Role of Decision-Making Styles and Intolerance of Uncertainty on Procrastination During the Pandemic

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Decisional procrastination in university students is affected by several factors that could hinder its reduction and, among these factors, the styles of decision-making and the tolerance of uncertainty have been poorly investigated during the pandemic. This study analyzed the associations of procrastination with decision-making styles and intolerance of uncertainty in 209 freshmen of Degrees in Psychology at the University of Catania (Italy). The Decisional Procrastination Scale, the Decision-Making Styles, and the Intolerance of Uncertainty Scale were used. Results: 1) decisional procrastination is associated positively with doubtfulness, and proxy, but negatively with no problem style; 2) decisional procrastination is strongly related both to prospective and inhibitory intolerance of uncertainty; 3) decision-making styles (doubtfulness, and proxy) are positively related both to prospective and inhibitory intolerance of uncertainty; finally, 4) no problem style is negatively associated both with prospective and inhibitory intolerance of uncertainty. The expected results indicated that freshmen who procrastinate in their decisions during the pandemic are likely to use dysfunctional decision-making styles and are oriented toward the unacceptability of uncertainty.

Keywords: procrastination, decision-making, uncertainty, freshmen

INTRODUCTION

Studies concerning the factors directly correlated to procrastination have examined personality traits (conscientiousness and neuroticism) (Chowdhury, 2016; Abood, et al., 2019; Zhou, 2020), perfectionism and locus of control (Boysan & Kiral, 2017), task aversiveness and fear of failure (Afzal & Jami, 2018; Zhang & Feng, 2020; Rahimi & Hall, 2021), self-control and self-regulation (Ramzi & Saed, 2019), self-leadership strategies (Wang, et al., 2021), group work and feeling for academic procrastination (Hen & Goroshit, 2020; Koppenborg & Klingsieck, 2022), difficulties with time management (Irwansyah, et al., 2021). Very few studies have explored the influence of decision-making styles and intolerance of uncertainty on procrastination in university students during the pandemic, realizing only correlations between procrastination and decision-making styles or between procrastination and intolerance of uncertainty (Orellana-Damacela, et al., 2020; Ferrari & Dovidio, 2000; Yildiz & Eldeleklioglu, 2021). Several bibliographical sources indicate that more than 50% of university students claim to procrastinate in a problematic manner, about 70% of them judged themselves as chronic procrastinators, and 75% of them

consider themselves habitual procrastinators. During the pandemic, these data showed an exponential increase and some studies reported that most students experienced high levels of anxiety, negative emotions, confusion, low subjective well-being, and anger during this turbulent time (Brooks, et al., 2020; Wang & Zhao, 2020; Rahimi & Vallerand, 2021). The writing of a paper right before the deadline, the completion of the thesis, the delayed beginning of a task perceived as particularly difficult, and the postponing of preparation for an exam represent the most common behaviors of procrastinators in the academic context. So, the contribution of this paper adds new results in the literature to promote the best practices in the academic context reducing the tendency to procrastinate by university students during a situation of emergency, and, in particular, by freshmen, knowing the influence of decision-making styles and tolerance of uncertainty on the decisional procrastination during the pandemic by COVID-19.

