

## Article

# The Mediating Role of Entrepreneurial Mindset between Intolerance of Uncertainty and Career Adaptability

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**Abstract:** Entrepreneurship education has been employed broadly in higher education, and one of the most popularly targeted outcomes is enhancing entrepreneurial mindset. However, the role of entrepreneurial mindset has not been examined in relation to career adaptability, which has been acknowledged as an important resource for adjustment, especially with the increased uncertainty caused by COVID-19. The current study investigated the relations among intolerance of uncertainty—specifically its sub-factors, prospective anxiety and inhibitory anxiety—career adaptability, and entrepreneurial mindset in 274 Korean college students facing school-to-work transition during COVID-19. The study conducted path analysis and evaluated the mediating effect of entrepreneurial mindset, using a 95% bootstrapping confidence interval, to better understand the role of entrepreneurial mindset in general career development in the context of uncertainty. The results found that inhibitory anxiety had an inverse association with career adaptability and entrepreneurial mindset, while prospective anxiety had a positive relation with career adaptability and entrepreneurial mindset. Entrepreneurial mindset and career adaptability showed a significantly positive relation, and the mediating role of entrepreneurial mindset between intolerance of uncertainty and career adaptability was also supported. Discussions on the role of entrepreneurial mindset are initiated and practical implications for entrepreneurship education are proposed along with the limitations of the study.

**Keywords:** entrepreneurial mindset; career adaptability; intolerance of uncertainty; prospective anxiety; inhibitory anxiety; college student



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## 1. Introduction

### 1.1. Background and Purpose of the Study

Research on the education and development of entrepreneurship has been gaining increased attention [1]. In modern society, in which the business environment has become more dynamic and technology is advancing rapidly, entrepreneurship, which leads to the creation of new opportunities and businesses, can lead to a revitalization of the economy [2]. Since entrepreneurial competence can be developed and learned through education [3], entrepreneurship education has expanded rapidly within the field of higher education [4].

Entrepreneurship education does not merely encourage learners to initiate their own business but helps them to acquire the necessary skills that would enable them to identify and pursue new opportunities [5]. In other words, entrepreneurship education “leads to openness to change, willingness to adapt to new situations, and ability to work in an uncertain environment” [5] (p. 216). As such, entrepreneurship education fosters important competence necessary for individuals not just to create ventures but to adjust to an unpredictable and rapidly changing environment. Therefore, entrepreneurship education has been extended to the curricula of diverse disciplines and extracurricular activities [6].

In Korea, entrepreneurship education began to gain interest following the IMF financial crisis, during which the unemployment rate rocketed and the number of young

venture start-ups plummeted [7]. The government and academia invested in promoting entrepreneurship education in higher education in order to bring economic recovery, but the initial education mainly focused on venture start-ups, which has been evaluated as not leading to the actual cultivation of entrepreneurship among students [7]. Today, there is a growing emphasis on entrepreneurship education to foster factors embedded in entrepreneurship, such as innovativeness, initiative, and risk-taking [8], but the relevant research is still limited [9].

While the majority of previous studies have focused on the impact of entrepreneurship education on factors such as entrepreneurial intent, knowledge, skills, and behavior [10], increased attention is being given to entrepreneurial mindset to be considered in entrepreneurship education [11,12]. Recent studies have found that entrepreneurship education positively influences entrepreneurial mindset [13,14]. Entrepreneurial mindset refers to the cognitive ability that allows individuals to flexibly adapt to a dynamic, uncertain environment [15]. It involves creativity, innovativeness, and risk-taking necessary for adjustment, creating new values, and utilizing new opportunities [16]. These properties of the entrepreneurial mindset are applicable not just to venture creation but to general career development, and there are studies investigating entrepreneurial mindset in relation to general career-related factors such as career awareness [17] and career decision-making self-efficacy and career maturity [18]. However, there are no studies directly investigating the relation between entrepreneurial mindset and career adaptability.

Career adaptability refers to coping resources that enable individuals to tackle complex and unfamiliar problems in the context of an uncertain and unstable labor market environment [19]. Career adaptability involves competences such as planning, decision-making, exploring, and problem-solving [19], while the entrepreneurial mindset influences managing resources, making decisions, and taking control [20]. Since both entrepreneurial mindset and career adaptability are related to navigating through and adjusting to an uncertain environment to pursue one's own career, the present study intends to investigate their relationship empirically.

The current study also examines the influence of intolerance of uncertainty. The labor market has increasingly become more unpredictable with the advancement of society and technology, but this has been amplified due to the outbreak of COVID-19. As the pandemic is prolonged, global and domestic economic damage is evident, and the unpredictable labor market conditions have affected the career trajectory of many people [21]. In particular, the level of uncertainty has increased for university students who are facing school-to-work transition amidst the pandemic. In such a precarious environment, an individual's level of tolerance to uncertainty would play a critical role. Since entrepreneurial mindset and career adaptability cannot be examined separately from the context in which they manifest, it would be important to examine the influence of intolerance of uncertainty.

