were used to measure this construct and were adjusted from the work of Hernández-Sánchez et al. (2020). One of the items is “I believe that COVID-19 will affect my future career as an entrepreneur.” We designed questionnaires wherein the respondents used a scale ranging from 1 (disagree) to 7 (agree) to rate items. The AVE and CR for this construct are 0.60 and 0.89, respectively.

**Self-efficacy.** This variable contained five scale items that were adjusted from Bullough et al. (2014). The respondents were asked to conduct self-report questionnaires and one example item is "I believe that I could adjust myself into the new situation and environment." The AVE and CR for this construct are 0.54 and 0.86, respectively.

**Perceived desirability.** We adopted four scale items from the existing literature (e.g., Linan & Fayolle, 2015). An example is "among various career options, being an entrepreneur is my desired career choice." The AVE and CR for this construct are 0.62 and 0.86, respectively.

**Entrepreneurial intentions.** The four scale items included in this study were from existing literature (e.g., Păunescu et al., 2018; Kruger, 2000). For example, "I purposely aim to be an entrepreneur." The AVE and CR for this construct are 0.78 and 0.93, respectively. More details on the scale assessment are presented in Table 7 listed in the Appendix 2.

**Control variables.** Three control variables have been added in the study namely gender (Male=1, Female=0), previous entrepreneurial experience (2=Yes, I used to have my own business, 1=Yes, my family used to have a business, 0=Never), and current entrepreneurial experience (2=Yes, I currently have my own business, 1=Yes, my family currently owns a business, and 0=Never), respectively.

### **Common Method Bias (CMB)**

The data from the survey follow steps to reduce biases, including common method variance (Podsakoff et al., 2013). Thus, we undertook procedures recommended by Podsakoff et al. (2013) to reduce and evaluate the magnitude of common method bias. Next, Kaiser's criterion for retention of factors was followed. The sample size appeared to be large enough for the factor analysis, at least based on the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO=0.917). Although the questionnaire items in this study have been rigorously adopted from relevant literature, the confounding influence of CMB on the statistical results can emerge. Then, we conducted Harman's one-factor test on all items, extracting five distinct factors to examine any potential CMB. According to Podsakoff et al. (2003), the total variance for one factor should not exceed 50%. Harman's single factor score for this study was 32.5%. Thus, no single factor emerged. These results suggested support for the validity of our measures. Before testing the six hypothesized assumptions

using SEM and Process Macro (Hayes), the mean, standard deviations, and correlations among constructs have been examined.

**Table 2.** Correlations

	Mean	SD	Correlations				COVID-19 perception
			Attitude	Self-Efficacy	Desirability	Intention	
Attitude	5.714	0.960	<b>0.793</b>				
Self-efficacy	5.423	0.847	0.650**	<b>0.734</b>			
Desirability	5.238	1.120	0.376**	0.402**	<b>0.787</b>		
Intention	5.323	1.191	0.352**	0.349**	0.686**	<b>0.883</b>	
COVID-19 perception	5.294	1.239	0.207**	0.216**	0.221**	0.206**	<b>0.774</b>

**Note:** The square root of AVE (in bold on diagonal), SD = Standard deviation.

Table 2 shows further results of the correlations and relationships between the five influential factors and entrepreneurial intention. This table demonstrates that the investigation on the constructs' correlations of all factors and entrepreneurial intention construct is found to be significantly consistent. Among all variables, the perceived desirability variable obtained the least score at 5.238 with a 1.120 SD score. The correlation of each construct is smaller than the square root of each construct's AVE. The squared AVE was used to assess discriminant validity, as shown on the diagonal lines that imply that the discriminant validity and inter-correlations between variables are sufficient.

## RESULTS

In the next step, SEM was used to analyze the data and relationships of variables by applying the statistical software, AMOS. SEM or Linear Structural Relations is a modeling technique used in behavioral science. It combines factors analysis and regression or path analysis. The technique is often based on theoretical constructs and is represented by hidden factors. SEM analysis can analyze the correlation of model determinants, relationship strength for cross-sectional data, and the development of a modeling strategy.