Procrastination and Its Definitions

As reported by Lay (1986), the phenomenon of procrastination is considered as the act of unwontedly delaying tasks to the point of experiencing a subjective uncomfortable feeling or putting off something that which is necessary to reach some objectives and it corresponds with the intentional postponing any task even with the awareness of its consequences. Other relevant definitions of procrastination are offered by Ferrari and colleagues (Ferrari, 1994) who said that it is "the purposive delay in the beginning and/or completion of an overt or covert act, typically accompanied by subjective discomfort" (Ferrari, et al., 1998, p. 281) and by Steel (2007) according to which the procrastination is the act "to voluntarily delay an intended course of action despite expecting to be worse off for the delay" (p. 66). Among the different types of procrastination behaviors (arousal, decisional, avoidant, passive, and active), decisional procrastination is considered the most problematic one for individuals because of their lack of ability to decide within a specified time period (Ferrari, et al., 2007); it is recognized as a cognitive mechanism delaying the decision-making process to cope with stressful situations, useful to reduce psychological pressure when individuals handle different situations (Pychyl, et al., 2000). For this type of procrastination, individuals intentionally choose to accomplish other tasks considered or judged as less demanding for them, tend to underestimate the time required to complete the task, believing that they will meet the deadlines. They experience low achievement and reduced physical or psychological well-being (Ferrari & Pychyl, 2000; Habelrih & Hicks, 2015), high levels of anxiety, lack of self-esteem, and successful time management (Ferrari, 1994; Onwuegbuzie, 2004; Pychyl & Sirois, 2016), low positive affectivity (Sagone et al., in press), and deficits in self-discrepancy (Orellana-Damacela, et al., 2020). This evidence demonstrated how this type of passive procrastination has negative consequences on the life of individuals who delay decisions-making and tasks completion. In opposition to this perspective, a type of functional procrastination, defined as "active procrastination", reveals a recurrent behavior that encourages success at work and acts as a positive strategy toward established goals that generally produces high achievement at work (Chu & Choi, 2005; Kandermir & Palanci, 2014). As reported by Habelrih and Hicks (2015), in a sample of 152 Australian university students, active procrastination is the best predictor of high psychological well-being rather than passive procrastination. In addition, Sagone and colleagues (in press) found strongly negative relations between the passive procrastination and eudaimonic well-being in Italian sample of 300 psychology university students. Lastly, Orellana-Damacela and colleagues (2020) observed that "individuals are more likely to procrastinate when they are confronted with a goal that they have to accomplish (a duty), than when confronted with a goal that they want to reach (a wish)" (p. 236).

Styles of Decision-Making

Decision-making style has been notoriously described by Scott and Bruce as "the learned habitual response pattern exhibited by an individual when confronted with a decision situation. It is not a personality trait, but a habit-based propensity to react in a certain way in a specific decision context" (Scott & Bruce, 1995, p.820). These authors identified five styles of decision-making comparable to those analyzed by Mann et al. (1997): 1) the rational style, characterized by the search for and deliberate evaluation of possible alternatives (see the vigilance); 2) the intuitive style, defined by attention to details, tendency to make quick decisions, and to rely on own feelings (see the hyper-vigilance); 3) the dependent style, referred to the

search for and confidence on the help of the other people (see the buck-passing style); 4) the avoidant style, considered as the tendency to avoid and postponing decisions (see the procrastination); and 5) the spontaneous style, described by a feeling of immediacy and the desire to finish the decision-making process quickly.

In all moments of life, it is very important for individuals to have efficient decision-making skills and adequate self-confidence in decision-making processes for overcoming the possible and critical issues. At the same time, making decisions that possess various alternatives reveals more difficulties and negative effects during the choices to be made (Mann, et al., 1997). Individual differences and psychological factors may also influence the decision-making processes (Shiloh, 2001; Yi & Park, 2003). Concerning to this perspective, in a large group of 492 Turkish university students, Deniz (2006) observed that decision self-esteem and all decision-making styles are significantly correlated with life satisfaction; further, life satisfaction is positively correlated with both problem-focused coping and seeking social support, and coping with stress is associated both with decision self-esteem and decision-making styles. As well as, in a sample of 360 Indian university students, Rahaman (2014) found that two personality factors (that is, openness to experience and conscientiousness) positively predict the style of vigilance, while neuroticism negatively predicts the same decision-making style; further, the factors of extraversion and openness to experience negatively predict the buck-passing style, while neuroticism positively predicts the same style; lastly, neuroticism and conscientiousness differently predict the procrastination style. Among the types of decision-making styles analyzed by widespread literature (Scott & Bruce, 1995; Savickas, 2003), we have noted the presence of the following styles (Freeston, et al., 1994) highly consistent with the rationale of our investigation: 1) "doubtfulness", consisting in the emotional interference regarding choices, negative affectivity, doubt, and uncertainty; 2) "proxy", concerning the attribution to other people the responsibility of choice and an external locus of control; 3) "delay", regarding to the inclination to avoid or delay the beginning of decisional process; finally, 4) "no problem", relating to the ability to establish goals, arrange actions, check for information, and take into account the alternatives scrupulously. Among the different decisional styles, decisional procrastination assumes an important function, orienting individuals to ignore problems and delay choices for as long as possible. It is considered as a dysfunctional mechanism generating a lack of success or producing instability: so, individuals generally experience precarious and inconsistent activity (Carleton, et al., 2007). With reference to the psychological literature, people who obtain high levels of decisional procrastination tend to use inefficient decision-making styles, are easily distractible and less systematic in their decisions, highly dissatisfied with their life, and look for additional information linked to the possible alternatives before taking a decision (Ferrari & Dovidio, 2000).