In sum, the current study intends to investigate the relations among intolerance of uncertainty, career adaptability, and entrepreneurial mindset. The study focuses on college students in Korea who are facing school-to-work transition in the midst of COVID-19. By examining the relations among the variables, the current study aims to provide a better understanding of the scope of influence that entrepreneurial mindset has on general career development in the context of an uncertain environment, which may lead to practical implications for entrepreneurship education focusing on cultivating an entrepreneurial mindset.

## 1.2. Previous Studies and Hypotheses

### 1.2.1. Intolerance of Uncertainty and Career Adaptability

The influence of intolerance of uncertainty has been gaining attention as the COVID-19 outbreak continues for over a year. Various studies have examined intolerance of uncertainty in relation to loneliness [22], mental wellbeing [23], and positivity [24]. Intolerance of uncertainty is defined as "the predisposition to react negatively to an uncertain event or situation, independent of its probability of occurrence and of its associated consequences" [25] (p. 678). Freeston et al. [26] initially developed a 27-item scale to measure intolerance

of uncertainty, based on which Carleton et al. [27] created a short version consisting of 12 items with two factors, namely prospective anxiety and inhibitory anxiety. Prospective anxiety reflects the tendency to take active measures to reduce uncertainty, while inhibitory anxiety entails withdrawing and paralyzing in uncertain situations [28]. Most of the previous studies have used the total score of the two factors to assess intolerance of uncertainty, but in a study examining intolerance of uncertainty and behavioral decision making in an uncertain situation, prospective anxiety and inhibitory anxiety showed slightly different results. For example, performance on both executive functioning and risk-gaining tasks was inversely related to both inhibitory and prospective anxiety, whereas the magnitude of the relations was greater for prospective anxiety than inhibitory anxiety [29]. Such different results were also noted in another study examining whether intolerance of uncertainty predicts a startled response while anticipating temporally uncertain aversive shock; although the direction of the relations was the same for both subscales, the strength of the relation to the anticipatory startle responses was greater for inhibitory anxiety than for prospective anxiety [30]. Since prospective anxiety and inhibitory anxiety reflect rather contrasting responses to uncertainty—that is, prospective being more approach-oriented, and inhibitory being more avoidance-oriented—the two factors may have a different magnitude of influence on the variables being investigated in this study.

Although there is a limited number of studies examining the relationship between intolerance of uncertainty and career adaptability, it has been found that intolerance of uncertainty has a negative association with career adaptability [31,32]. However, these studies have not examined prospective and inhibitory anxiety separately; hence, the following hypotheses are considered in the present study.

**Hypothesis 1 (H1).** *Prospective anxiety, a sub-factor of intolerance of uncertainty, will have a negative correlation with career adaptability.*

**Hypothesis 2 (H2).** *Inhibitory anxiety, a sub-factor of intolerance of uncertainty, will have a negative correlation with career adaptability.*

### 1.2.2. Intolerance of Uncertainty and Entrepreneurial Mindset

Thus far, no previous study seems to have investigated the direct relationship between intolerance of uncertainty and entrepreneurial mindset. However, there are several studies that have focused on the perceived ambiguity and uncertainty of the learners, which leads to entrepreneurial learning or the development of entrepreneurial competence. Specifically, a study was conducted using mixed methods to identify emotional events and entrepreneurial competencies that are developed within these emotion-laden situations [33]. In the study, uncertainty and confusion in the learning environment was identified as one of the emotionally intense events that led to the development of entrepreneurial competencies, such as increased uncertainty/ambiguity tolerance and self-efficacy [33]. Although not explicitly mentioned, the accounts of the participants indicated that they were positively reacting to uncertain situations. In another study, ambiguity and uncertainty were created by exposing students to a learning setting in a foreign culture, and students in the ambiguity-induced situation were able to become more entrepreneurial and develop entrepreneurial self-efficacy by coping with the novelty [34]. The study implicitly indicated that negative emotional arousal such as fear is negatively associated with self-efficacy [34], which may, in turn, affect entrepreneurial learning. Although these studies did not specifically focus on individuals' intolerance of uncertainty and entrepreneurial mindset, they indicate that ambiguity and uncertainty do lead to emotional arousal, but coping well with such emotionally laden situations provides opportunities to enhance entrepreneurial competence. Since intolerance of uncertainty entails negatively reacting to uncertain situations, the following hypotheses are considered.

**Hypothesis 3 (H3).** *Prospective anxiety, a sub-factor of intolerance of uncertainty, will have a negative correlation with entrepreneurial mindset.*

**Hypothesis 4 (H4).** *Inhibitory anxiety, a sub-factor of intolerance of uncertainty, will have a negative correlation with entrepreneurial mindset.*