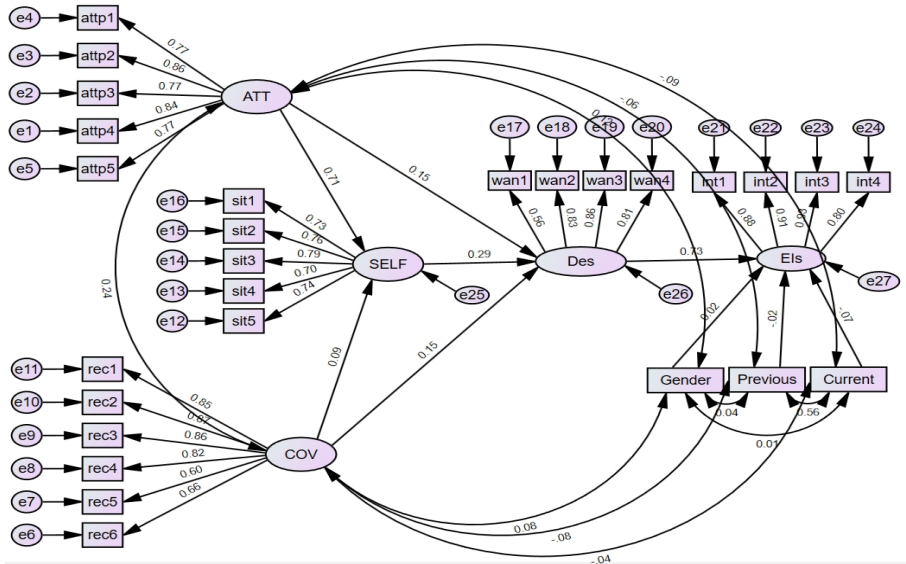


Figure 2. Structural Equation Modeling (SEM).

Figure 2 shows that the path analysis has illuminated research findings based on path relationships between constructs. The goodness of fit model was also satisfactory and indicated a model fit (standardized root mean square residual: standardized RMR = 0.080, root mean square error of approximation: RMSEA= 0.061, comparative fit index: CFI = 0.931, goodness of fit index: GFI = 0.918, and adjusted goodness of fit index: AGFI = 0.897).

Table 3. Results of Structural Equation Modeling (SEM)

Hypotheses	Paths	t-value	β	Results
H1a	COVID-19 perception → Efficacy	2.74	0.030**	Supported
H1b	COVID-19 perception → Desirability	4.41	0.032***	Supported
H2a	Attitude towards the situation → Efficacy	16.82	0.038***	Supported
H2b	Attitude towards the situation → Desirability	2.61	0.047**	Supported
H5	Efficacy → Desirability	4.57	0.055***	Supported
H6	Desirability → Entrepreneurial intention	14.34	0.079***	Supported

Note: \*\*p< 0.01, \*\*\*p< 0.001.

Table 3 shows that the results of SEM indicated that COVID-19 perception had a positive effect on efficacy, thereby supporting H1a (\*\*p< 0.01, Coef=0.030, t-value=2.74). This result implies that individuals'

previous COVID-19 perceptions affect their self-esteem in coping with the current pandemic. COVID-19 perceptions also positively significantly affect their perceived desirability towards entrepreneurship, which confirms H1b ( $***p < 0.001$ , Coef=0.032, t-value = 4.41). Individuals perceived COVID-19 as a situation that aroused their desire to be entrepreneurs, which fully confirms Hypothesis 1. These positive findings statistically signify individuals' attitude towards their self-efficacy ( $***p < 0.001$ , Coef=0.038, t-value= 16.82) and perceived desirability ( $**p < 0.01$ , Coef=0.047, t-value= 2.61). Therefore, H2a and H2b are statistically significant and confirmed Hypothesis 2. Based on the last two hypotheses that have been postulated to have direct effects on antecedents, the results showed that H5 directly posited a positive effect on individuals' perceived desirability ( $***p < 0.001$ , Coef=0.055, t-value = 4.57). In the same line, H6 is also found to be influenced by perceived desirability towards entrepreneurial intentions ( $***p < 0.001$ , Coef=0.079, t-value = 14.34), which affirms our assumptions. Additionally, before testing Hypotheses 3 and 4, a preliminary investigation to examine the mediating roles of self-efficacy and desirability towards entrepreneurial intentions by the bootstrapping technique was applied with the resampling of 5000, and the bias-corrected confidence interval was adopted at 95% through AMOS software as shown in Table 4.