Tolerance of Uncertainty

Another threatening factor the decision-making process is given by intolerance of uncertainty (Birrell, et al., 2011; Carleton, 2016; Jacoby, et al., 2014). It has been considered by Birrell and colleagues (2011) constituted by two components simultaneously concerning the "desire for predictability and active engagement in seeking certainty" and the "paralysis of cognition and action in front of uncertainty" (p.1198). More recently, Carleton (2016) defined the intolerance uncertainty as the "individual's dispositional incapacity to endure the aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty" (p.31). So, people with a high intolerance to uncertainty in the decision-making processes show a growing emotional worry and anxiety during the decision-making (Xu & Hu, 2018), use negative coping strategies (Fourtounas & Thomas, 2016), and, consequently, tend to procrastinate (Dugas, et al., 2004; Ladouceur, et al., 1997). Individuals perceived and respond to unpredictable situations when report high levels of intolerance of uncertainty and when face with the ambiguity of information about circumstances (Dugas, et al., 2005). Furthermore, as stated by Dugas and colleagues (2005), individuals with high levels of intolerance of uncertainty are sensitive to uncertainty and, according to Jensen and colleagues (2014), those with high intolerance of uncertainty experience a reduced decision-making confidence in front of the necessity to decide in various situations. Additionally, the university students who scored high in self-esteem decision-making reach high happiness and cognitive flexibility, as well as low intolerance of uncertainty and greatly

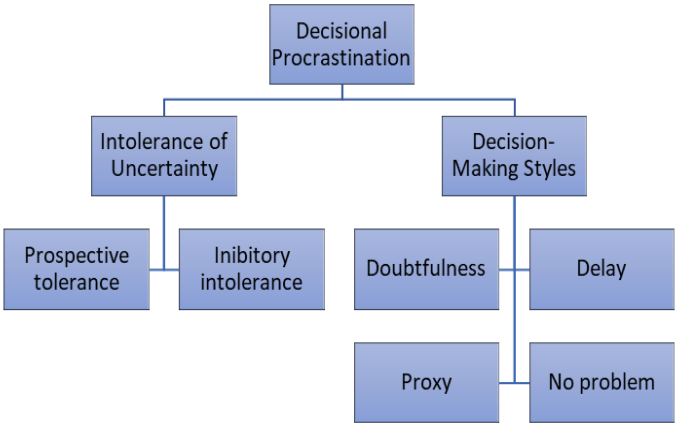
use the decision-making style linked to vigilance; further, students who tend to use the hyper-vigilance and procrastination are less happy, cognitively inflexible, and tolerant of uncertainty (Yildiz & Eldeleklioglu, 2021). The intolerance of uncertainty has been mainly analyzed in vulnerable people with emotional disorders, psychopathology, and somatic anxiety (Shihata, et al., 2016; Pawluk & Koerner, 2016; Sternheim, et al., 2017; Shapiro, et al., 2020; Ferrari & Dovidio, 2000) in which the tendency toward uncertainty is poorly tolerated. On the other hand, few studies have examined this phenomenon in people without psychological disorders or emotional disease and this reason has supported the current exploratory study in the Sicilian context with healthy freshmen. So, the tendency to procrastinate in students has been analyzed in relation to the styles of decision-making (Sagone & Indiana, 2021; Mansouri, et al., 2021) and the intolerance of uncertainty (Ferrari, et al., 1995), even if these correlations need further deepening.