### 1.2.3. Entrepreneurial Mindset and Career Adaptability

There is growing interest and recognition in the industry as well as academia of the importance of entrepreneurial mindset [20]. Entrepreneurial mindset can be defined as “a cognitive perspective that enables an individual to create value by recognizing and acting on opportunities, making a decision with limited information, and remaining adaptable and resilience in conditions that are often uncertain and complex” [20] (p. 6). Since entrepreneurial mindset is associated with an array of facets and characteristics, there have been various attempts to assess it using different measurements, but Jung and Lee [35] developed and validated the College Students’ Entrepreneurial Mindset Scale (CS-EMS) specifically to assess the entrepreneurial mindset of college students. The scale was developed to reflect the goals and outcomes of entrepreneurship education in Korean higher education, through which the five sub-factors of entrepreneurial mindset can be fostered, and the identified factors include innovativeness, need for achievement, risk-taking, autonomy, and proactiveness [35]. Since mindset is not static, but develops over time [16], it can be influenced by the environment and the context in which the individuals are situated [36]. Moreover, it can be trained, learned, and developed via education [15,37]. Thus, the influence of entrepreneurial mindset has been examined in different disciplines, such as the field of engineering [38] and creative and performing arts [39]. Accordingly, enhancing entrepreneurial mindset through entrepreneurship education would benefit individuals, within and outside of the business domain, by helping them to navigate through the challenges of the uncertain world, seeking more opportunities and creating new values.

Since entrepreneurial mindset is understood as cognitive adaptability under uncertain conditions [15], it can be viewed as a universally applicable competence that can be taught and developed [40], and there are studies examining entrepreneurial mindset in relation to other general career-related factors. For instance, Rodriguez and Lieber [41] found that entrepreneurship education led to a significant increase in entrepreneurial mindset, and the entrepreneurial mindset gains were positively associated with perceptions of future career success. Baek and colleagues [18] found a significant effect of entrepreneurship on career decision-making self-efficacy and career maturity. In a study examining the role of entrepreneurship and resilience in Korean college students [42], it was found that, among the sub-factors of entrepreneurship, innovation and risk-taking showed a positive association with challenge-taking behavior while initiative and risk-taking had a positive relation with career preparation, with resilience having a mediating role between risk-taking and challenge-taking behavior and career preparation. Thus far, however, there is no study examining the relation between entrepreneurial mindset and career adaptability.

Career adaptability is a psychosocial construct emphasized in career construction theory that refers to individuals’ self-regulatory strengths and competency, which allow them to cope with vocation tasks, transitions, and traumas [19]. It is a multidimensional construct composed of four resources: concern, referring to being interested in and planning for career-related issues and challenges; control, which involves identifying the possible impact one can have on one’s own career; curiosity, defined as an exploration of possible selves and career-related information; and confidence, indicating the belief that one is able to tackle career-related challenges [43,44]. Career adaptability has been found to increase job satisfaction and lower job stress [45] and have a positive relation with job search self-efficacy and employment status [46]. It also has a more general influence on wellbeing, such as happiness [47], sense of power, and life satisfaction [48], as well as responses to adversity [49]. Career adaptability has been gaining attention as the labor market becomes more complex and unpredictable, especially in the context of the prolonged COVID-19 pandemic [21]. To empirically investigate the relation between entrepreneurial mindset and career adaptability, the following hypothesis is tested in the current study.

**Hypothesis 5 (H5).** *Entrepreneurial mindset will have a positive relation with career adaptability.*

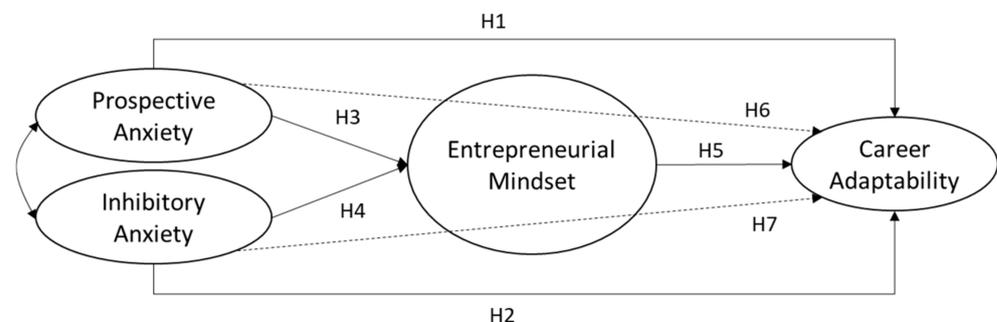
#### 1.2.4. The Role of Entrepreneurial Mindset between Intolerance of Uncertainty and Career Adaptability

The mediating role of entrepreneurial mindset in the relationship between intolerance of uncertainty and career adaptability will be examined. Because intolerance of uncertainty is defined as a predisposition, it is usually viewed as a risk factor leading to various pathologies and symptoms of psychological distress, such as anxiety disorder, depression [50–52], and worry [53], and cognitive–behavioral interventions have been emphasized in dealing with intolerance of uncertainty to increase tolerance and to prevent the vicious cycle leading to worry or general anxiety disorder [54]. Although entrepreneurial mindset is not an intervention specifically designed to target intolerance of uncertainty, it is a cognitive ability that allows individuals to adjust and adapt in a precarious context. In order to add evidence to the entrepreneurial mindset research, the present study hypothesized, albeit with limited support, that such cognitive adaptability may play a mediating role, leading intolerance of uncertainty to further adaptability in the context of careers.

**Hypothesis 6 (H6).** *Entrepreneurial mindset will mediate the relation between prospective anxiety and career adaptability.*

**Hypothesis 7 (H7).** *Entrepreneurial mindset will mediate the relation between inhibitory anxiety and career adaptability.*

Figure 1 illustrates the proposed model for testing Hypotheses 1 through 7 (H1–H7). The solid lines demonstrate a direct relationship between variables (H1–H5) while the dotted lines depict the mediating effects of entrepreneurial mindset (H6–H7).