**Table 4.** Results of mediating effects using the bootstrapping technique

Paths	Indirect effects	Standard Error	95% confidence interval	
			LLCI	ULCI
ATT → SE → DES	0.265***	0.069	0.136	0.411
ATT → DES → EI	0.327***	0.041	0.252	0.413
COV → SE → DES	0.026**	0.012	0.007	0.056
COV → DES → EI	0.134***	0.034	0.071	0.205
SE → DES → EI	0.287***	0.071	0.149	0.434

**Note:**  $**p < 0.01$ ,  $***p < 0.001$ ; ATT= Attitude towards the situation, Cov= COVID-19 perception, SE=Self-efficacy, DES= Desirability, and EI= Entrepreneurial intention. LLCI=Lower level of 95% confidence interval; ULCI= Upper level of 95% confidence interval.

Table 4 shows that self-efficacy and perceived desirability play mediating roles in determining entrepreneurial intentions, which are statistically significant at 0.01 and 0.001 levels. The LLCI (lower level) and ULCI (upper level) of the 95% confidence interval do not include zero, which further confirms that self-efficacy and perceived desirability have indirect effects on individuals' entrepreneurial intentions. Lastly, Hypotheses 3 and 4 were investigated to



examine the serial mediating roles of self-efficacy and perceived desirability using Process Macro Model 6 based on the recommendation of Hayes (2017). According to Hayes (2017), any regression program may be useful for model coefficient estimation. In this sense, the statistics tools can be also computed to validate research results and inferential tests that require the integration of information in the equations of mediation (M) and dependent variable (Y).

To validate the significant level and serial mediation model, the lower limit confidence interval (LLCI) and upper limit confidence interval (ULCI) should not include zero as adopted in Model 6. We also followed Preacher and Hayes (2017) on the use of a bias-corrected bootstrapping procedure of 5,000 resamples with the bias-corrected 95% confidence interval (CI) of multiple mediation effects.

**Table 5.** Results of Process Macro Model 6

Effects	$\beta$	SE	Bootstrap 95% CI		Results
			LLCI	ULCI	
<b>Hypothesis 3</b>					
Total direct Effect	0.05	0.03	-0.10	0.10	Supported
Total indirect Effect	0.15	0.03	0.10	0.21	
Ind1: Cov → Eff → EI	0.02	0.01	0.01	0.03	
Ind2: Cov → Des → EI	0.09	0.02	0.04	0.14	
<b>Ind3: Cov → Eff → Des → EI</b>	<b>0.05</b>	<b>0.01</b>	<b>0.03</b>	<b>0.07</b>	
<b>Hypothesis 4</b>					
Total direct Effect	0.11	0.04	0.03	0.19	Supported
Total indirect Effect	0.33	0.04	0.25	0.40	
Ind1: Att → Eff → EI	0.03	0.03	-0.03	0.09	
Ind2: Att → Des → EI	0.16	0.04	0.09	0.23	
<b>Ind3: Att → Eff → Des → EI</b>	<b>0.14</b>	<b>0.03</b>	<b>0.09</b>	<b>0.19</b>	

**Note:** ATT= Attitude towards the situation, Cov= COVID-19 perception, SE=Self-efficacy, DES= Desirability, and EI= Entrepreneurial intention. LLCI= Lower level of 95% confidence interval; ULCI= Upper level of 95% confidence interval.

Table 5 shows the results of the serial mediating roles of self-efficacy and perceived desirability towards entrepreneurial intentions using Process Macro Model 6. Hypothesis 3 posits a positive and supportive assumption, which implies that individuals' COVID-19 perceptions play a role in determining their entrepreneurial intentions through the positive influence of self-efficacy and perceived desirability. This assumption is in the same direction as

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Hypothesis 4, which postulates a positive and supportive assumption, which could further be explained by individuals who post their attitude towards the current situation are influenced by the serial mediating roles of self-efficacy and perceived desirability towards their entrepreneurial intentions.