METHODOLOGY

Hypothesis

The main purpose of this study is to analyze the influence of intolerance of uncertainty and decisional-making styles on decisional procrastination during the pandemic in Sicilian freshmen attending the Degree courses of Psychology at University of Catania in Italy (Figure 1). We hypothesized that: (H_1) freshmen who score high in the intolerance of uncertainty will procrastinate their decisions; (H_2) freshmen who use dysfunctional decision-making styles will postpone what to do and how to do it.

FIGURE 1
THE RESEARCH DESIGN



Participants

The convenience sample of 209 freshmen (mainly females: n=189, 98%) was chosen from the mandatory courses for Degrees in Psychological Sciences and Techniques at the University of Catania, Department of Educational Sciences (Sicily, Italy). The mean age of the sample was 18.7, sd= 0.77 (range 18-22). They came from different cities of Sicily (Enna, Syracuse, Messina, Caltanissetta, and Ragusa). Freshmen did not receive any remuneration for participating. The exclusion criterion was to have psychopathology or psychological disorders in the past or actual period of life. This study was realized during the pandemic in the months of March-April 2022.

Measures

The Decisional Procrastination Scale (DPS: Nota & Soresi, 2000) is a single-factor measure of the tendency to procrastinate a decision within a given period of time (during the pandemic). We used the Italian version of DPS adapted by Nota and Soresi (2000), composed by five items assessed using a 5-point Likert scale ranging from 1 (equal to “not at all true of me“) to 5 (equal to “always true of me“). Freshmen

were asked to indicate to what extent they were engaged in various strategies when taking decisions: e.g., "I waste a lot of time on trivial matters before getting to the final decision"; "Even after I make a decision, I delay acting upon it". The internal consistency of the DPS has been determined by Cronbach's alpha equal to 0.77.

The Decision-Making Styles Questionnaire (DMS: Di Nuovo & Magnano, 2013) is a self-report measure used for exploring the styles of doubtfulness, delay, proxy, and no problem. The original version is formed by 15 items, each assessed with a 5-point Likert scale from 1 (corresponding to totally disagree) to 5 (totally agree). Freshmen were asked to point out the extent to which they deal with different types of decisions in everyday life. Examples of items are as follows: When I have to decide or a choice that is important for me … "I feel worried and I try to put off the choice" (doubtfulness); "I'm afraid of making mistakes and ask my parents to decide in my place" (proxy or delegation); "I already have clear ideas and I am sure what to choose" (no problem). For this study, we decided to analyze three factors of this scale, instead of four, eliminating the delay since it evaluates the same factor of procrastination measured in the DPS with similar statements. Cronbach's alpha for each subscale has been calculated on the sample of this study: doubtfulness, $\alpha = 0.81$; proxy, $\alpha = 0.78$; no problem, $\alpha = 0.61$. This last value of alpha is relatively lower than the others but considered still within an acceptable range (Cortina, 1993).