**Figure 1.** Proposed path analysis model for the intolerance of uncertainty, entrepreneurial mindset, and career adaptability.

## 2. Materials and Methods

### 2.1. Participants

In December 2020, when the COVID-19 was at its peak in Korea, we administered an online survey to the college students who are enrolled as the nation-wide college-student panel of an online survey institute in Korea. A screening question was used to identify juniors and seniors, and data from a total of 361 respondents were collected as a part of a large dataset designed to investigate the career development of students in a transition period. In this study, we included only those who responded that they were actively seeking a job, and the resulting number was 274. Table 1 provides the characteristics of the participants. They were 24.21 (S.D. = 1.21) years old on average, 56.6% were female (male: 43.4%) and 72.6% were seniors (juniors: 27.4%). The major composition was 35.8% of liberal arts and social sciences, 27.0% of natural sciences and engineering, 19.7% of economics and business, 9.9% of medical and pharmacology, 6.2% of arts and kinesiology, and 1.5% of undefined areas.

**Table 1.** Descriptive statistics of the intolerance of uncertainty items.

Subscale	Item	Mean	S.D.	Skew.	Kurt.
Prospective	IU1	2.89	0.70	−0.35	0.19
	IU2	2.94	0.68	−0.25	0.01
	IU3	3.04	0.65	−0.35	0.46
	IU4	2.83	0.73	−0.22	−0.18
	IU5	3.12	0.76	−0.41	−0.57
	IU6	2.52	0.80	0.16	−0.46
	IU7	2.74	0.78	−0.34	−0.18
Inhibitory	IU8	2.59	0.78	−0.21	−0.33
	IU9	2.66	0.75	−0.21	−0.21
	IU10	2.69	0.74	−0.32	−0.05
	IU11	2.45	0.73	−0.10	−0.31
	IU12	2.80	0.70	−0.30	0.11

## 2.2. Measurement

### 2.2.1. Intolerance of Uncertainty Scale

Carleton and colleagues [55] devised the Intolerance of Uncertainty Scale-Short Form (IUS-SF), with two factors—prospective and inhibitory anxieties. The Cronbach's  $\alpha$ s of the whole scale, the prospective anxiety, and inhibitory anxiety were 0.91, 0.85, and 0.85, respectively [55]. In the current study, we used the Korean version of the IUS-SF, which was measured with a 4-point Likert scale (1: strongly disagree–4: strongly agree) as in Kim's study [56]. Kim reported the Cronbach's  $\alpha$  of the whole scale, and it was 0.84.

### 2.2.2. College Students' Entrepreneurial Mindset Scale

Entrepreneurial mindset was measured by the College Students' Entrepreneurial Mindset Scale (CS-EMS), which was recently developed and validated by Jung and Lee [35]. The CS-EMS includes 19 items and contains 5 sub-factors of innovativeness (6 items), need for achievement (4 items), risk-taking (3 items), autonomy (3 items), and proactiveness (3 items). Each item was measured using a 5-point Likert scale (1 = strongly disagree~5 = strongly agree). Jung and Lee [35] reported that the Cronbach's  $\alpha$  reliability coefficients were 0.88, 0.83, 0.88, 0.77, and 0.80 for innovativeness, need for achievement, risk-taking, autonomy, and proactiveness, respectively, while that of the whole scale was 0.94. They also found evidence of construct validity for the five-correlated factor model for the CS-EMS in addition to the predictive validity for start-up intention. Later, Jung and Lee [57] investigated the measurement equivalence of the CS-EMS across the groups based on gender, major, and educational experience, and they found that it holds strict invariance across gender and educational experiences while holding scalar invariance across major.

### 2.2.3. Career Adapt-Ability Scale (CAAS)

To measure the participants' career adaptability, we used the Career Adapt-Ability Scale [43], which was translated into Korean and validated with Korean college students [44,58]. It consists of 24 items, which were created based on four sub-constructs: concern (6 items), control (6 items), curiosity (6 items), and confidence (6 items). The response options for each item were Likert-type, with five categories (1 = not strong~5 = strongest). In Tak's study [44], the originally supported five-correlated factor model across 13 countries held for 273 Korean college students as well. The Cronbach's  $\alpha$  reliability coefficients of the four subscales ranged from 0.80 to 0.93 in Tak's study [44] while those in Jeong's [58] ranged from 0.71 to 0.90.

## 2.3. Analytic Procedure

In the preliminary analysis phase, we examined the distribution of the item-level and subscale-level data and correlations among the main variables of interest (i.e., prospective anxiety (PA), inhibitory anxiety (IA), entrepreneurial mindset (EM), and career adaptability

(CA)) using Jamovi 1.2.27. In the main analysis phase, we investigated the following: (1) the psychometric properties of the intolerance of uncertainty (IU), EM, and CA in terms of construct validity and internal consistency reliability (i.e., Cronbach's  $\alpha$ ); (2) the relationships among PA, IA, EM, and CA under a structural equation modeling framework; and (3) the mediating effect of EM between either PA or IA and CA. More detailed procedures for each analysis are presented below.