## DISCUSSION

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The global challenges that the COVID-19 pandemic has posed to the economy and society have led to entrepreneurial activities being considered as the backbone of transformational and unsolved economic activities for growth (Maritz et al., 2020). By taking an entrepreneurship perspective, recent graduates will face more challenges when embarking on their careers. However, they were trained and attended entrepreneurship education in educational institutions that have also changed normal classroom learning to online methods, which has enabled the youth to think innovatively in response to the pandemic by nurturing their entrepreneurial resilience thinking (Ratten, 2021). As such, in this adverse situation, a profound understanding of what factors could contribute to the extent of entrepreneurship as a career choice in times of crisis is of great importance for individuals' desire to grow and be innovatively resilient.

This study found that perceived desirability would mediate and directly affect relationships between COVID-19 pandemic perception, attitude towards the situation, and entrepreneurial intention. The finding is in line with the view of the premise of SCCT and TPB that self-efficacy would mediate and directly affect relationships between COVID-19 pandemic perception, attitude towards the situation, and perceived desirability. Therefore, the theoretical model of this study adds to the literature on the significant roles of self-efficacy and perceived desirability towards entrepreneurship. In particular, this study joins the few studies on the potential serial mediating effects of self-efficacy and perceived desirability on individuals' perceptions and entrepreneurial intentions during the COVID-19 pandemic as presented in the current literature.

Our research results resonate with the current literature. For instance, Liguori and Pittz (2020) found that the COVID-19 pandemic had brought about a positive change in individuals' mindsets to be more resilient, which later recognized emerging opportunities for entrepreneurship. Maritz et al. (2020) also explicated that the COVID-19 pandemic could serve as an enabler of new business establishments. They highlighted the opportunities for new businesses around the pandemic and provided narratives from expert opinions on the relationship between the COVID-19 pandemic

and entrepreneurial mindsets and initiatives through this entrepreneurial hardship condition. Our results are also in accordance with the premises of SCCT that could explain individuals' reinforcements to their career choices through the lens of cognitive determinants (Lent et al., 2002), particularly on how individuals could adapt and foster entrepreneurship during this pandemic. However, the existing literature has not produced consistent results, which may be due to human behaviors on risk evaluation, attitude towards situations, and failure that may jointly be the main suppressors for their career choice (Lent et al., 2000).

In terms of the influence of individual risk-takers, our findings help reconcile the dispute over the role of SCCT by disentangling the complicated relationship between self-efficacy, expected outcomes as entrepreneurs, and their planned behaviors. Hernández-Sánchez et al. (2020) also argued that individuals' perceptions towards the COVID-19 pandemic may mitigate their entrepreneurial intention. However, they also found that those who were more proactive and optimistic about the current situation increased their entrepreneurial intentions. In this sense, Krichen and Chaabouni (2021) found that few studies have focused on the COVID-19 pandemic and its effects on students' entrepreneurial intentions. They also noted that academic students' perceptions of personal risks on their entrepreneurial intentions are contingent upon the concurrent crisis because it could be perceived as either an opportunity or an obstacle. Therefore, this study elucidates how individuals' cognitive perceptions are translated into their motivations to become entrepreneurs under the contingent effect of self-efficacy and perceived desirability.

## CONCLUSION

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The findings of this research shed new light on the quest of authorities and relevant policymakers in launching effective policies to nurture potential entrepreneurs who are viewed as unsung heroes in times of crisis. All hypothesized assumptions are supported. The formulated hypotheses on the serial mediating effects of self-efficacy and perceived desirability are confirmed and statistically significant. Generally, individuals' positive attitude and perception towards the COVID-19 pandemic have influenced their entrepreneurial intentions: individuals' intentions to become entrepreneurs are cultivated when they perceived their capability to cope with the current situation and perceived desirability towards entrepreneurship. Additionally, our research findings also provide insight into the joint determinants of self-efficacy and perceived desirability that serve as serial mediating roles

in examining entrepreneurial intentions. Thus, a crisis such as the COVID-19 pandemic requires the inclusion of further investigating components and breakthrough new frontiers, which could help in the empirical testing of the manifestation of entrepreneurial aspirants' motivating factors. As a result, the entrepreneurial ecosystem could be fostered, and consequently mitigate the unemployment rate and poverty of the country.