The Intolerance of Uncertainty Scale (IUS-12: Jacoby, et al., 2014; Walker, et al., 2010; Bottesi, et al., 2015) assesses the reactions to uncertainty, the responses to ambiguous situations, and the beliefs about the future during the pandemic. Each item is rated with a 5-point Likert scale from 1 (= not at all characteristic of me) to 5 (= entirely characteristic of me). We applied the Italian adaptation with 12 items (IUS-12) by Bottesi and colleagues (2015), excluding one item with a reduced saturation coefficient in the previous study (<0.23). It measures two highly correlated factors, named as "prospective intolerance of uncertainty" (factor1: 6 items; $\alpha = 0.84$) and "inhibitory intolerance of uncertainty" (factor2: 5 items; $\alpha = 0.86$). Examples of items are as follows: for prospective intolerance, "It frustrates me not having all the information I need" and "I always want to know what the future has in store for me"; for inhibitory intolerance, "The smallest doubt can stop me from acting" and "I must get away from all uncertain situations". The internal consistency of the IUS has been tested by Cronbach's alpha equal to 0.89.

Data collection was carried out in the period of the COVID-19 pandemic at A.Y. 2021-22. Participation of psychology freshmen students was voluntary, and formal consent was obtained before starting the study. The Ethical Code for Italian psychologists (L. 18.02.1989, n.56), Legislative Decree for the privacy of data (DLGS 196/2003), and the Ethical Code for Psychological Research (27 March 2015) established by the Italian Psychologists Association were respected by the researchers. The study was performed according to the guidelines of the Declaration of Helsinki and approved by IERB (Internal Ethic Review Board of Psychology Research), Department of Educational Sciences, University of Catania.

Data Analysis

Statistical analyses were performed using IBM SPSS 20 with the application of the correlations with Pearson's coefficient and multiple regressions to analyze the influence of decisional-making styles and intolerance of uncertainty on decisional procrastination. Descriptive analyses (mean and standard deviation) were reported in the main discussion of results. The median-split method was used to divide the entire sample in two groups of freshmen with high and low scores in DPS, respectively; it is more adequate for an asymmetrical distribution than the mean value in order to drift at the central tendency since it is much more robust and parsimonious. The choice of this method is supported by the indications provided by DeCoster, Iselin, and Gallucci (2011), Iacobucci, et al. (2015a; 2015b), and, more recently, by Rozental, et al. (2022).

RESULTS

Descriptive analyses indicated that freshmen show high levels of decisional procrastination (16–86 range T-scores for girls: M = 63.8; 16-88 range T-scores for boys: M = 71.8),without relevant differences between boys and girls, and mainly use a functional and useful decisional style of no problem (total sample:

M = 3.61, sd = 0.70), contrary to proxy (total sample: M = 1.69, sd = 0.74) rarely adopted by our sample. For the intolerance of uncertainty, freshmen reported high levels of IUS-prospective (6-30 range, M = 19.02, sd = 5.8) and IUS-inhibitory (5-25 range, M = 12.8, sd = 5.1). This meant that most parts of freshmen avoid delegating to others their choices and the realization of tasks or academic activities, even if they are likely to procrastinate their decisions to make and express low tolerance of the uncertainty.

Dividing the sample for levels of decisional procrastination (DPS) using the median split method, we obtained that 54.1% of freshmen are low procrastinators (n=113), while 45.9% are high procrastinators (n=96). Analyzing the differences for these two groups of freshmen (see Table 1), results indicated the highest means of doubtfulness and proxy in high procrastinators, while the highest means of no problem in low procrastinators, even if the effect size poorly support these differences (with Cohen's d < .20). Further, the highest means of prospective and inhibitory intolerance of uncertainty are obtained by high procrastinators, as confirmed by the effect size (Cohen's d = .73 and d =.98, respectively).