### 2.3.1. Psychometric Analysis

Although IU, EM, and CA have been validated before, it is necessary to report sample-specific validity evidence and reliability for each empirical study [59,60]. In the current study, we examined the evidence of the construct validity for both measurements under a confirmatory factor analysis (CFA) framework. Using Jamovi version 1.6.23, we tested the two-correlated factor model for the 12 IU items based on Carleton et al.'s study [55] while testing the five-correlated factor model for EM, which was supported in Jung and Lee's study [35] (detailed information regarding the correlated-five factor model is available in Jung and Lee [57]). For CA, we tested the correlated-four factor model, which was supported by Savickas and Porfeli [43] and Tak [44]. The tested CFA models were evaluated using both chi-square ( $\chi^2$ ) fit statistic and alternative fit indices (CFI: the comparative fit index; RMSEA: root mean square of approximation; and SRMR: the standardized root mean squared residual). However, we relied more on the alternative ones than the  $\chi^2$  fit statistic, which is prone to reject an acceptable model with minor deviation given a large sample [61,62]. We considered a CFA model adequate given the following criteria: CFI  $\geq$  0.90; RMSEA  $\leq$  0.08; and SRMR  $\leq$  0.08 [61,63,64]. After having examined the acceptability of the CFA models, Cronbach's  $\alpha$ s were calculated for the whole scales and every subscale of the CS-EMS and CAAS to investigate internal consistency reliability using Jamovi 1.6.23.

### 2.3.2. Path Analysis

The relations among IU—specifically the two sub-factors of PA and IA—EM, and CA were investigated using the path analysis model under the structural equation model (SEM) framework. We applied the same criteria for the adequacy of the path model as those for the confirmatory factor analysis models: CFI  $\geq$  0.90; RMSEA  $\leq$  0.08; and SRMR  $\leq$  0.08 [61,63,64]. Then, we investigated the path coefficients in the model and  $R^2$ s.

We also tested the mediation effect of EM between either PA or IA and CA using a bootstrap confidence interval following the recommendations of Preacher and Hayes [65]. A statistically significant mediation effect is evidenced by a bootstrap confidence interval that does not include zero at a given confidence level (e.g., 95% confidence interval). All analyses were conducted using MPlus 8.0.

## 3. Results

### 3.1. Descriptive Statistics and Correlation Analysis

#### 3.1.1. Item-Level Descriptive Statistics

Table 1 exhibits the mean, standard deviation (S.D.), skewness (Skew.), and Kurtosis (Kurt.) for each of the 12 IU items. The mean scores ranged from 2.45 (S.D. = 0.73) to 3.12 (S.D. = 0.76). For all items, the skewness (range:  $-0.41$ ~ $0.16$ ) and kurtosis values (range:  $-0.57$ ~ $0.46$ ) were within the criteria for normal distribution suggested by George [66].

Table 2 displays the descriptive statistics of EM items. The item EM14 under the autonomy subscale had the lowest mean score (Mean = 2.96; S.D. = 1.10) while the item EM4 under the innovativeness subscale had the largest mean score (Mean = 3.74; S.D. = 0.92). For EM items, the skewness values and kurtosis values were between  $-0.54$  and  $0.08$  and between  $-0.84$  and  $0.35$ , respectively, and none of the items appeared to violate normal distribution based on the criteria in George [66].

**Table 2.** Descriptive statistics of the entrepreneurial mindset items.

Subscale	Item	Mean	S.D.	Skew.	Kurt.
Innovativeness	EM1	3.22	1.05	−0.10	−0.66
	EM2	3.09	1.00	0.08	−0.60
	EM3	3.63	0.80	−0.30	0.35
	EM4	3.74	0.92	−0.41	−0.20
	EM5	3.40	0.90	0.01	−0.49
	EM6	3.16	0.96	−0.01	−0.46
Need for Achievement	EM7	3.60	0.85	−0.35	−0.06
	EM8	3.24	0.94	−0.16	−0.12
	EM9	3.56	0.89	−0.31	0.01
	EM10	3.61	0.86	−0.47	0.07
Risk-taking	EM11	3.38	0.92	−0.21	−0.53
	EM12	3.19	0.93	−0.05	−0.49
	EM13	3.19	0.93	−0.07	−0.43
Autonomy	EM14	2.96	1.10	−0.02	−0.84
	EM15	3.39	1.00	−0.10	−0.73
	EM16	3.63	0.87	−0.22	−0.36
Proactiveness	EM17	3.45	0.86	−0.54	0.33
	EM18	3.25	0.91	−0.07	−0.27
	EM19	3.35	0.91	−0.29	0.04

The descriptive statistics of CA items are presented in Table 3. The item CA7 under the control subscale had the lowest mean score (Mean = 3.47; S.D. = 0.98) while the item CA2 under the concern subscale had the largest mean score (Mean = 4.15; S.D. = 0.85). The skewness and kurtosis values of them were between −0.96 and −0.23 and between −0.15 and 1.28, respectively. All the CA items could be considered normally distributed according to George's [66] criteria.