This paper has presented several contributions. This research echoes the social cognitive career theory and planned behavior theory to examine academic students' entrepreneurial intentions during the COVID-19 pandemic. However, this paper has limitations. First, although the analyses suggest that the magnitude of common method variance was not serious, our findings should still be interpreted with caution. Sample characteristics, such as gender, age, and academic major, should be examined further to understand how the demographic factors influence individuals' entrepreneurial behaviors. Second, because of causality concern, we investigated entrepreneurial intentions based on the individuals' perceptions and their entrepreneurial intentions indirectly through perceived desirability (Krueger, 1993) and self-efficacy (Liguori et al., 2018). However, individuals' perceptions may also depend on events rather than perception and experience (Gist & Mitchell, 1992). Moreover, because explanatory, mediator, and response variables are contemporaneous variables at the same time point, future research may consider inserting contemporaneous variables measured at different time points. Although these variables could be malleable, future research should consider this issue. Third, the limitations of the theoretical model of the study mean a more plausible theoretical model could be considered when engaging in an in-depth exploration. In this sense, future research could investigate how entrepreneurial intentions could be influenced by the moderation of perceptions and attitudes related to the COVID-19 pandemic in different contexts. However, Doanh (2021) found that self-efficacy may not play a moderating role in the relationship between antecedents and entrepreneurial intentions. Thus, future research could also explore these causal relationships more thoroughly. Besides, measuring COVID-19 perception by using panel data, instead of participants' subjective ratings are recommended to highlight properly the ongoing nature of the pandemic and how it affects entrepreneurial trajectories. In particular, entrepreneurship education programs and other incentives provided for young people to engage in sustainable entrepreneurship during the COVID-19 pandemic should be assessed further (Ratten, 2021).

Based on these concerns, we have demonstrated additional model testing (see Appendix) and we hope that our proposed research model could be advantageous for future research to replicate and further consider other

cognitive factors to explore university students' entrepreneurial intentions within a traumatic situation.

Policymakers and institutions that intend to nurture entrepreneurship through training programs should design the curriculum such that it supports the unique challenges of launching an enterprise around a crisis. A more accommodating and more instrumental ambiance in education can support individuals' self-efficacy and perceived desirability towards entrepreneurship as a career choice. Future studies could also examine the effects of the cognitive perceptions of different individuals with different disciplines and backgrounds who wish to devote themselves to an entrepreneurial career. It could also give rise to more innovators and resilient individuals who can adopt a crisis analogy to address an unsolved problem.

Additionally, our findings provide useful implications for boosting potential individuals to engage in entrepreneurial activities. Governments, policymakers, and universities should work together to design various guidance and policies to foster innovative and self-confident inputs for individuals. Therefore, those individuals may have a brilliant idea to resolve social and economic problems that would largely alleviate social exhaustion and the disequilibrium between crisis and their behavioral tendencies towards entrepreneurship, consequently influencing the sustainable improvement of economic and social welfare.

### Appendix 1. Additional Model Testing

The alternative model testing has been proposed to test the possible research model empirically. This research model concept relates how attitude towards the situation and COVID-19 perception play moderating roles in predicting the relationship between self-efficacy, perceived desirability, and entrepreneurial intentions. Figure 3 below demonstrated the alternative theoretical framework.

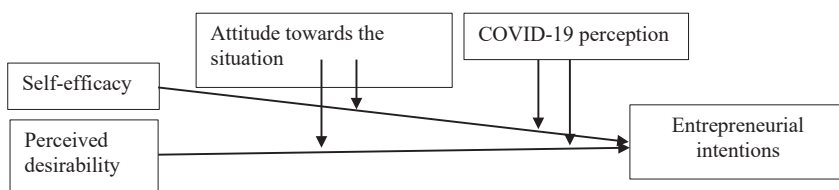


Figure 3. The alternative theoretical framework

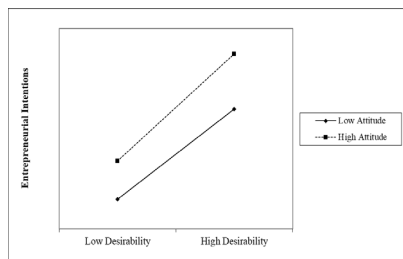
**Table 6.** Multiple regression analysis results.