TABLE 1
DIFFERENCES FOR LEVELS: DMS AND IUS

Variables	DPS	N	Mean	sd	T-test (Sig.)
DMS-Doubtfulness	Low	113	2.43	.87	-8.18 (p<.001)
	High	96	3.41	.86	
DMS-Proxy	Low	113	1.46	.56	-4.90 (p<.001)
	High	96	1.95	.83	
DMS-No problem	Low	113	3.85	.67	5.62 (p<.001)
	High	96	3.34	.62	
IUS-Prospective	Low	113	17.39	5.36	-4.65 (p<.001)
	High	96	20.95	5.67	
IUS-Inibitory	Low	113	10.73	4.37	-7.11 (p<.001)
	High	96	15.26	4.82	

Referring to the relationships between decisional procrastination (DPS) and decision-making styles (DMS)(see Table 2), the main results of this exploratory study demonstrated that DPS is associated positively and strongly with doubtfulness and proxy, but negatively with no problem style; it means that the more the freshmen tend to procrastinate their decisions, the more they use styles of decision-making characterized by lack of clarity in their actions and tendency to mandate their choices to other people.

TABLE 2
CORRELATION MATRIX BETWEEN DPS AND DMS

Variable		Doubtfulness	Proxy	No problem
Decisional	*r*	.602**	.451**	-.395**
procrastination	*Sig.*	.000	.000	.000

About the association between decisional procrastination (DPS) and intolerance of uncertainty (IUS)(see Table 3), results showed that procrastination is positively related both to prospective and inhibitory intolerance of uncertainty; as expected, the more the freshmen procrastinate their decisions, the more they assume high intolerance of uncertainty both in the factor of desire for predictability and for that of the uncertainty paralysis.

TABLE 3
CORRELATION MATRIX BETWEEN DPS AND IUS

Variables		IUS-Prospective	IUS-Inibitory
Decisional procrastination	*r*	.390**	.515**
	Sig.	.000	.000

Additionally, the decision-making styles and the two components of tolerance of uncertainty are significantly correlated among them (see Table 4). So, the more the freshmen are likely to use the doubtfulness and proxy as dysfunctional styles of decision-making, the more they perceive the uncertainty as intolerable. On the opposite trend, the more the freshmen use the adequate style of decision-making to overcome the problems, activating the search for valid solutions, the less they manage and control the intolerance of uncertainty.

TABLE 4
CORRELATION MATRIX BETWEEN DMS AND IUS

Variables		IUS-Prospective	IUS-Inibitory
DMS-Doubtfulness	*r*	.594**	.659**
	Sig.	.000	.000
DMS-Proxy	*r*	.429**	.520**
	Sig.	.000	.000
DMS-No problem	*r*	-.282	-.424
	Sig.	.000	.000

According to general hypothesis about the influence on decisional procrastination by the two correlated constructs (decision-making and uncertainty), multiple regression indicated that doubtfulness and inhibitory intolerance of uncertainty positively affect decisional procrastination (see Table 5).

TABLE 5
MULTIPLE REGRESSION FOR DECISION PROCRASTINATION (DPS) – TOTAL SAMPLE

Model	*R*	*Adjusted R^2 Square*	*F*	*Sig.*	Coefficients		
					β	*t*	*Sig.*
Doubtfulness					.393	4.564	<.001
Proxy					.099	1.425	.156
No problem	.632	.385	27.005	<.001	-.080	-1.240	.216
Prospective intolerance of uncertainty					-.026	-.357	.721
Inhibitory intolerance of uncertainty					.187	2.322	.021

a. Dependent variable: decisional procrastination (DPS)
b. Predictors: (Constant) doubtfulness style, proxy style, no problem style, IUS-prospective, IUS-inhibitory

DISCUSSION

The main purpose of the present study is to analyze the influence of decision-making styles and intolerance of uncertainty on decisional procrastination mainly widespread in freshmen without psychopathology or psychiatric disorders. The analysis of literature revealed the lack of studies carried out with samples of freshmen in relation to the examined constructs, even if the majority of scholars have discovered that this population procrastinates more than other people (Lay, 1986; Steel, 2007; Ferrari & Pychyl, 2000).