**Table 3.** Descriptive statistics of the career adaptability items.

Subscale	Item	Mean	S.D.	Skew.	Kurt.
Concern	CA1	3.99	0.84	−0.74	0.77
	CA2	4.15	0.82	−0.96	1.19
	CA3	3.60	0.94	−0.48	0.13
	CA4	3.68	0.89	−0.59	0.43
	CA5	3.65	0.90	−0.50	0.19
	CA6	3.95	0.88	−0.81	0.74
Control	CA7	3.47	0.98	−0.39	−0.02
	CA8	3.89	0.84	−0.55	0.26
	CA9	3.87	0.80	−0.45	0.23
	CA10	3.81	0.84	−0.48	0.21
	CA11	3.69	1.00	−0.64	0.03
	CA12	3.80	0.84	−0.55	0.43
Curiosity	CA13	3.81	0.78	−0.46	0.55
	CA14	3.73	0.88	−0.54	0.35
	CA15	3.89	0.93	−0.72	0.36
	CA16	3.85	0.82	−0.78	1.28
	CA17	3.71	0.87	−0.35	−0.15
	CA18	3.66	0.88	−0.35	−0.11
Confidence	CA19	3.65	0.82	−0.23	−0.12
	CA20	3.69	0.79	−0.33	0.14
	CA21	3.75	0.86	−0.50	0.07
	CA22	3.76	0.81	−0.47	0.37
	CA23	3.59	0.88	−0.48	0.23
	CA24	3.71	0.79	−0.48	0.50

### 3.1.2. Subscale-Level Descriptive Statistics and Correlation among the Subscale Scores

Table 4 provides the descriptive statistics of the main variables for the path analysis. The subscale scores were created by averaging out the scores of all items belonging to each of the subscales for IU. The scale scores for EM and CA were calculated by averaging out all the items belonging to each of the scales. The mean scores of the PA and IA were 2.86 (S.D. = 0.45) and 2.60 (S.D. = 0.56), respectively. For the EM and CA, the mean scores were 3.39 (S.D. = 0.57) to 3.79 (S.D. = 0.56), respectively. The skewness values (range:  $-0.61 \sim -0.06$ ) and the kurtosis values (range:  $0.29 \sim 1.87$ ) indicated that all variables were reasonably normally distributed [66].

**Table 4.** Descriptive statistics of the PA, IA, EM, and CA.

Variable	Mean	S.D.	Skew.	Kurt.
Prospective Anxiety	2.86	0.45	-0.11	0.80
Inhibitory Anxiety	2.60	0.56	-0.38	0.29
Entrepreneurial Mindset	3.39	0.57	-0.06	0.72
Career Adaptability	3.79	0.56	-0.61	1.87

The bivariate correlations among PA, IA, EM, and CA are shown in Table 5. PA had a significant bivariate correlation with both EM ( $r = 0.13, p < 0.05$ ) and CA ( $r = 0.24, p < 0.001$ ) in a positive direction, which was not what we had expected. However, IA was negatively correlated with both EM ( $r = -0.20, p < 0.01$ ) and CA ( $r = -0.17, p < 0.01$ ) as we expected. The correlation between EM and CA was statistically significant and in a positive direction ( $r = 0.63, p < 0.001$ ).

**Table 5.** Bivariate correlations among the PA, IA, EM, and CA.

Variables	1	2	3	4
1 Prospective Anxiety	-			
2 Inhibitory Anxiety	0.56 ***	-		
3 Entrepreneurial Mindset	0.13 *	-0.20 **	-	
4 Career Adaptability	0.24 ***	-0.17 **	0.63 ***	-

Note. \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

## 3.2. Psychometric Analysis

### 3.2.1. Confirmatory Factor Analysis

The confirmatory factor analysis results are shown in Table 6. Since all item-level variables were found to be normally distributed, we used the maximum-likelihood estimation method for evaluating the models and estimating the model parameters [61,67]. For the two-correlated factor model for IU, the chi-square fit statistic ( $\chi^2_{(df=51)} = 144.00, p < 0.001$ ) was statistically significant, whereas the other fit indices (CFI = 0.907; RMSEA = 0.054; SRMR = 0.071) consistently indicated that the model was adequate. Although the chi-square fit statistic ( $\chi^2_{(df=142)} = 439.0, p < 0.001$ ) indicated that the five-correlated factor model for the EM did not perfectly fit the data, the other fit indices congruently indicated that the model was acceptable (CFI = 0.906; RMSEA = 0.076; SRMR = 0.063). Similarly, the four-correlated factor model for the 24 career adaptability items was considered acceptable based on the alternative fit indices (CFI = 0.923; RMSEA = 0.065; SRMR = 0.045) even though the chi-square fit statistic was significant ( $\chi^2_{(df=244)} = 614.00, p < 0.001$ ). Hence, the construct validity for the Intolerance of Uncertainty Scale, College Students' Entrepreneurial Mindset Scale, and the Career Adapt-Ability Scale was supported with the sample of the current study.