	Model1	Model2	Model3	Results
<b>Control Variables</b>				
<i>Gender</i>	0.212*	0.008	0.003	
<i>Previous Entrepreneurial Experience</i>	-0.264**	-0.058	-0.060	
<i>Current Entrepreneurial Experience</i>	-0.237*	-0.141	-0.126	
<b>Main effects</b>				
<i>Self-efficacy</i>		0.038	0.043	(n.s.)
<i>Perceived Desirability</i>		0.656***	0.649***	(Sig.)
Attitude towards the situation		0.107**	0.115**	
Perceived COVID-19		0.038	0.033	
<b>Two-way interactions</b>				
<i>Desirability*Attitude</i>			0.117***	(Sig.)
<i>Efficacy*Attitude</i>			-0.082**	(Sig.)
<i>Desirability*COVID-19</i>			-0.036	(n.s.)
<i>Efficacy*COVID-19</i>			0.027	(n.s.)
<b><math>\Delta R^2</math></b>	0.043***	0.451***	0.010**	
<b><math>R^2</math></b>	0.043	0.494	0.504	
<b>Adjusted <math>R^2</math></b>	0.039	0.490	0.497	
<b>F-test</b>	10.76***	99.50***	65.49***	
<b>Durbin-Watson</b>			2.001	

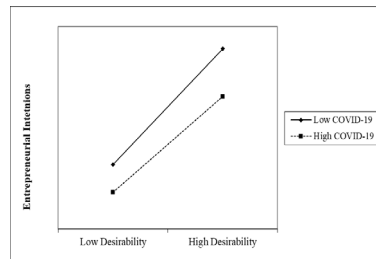
Note: \*\*  $p < 0.001$ , \*\*\*  $p < 0.01$ , \*  $p < 0.05$ .

Based on Table 6 above, the empirical results from model 1 show that the three control variables were significant. In model 2, main effects, as well as moderating roles, are included. The results show that perceived desirability and attitude towards the situation indicated significant results ( $\beta = 0.656$ ,  $p < 0.001$ ,  $\beta = 0.107$ ,  $p < 0.001$ ). Then, interaction terms are entered, which further explain the moderating roles of attitude towards the situation and perceived COVID-19 on the relationship between self-efficacy, perceived desirability, and entrepreneurial intentions. The results show that attitude towards the situation significantly moderated the relationship between perceived desirability, self-efficacy, and entrepreneurial intentions ( $\beta = 0.117$ ,  $p < 0.001$ ,  $\beta = -0.082$ ,  $p < 0.01$ ). However, the moderating role of COVID-19 perception did not indicate significant results in the relationship between perceived desirability, self-efficacy, and entrepreneurial intentions.

As we further examined the significant two-way interpretations among attitude towards the situation, perceived desirability, self-efficacy, and entrepreneurial intentions, we have plotted the interaction effects, as presented in Figures 4 and 5 below.



**Figure 4.** Moderating effect of attitude towards the situation on perceived desirability and entrepreneurial intention



**Figure 5.** Moderating effect of COVID-19 perception on perceived desirability and entrepreneurial intention

In Figure 4, the plot suggests that the impact of university students' perceived entrepreneurship as a career desirable on their entrepreneurial intention is highest when the level of their attitude towards the situation is also high. On the other hand, Figure 5 elucidates the two-way interaction plot, illustrating the impact of university students' perceived desirability on their entrepreneurial intentions is highest when the level of COVID-19 perception is low than when it is high. This could signal theoretical implications for researchers to focus on these cognitive factors that may have an impact on individuals' entrepreneurial intentions and apply them to different contexts.