Consistently with the H_1, results of this study confirmed that freshmen who score high in the intolerance of uncertainty procrastinate their decisions more than the others; it means that the more the freshmen are involved in doubtful, threatening, and undesirable situations, regardless of the tangible probability of a negative event to happen, the more they tend to delay their decisions about the course of events or the activities to do. This result is very significant also for the direct and indirect influence of COVID-19 and in line with Aucejo, et al.'s (2020) and Lim and Javadpour's recent researches (2021): these scholars underlined that the uncertain climate generated by this pandemic has caused negative psychological consequences in university students and the procrastination for the uncertainty experienced by students increased. The pandemic variable has been excluded by the authors of the current study because of the impossibility to carry out a pre-COVID/post-COVID comparison on the examined constructs in freshmen; however, it is possible to imagine that this unexpected and forced condition of isolation, with the concomitant reduction of daily routines, has distorted the meaning of "uncertainty" and intensified the "aversiveness to activities"; as a result, this unpredictable condition has increased the procrastination behaviors with the academic context. As verified by Doğanülkü and colleagues (2021) in a recent study of with a sample of Turkish students, the fear of COVID-19 positively correlates with intolerance of uncertainty and procrastination, and the intolerance of uncertainty assumes a relevant mediating role in the relationship between fear of COVID-19 and procrastinating behaviors in university students. Consequently, these authors conclude that the control of fear of the coronavirus and the increase of tolerance of uncertainty could be considered useful and functional mechanisms for reducing the individuals' procrastination.

Confirming the H_2, the freshmen who use dysfunctional decision-making styles tended to postdate the tasks to do and how to do them; it means that the more the freshmen adopt strategies of decision-making ineffective for solving critical situations, the more they tend to procrastinate their choices about the realization of activities or the planning of behaviors to be adopted in various situations such as the academic context. Also in this case, these evidences are in line with the previous results found by Handayani and Andromeda (2017), Sagone and Indiana (2021), but incoherent with those of Santosa (2017); for instance, in the same academic context, Sagone and Indiana (2021) found that the more the university students tend to procrastinate their decisions, the more they are likely to adopt dysfunctional decision-making styles, and the doubtfulness and the delay are predominantly used by the Italian university students attending the Psychology and Pedagogy degree courses. On the contrary, the findings of Santosa revealed an insignificant inverse relationship between decision-making styles (measured using the GDMSQ: Scott, et al., 1995) and academic procrastination (analyzed with the APS: McCloskey & Scielzo, 2015).

Finally, for completing the general analysis of this study about the correlation between the decision-making styles and the two components of tolerance of uncertainty, the results show that the freshmen who are prone to use the doubtfulness and proxy as dysfunctional decisional styles perceive the uncertainty as widely intolerable. Furthermore, the freshmen who use the style of decision-making to overcome the problems and to activate the search for valid solutions (that is, no problem style) adequately manage and control their intolerance of uncertainty. These results are in line with the outcomes of Yildiz and Eldeleklioglu (2021) with a sample of Turkish university students (including the freshmen and predominantly females).

According to regression analysis, the results indicated that only one style of decision-making (that is, doubtfulness) and the inhibitory intolerance of uncertainty positively affected decisional procrastination: it means that the freshmen who adopt a style characterized by doubts and emotional interference regarding their choices tend to poorly tolerate the uncertainty. This evidence confirmed the results obtained by Ferrari

and Dovidio (2000), Sagone and Indiana (2021), and Mansouri et al. (2021). For instance, Mansouri et al. (2021) found that decisional procrastination can be predicted by self-compassion, fear of failure, and intolerance of uncertainty in a sample of 440 Iranian post-graduate students. Ferrari and Dovidio (2000) noted that students who are highly decision-making procrastinators are systematic and strategic, but they seek more information about the alternatives chosen rather than being unsystematic and easily distracted in their information searches; additionally, the students with high indecision (used as synonymous of decisional procrastination) were less able to shift with "functional efficiency"' across different situations and tasks (p.128).

Limitations and Conclusion

To the knowledge of the authors, this study is the first attempt at analyzing the relationships among decisional procrastination, intolerance of uncertainty, and decision-making styles in a sample of freshmen, providing interesting suggestions about the direction of these connections. However, there are some limitations that need to be addressed.