**Table 6.** Confirmatory factor analysis results.

Scale	$\chi^2$	df	p-Value	CFI	RMSEA	SRMR
Intolerance of Uncertainty	144.00	51	<0.001	0.907	0.054	0.071
Entrepreneurial Mindset	439.00	142	<0.001	0.906	0.076	0.063
Career Adaptability	614.00	244	<0.001	0.923	0.065	0.045

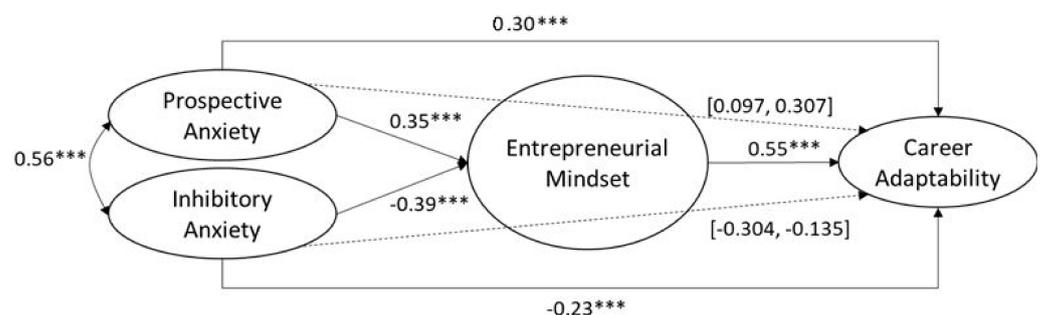
### 3.2.2. Internal Consistency Reliability

The internal consistency reliability (Cronbach's  $\alpha$ ) was 0.82 at the whole scale level for the Intolerance of Uncertainty scale, while those of the prospective and inhibitory subscales were 0.71 and 0.74, respectively. The Cronbach's  $\alpha$  reliability coefficient of the College Students' Entrepreneurial Mindset Scale as a whole was 0.91, while those for the innovativeness, need for achievement, risk-taking, autonomy, and proactiveness subscales were 0.83, 0.80, 0.81, 0.79, and 0.77, respectively. For the Career Adapt-Ability Scale, the whole scale's Cronbach's  $\alpha$  reliability coefficient was 0.95, while those for the concern, control, curiosity, and confidence subscales were, respectively, 0.87, 0.84, 0.82, and 0.87. All Cronbach's  $\alpha$  reliability coefficients indicated good to excellent internal consistency and reliability [68,69].

### 3.3. Path Analysis

We used the maximum-likelihood estimation method for the path analysis model because all variables in the model were normally distributed [61,67]. The tested path model was a just-identified model in which the model fit indices were no longer meaningful.

As illustrated in Figure 2, the standardized path coefficient from PA to CA was in a positive direction ( $\beta = 0.30$ ; SE = 0.06,  $p < 0.001$ ), which indicated that Hypothesis 1 was rejected. The standardized path coefficient from IA to CA was in a negative direction ( $\beta = -0.23$ ; SE = 0.06,  $p < 0.001$ ), which supported Hypothesis 2. The standardized path coefficient from PA to EM was in a positive direction ( $\beta = 0.35$ ; SE = 0.08,  $p < 0.001$ ), which implied that Hypothesis 3 could not be sustained. The standardized path coefficient from IA to EM was in a negative direction ( $\beta = -0.39$ ; SE = 0.07,  $p < 0.001$ ), which indicated that Hypothesis 4 was supported. Finally, the standardized path coefficient from EM to CA was in a positive direction ( $\beta = 0.55$ ; SE = 0.05,  $p < 0.001$ ), which meant that Hypothesis 5 was supported.

**Figure 2.** Path analysis results for the PA, IA, EM, and CA. \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

The  $R^2$  of CA was 0.46, which implied that approximately 46.0% of the variance of the CA was explained by PA, IA, and EM. The  $R^2$  of EM was 0.12, which indicated that approximately 12.9% of the variability in the EM was accounted for by PA and IA.

The standardized indirect effect of PA through EM to CA was 0.19 (SE = 0.05;  $p < 0.001$ ) with a 95% bootstrapping confidence interval (BS-CI) of [0.097, 0.307], which indicated that EM had a significant partial mediation effect between PA and CA. Thus, Hypothesis 6 was supported. The standardized indirect effect of IA through EM to CA was -0.216 (SE = 0.04;  $p < 0.001$ ) with a 95% bootstrapping confidence interval (BS-CI) of [-0.304,

−0.135], which indicated a significant partial mediation effect of EM between IA and CA, supporting Hypothesis 7.

## 4. Discussion and Conclusions

### 4.1. Findings and Implications

The purpose of the current study was to examine the relations among intolerance of uncertainty—consisting of prospective anxiety and inhibitory anxiety—career adaptability, and entrepreneurial mindset, with a specific focus on determining the mediating role of entrepreneurial mindset between intolerance of uncertainty and career adaptability. There are several implications of the study.