## Appendix 2.

**Table 7.** The results of scale assessment.

Constructs	Items	Factors Loading	AVE	CR
Attitude towards the situation	Due to the COVID-19 situation, I am still positive about my future career.	0.71	0.63	0.89
	Due to the COVID-19 situation, I am still thinking about my success in my future career.	0.82		
	I think I have my own career interest during the concurrent of COVID-19.	0.78		
	Although the COVID-19 situation, I will still positively fulfill my future career.	0.86		
	I believe that I will make the right decision for my career during COVID-19.	0.79		



Constructs	Items	Factors Loading	AVE	CR
Self-efficacy in adaptation	I believe that I could adjust myself to the new situation and environment.	0.68	0.54	0.86
	I believe that I could adjust to the situation if my plans for my future career change.	0.73		
	I believe that I could adapt and overcome difficulties that arise when working.	0.80		
	I believe that I will adapt positively to the COVID-19 situation.	0.72		
	I believe that I could adjust myself to my future career and market.	0.75		
Perceived desirability	I believe that having my own business would be a good idea.	0.60	0.62	0.86
	I believe that being an entrepreneur would be well suited for me.	0.83		
	If I have the opportunity, I genuinely would like to be an entrepreneur.	0.85		
	Among various career options, being an entrepreneur is my desired career choice.	0.83		
COVID-19 perceptions	I believe that COVID-19 will slightly affect my future career as an entrepreneur.	0.79	0.60	0.89
	I believe that COVID-19 will slightly affect my future opportunity for my career.	0.82		
	I believe that COVID-19 will slightly influence my future plan and decisions.	0.89		
	I believe that COVID-19 will slightly influence my future intention to be an entrepreneur.	0.83		
	I believe that COVID-19 will slightly influence my thoughts and considerations towards future plans.	0.61		
	I believe that I am still confident about my future career as an entrepreneur.	0.67		

Constructs	Items	Factors Loading	AVE	CR
Entrepreneurial Intentions	I purposely aim to be an entrepreneur.	0.88	0.78	0.93
	I always come up with the idea of being an entrepreneur.	0.91		
	I intentionally create my venture in the future.	0.93		
	My ultimate goal is to be an entrepreneur.	0.80		

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### Abstrakt

**CEL:** *Chociaż pandemia COVID-19 miała katastrofalny wpływ na działalność gospodarczą na całym świecie, paradoksalne zjawisko tej sytuacji czarnego łabędzia można uznać za ułatwiające przedsięwzięcia intencje. Niniejsze badanie ma na celu zbadać postrzeganie aspiracji przedsięwzięcia studentów z Tajlandii w czasie pandemii COVID-19.* **METODOLOGIA:** *Opierając się na społecznej teorii kariery poznawczej, badanie to bada głębokie powiązanie postrzeganie COVID-19 przez studentów uniwersytetów i postaw wobec sytuacji związanych z uwierzeniem w siebie w adaptację do przedsiębiorczości. Prawidłowa próba 798 ankiet zebrana z ośmiu prowincji, ośmiu okręgów i ośmiu miast w całej Tajlandii została uwzględniona do dalszej analizy przy użyciu Modelowania Równań Strukturalnych (SEM) i Modelu Makro Procesu 6.* **WNIOSKI:** *Postrzeganie pandemii COVID-19 przez studentów uniwersytetów wpływa na ich samoocenę, skuteczność w adaptacjach sytuacyjnych i postrzegane pożądanie wobec intencji przedsięwzięcia na poziomie indywidualnym. Co ciekawe, poczucie własnej skuteczności i skłonność do przedsiębiorczości działają jako seryjne czynniki pośredniczące, wobec zapośredniczonej relacji między postawą wobec sytuacji, percepcją COVID-19 a przedsięwzięciami intencjami studentów.* **IMPLIKACJE:** *Wyniki tych badań mogą wzbogacić literaturę dotyczącą przedsiębiorczości, zaproponowano*

również dodatkowe testy modelowe. Ponadto praktycy i badacze mogliby współpracować z gubernatorami w celu kultywowania trajektorii przedsiębiorczości w oparciu o wyniki badań. **ORYGINALNOŚĆ I WARTOŚĆ:** Społeczna teoria kariery (SCCT) może zracjonalizować wybór kariery zawodowej studenta akademickiego w zakresie przedsiębiorczości, biorąc pod uwagę jego postrzeganie procesów uruchamiania firm podczas COVID-19. Przyszłe badania mogą również dokonać weryfikacji wyników na reprezentatywnej próbie na poziomie krajowym.

**Słowa kluczowe:** COVID-19, intencje przedsiębiorcze, poczucie własnej skuteczności, postawa, sytuacja, celowość, teoria kariery

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## Conflicts of interest

The authors declare no conflict of interest.

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