First, the female freshmen were overrepresented in this convenience sample and the generalizability of the findings for the male ones is debatable. The authors are aware that it will be necessary to balance the number of participants for gender in the next researches with regard to these topics for examining the differences between males and females in procrastination (confirmed by Mandap, 2016; Ozer, Demir & Ferrari, 2009), decision-making styles (as in Bajwa, et al., 2016), and intolerance of uncertainty (for instance, in Dugas, et al., 2001). For example, as reported by Mandap (2016) and Basith (2021), male university students tend to procrastinate more than the female ones. As well as, Bajwa (2016) found that females use more rational decision-making style and show more intuitive decision-making ability than males. Additionally, in a recent validation study of the Brazilian version of the Intolerance of Uncertainty Scale, Kretzmann and Gauer (2020) examined that females obtain higher scores both in the inhibitory and prospective intolerance of uncertainty than males.

Second, the choice of senior university students, rather than that of only freshmen, could be considered as a variable influencing the effects of intolerance of uncertainty and decision-making styles on decisional procrastination; in addition, the rate of procrastination in senior university students could be different from that of freshmen at the start of the same course of study. As found by Onwuegbuzie (2004), the graduate students demonstrate a greater tendency to procrastinate the academic tasks (reading assignments and studying for exams) than the undergraduate ones; on the contrary, Özer (2011) discovered that the undergraduate students are likely to procrastinate more than the graduate ones on writing term papers, studying for exams, and reading weekly assignments. Similar findings are observed by Rahimi and Hall (2021): the undergraduate students report greater perceived frequency of procrastination than the graduate ones with respect to studying for exams. In addition, Cao (2012) pointed out that, among the undergraduate procrastinators, the younger students were more likely to engage in behaviors of active procrastination, while the older ones tended to engage in passive procrastination.

Third, the authors used a median split on the DPS for differentiating the freshmen with high procrastination from those with low procrastination and for making the interpretation of results of this first study accessible also to a broad audience. Median splits tend to give the best results when the original variable is normally and symmetrically distributed (Cohen, 1983) and this fact can legitimate the use of both the mean and the median as measures of central tendency. In this study, the original variable given by the mean scores of freshmen on DPS is asymmetrically distributed with the right-skewed data; for this reason, to avoid the exclusion of borderline cases from the total sample, the authors adopted the median as the best representative value of the central location of the data. As suggested, the more skewed is the distribution of continuous variables, the more is the difference between the median and mean value, and extensive emphasis should be placed on the use of the median in opposition to that of the mean. While knowing that the scientific literature agrees on the inadequacy of the median splits as a practice for dichotomizing a continuous variable (in this case, the decisional procrastination), sometimes criticized for the loss of information and reduction in its strength, some studies broke up this criticism considerably

(DeCoster, et al., 2011; Iacobucci, et al., 2015a; 2015b; Rozental, et al., 2022) by showing that it is a robust method.

Future research could examine the effects of other variables in these relationships, such as optimistic orientation and self-efficacy in academic performances, useful to arrange training programs in academic context for the freshmen who could live the transition from high school to university with several difficulties in the new lifestyle cycle (Clariana, et al., 2012). Additionally, it will be very interesting to compare freshmen with senior students in the same academic context for considering the role of time management during the pandemic inside of the course of study. Finally, it will be very attractive to divide the university students into three groups, high (HP), average (AP), and low procrastinators (LP), creating different psychological profiles of university students coping with the phenomenon of academic procrastination during the actual pandemic and its correlates (tolerance of uncertainty and decisional styles), as suggested by the qualitative study of Visser, Korthagen, and Schoonenboom (2018) and that of Rozental and colleagues (2022). At the end of this paper, the main outcome emerging from these results suggests to organize focus groups about the understanding of the psychological meanings of "uncertainty" during the situation of emergency for university students and at the start of their vocational career.

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