One of the most notable results was the positive correlation that prospective anxiety had with career adaptability and entrepreneurial mindset. The authors had hypothesized that the two sub-factors of intolerance of uncertainty, namely prospective anxiety and inhibitory anxiety, would have different degrees of relationship with other variables, albeit with the same directionality. Inhibitory anxiety showed an inverse association with career adaptability and entrepreneurial mindset as hypothesized, but the results for prospective anxiety were contrasting. Previous studies have found that intolerance of uncertainty has a negative association with career adaptability [31,32], as well as other positive variables such as mental wellbeing [23] and positivity [24], but these studies did not examine the sub-factors separately. The seven items of IUS-SF assessing prospective anxiety reflect individuals' inclination to actively seek information to reduce uncertainty and their preference for predictability about the future [28,55], and the responses may also have reflected the participants' level of planning or preparedness.

It should also be noted that individuals' perceived uncertainty was found to be related to the development of entrepreneurial competencies, such as increased uncertainty/ambiguity tolerance and self-efficacy [33,34]. Although these previous studies did not directly link intolerance of uncertainty and entrepreneurial mindset, it may tentatively be suggested that a certain level of fear and anxiety about the future may lead to cognitive adaptability and adaptive resources. Furthermore, in a study conducted by Reuman and colleagues [70], it was found that, when the uncertain aspects of a situation were made more explicit or obvious rather than merely implied, individuals perceived the situation as more anxiety-provoking and were more inclined to perform a safety behavior. Thus, in the current study, the participants may have perceived uncertainty as implied or tacit, perceiving their situation as being less anxiety-provoking. However, these remain the authors' tentative suggestions. Further study is needed to provide evidence and explanation for the results of the current study, regarding the positive relation between prospective anxiety and career adaptability and entrepreneurial mindset.

In the current study, it was found that entrepreneurial mindset was significantly and strongly related to career adaptability. In previous studies, entrepreneurial mindset had been mostly investigated in relation to the outcomes regarding the intention to create a new venture [71,72] or actual venture-creating-related behaviors [73–75]. Although there are few studies that have identified the relation between entrepreneurial mindset and other career-related variables, such as perceived future career success [41], career decision-making self-efficacy and career maturity [18], and career preparation [42], this is the first study, to the best of the authors' knowledge, that has directly identified the positive relationship between entrepreneurial mindset and career adaptability. This result is significant in that it provides the initial groundwork for future studies to determine the role of entrepreneurial mindset in the general career development process.

Furthermore, the mediating effect of entrepreneurial mindset between intolerance of uncertainty and career adaptability also illustrates the importance of cultivating an entrepreneurial mindset in the uncertain era. The prolonged COVID-19 pandemic may continue to impact the level of individuals' intolerance of uncertainty, which has been found to be closely related to generalized anxiety disorder or major depressive disorder [51]. Previous studies have focused on the cognitive-behavioral approach, targeting intolerance

of uncertainty as a treatment for generalized anxiety disorder [76] or reduction of anxiety or depressive symptoms [77], and found the treatment to be effective. However, these cognitive-behavioral interventions targeted intolerance of uncertainty in order to treat other emotional disorders. For individuals who are not in the clinical setting, other approaches are needed in order for them to deal with uncertainty and better adapt to the changing environment. The results of the present study initiate a discussion that entrepreneurial mindset and cognitive adaptability may be an approach to enable individuals to tolerate uncertainty and adjust to the precarious world to which they are exposed in the context of their career. Thus, a well-designed entrepreneurship education focusing on cultivating an entrepreneurial mindset may work as an effective cognitive measure for individuals to gain tolerance of uncertainty and increase career adaptability.

In Korea, entrepreneurial education has been gaining interest in higher education as well as in elementary, middle, and high schools. However, education that merely focuses on fostering entrepreneurs and generating venture start-ups has not led to actual changes in the economy [7]. More emphasis is being placed on entrepreneurship education that can develop an entrepreneurial mindset that would lead to positive outcomes in general career development [57]. The current study is significant in that it provides evidence for the extended role of entrepreneurial mindset in relation to career adaptability in the context of uncertainty.

#### *4.2. Limitations and Directions for the Future Research*

The present study is limited in that it examined the relations among intolerance of uncertainty, entrepreneurial mindset, and career adaptability using cross-sectional data. In order to further investigate the causal relations among the variables, longitudinal and experimental research is necessary. Moreover, the participants of the study were restricted to Korean college students facing school-to-work transition. Although the study provides a better understanding of the role of entrepreneurial mindset in the educational and economic context of Korea, future study is required to compare and contrast different cultural aspects in order to generalize the results. Moreover, the study did not investigate the relations among the sub-factors of entrepreneurial mindset and career adaptability. Since there is a limited number of studies directly examining the relations among the variables, the initial purpose of the current study was to add to the existing literature by providing supporting evidence for their relations. However, further study should be conducted to identify the specific roles and relations that each sub-factor may have. Finally, the present study could not fully explain why prospective anxiety showed positive relations with entrepreneurial mindset and career adaptability. Although a few assumptions were made by the authors, they should empirically be tested to clarify the effect of prospective anxiety in the context of entrepreneurship education and career development.

Despite the limitations, the current study is significant in that it identified the relationship between entrepreneurial mindset and career adaptability, extending the scope of influence that entrepreneurial mindset has on general career development. In addition, it provided supporting evidence for the mediating effect of entrepreneurial mindset on the relationship between intolerance of uncertainty and career adaptability, providing practical implications for future entrepreneurship education.

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