

Title

Decision-making associated with anxiety and depression among emerging adults.

Abstract

Emerging adulthood is synonymous with high levels of stress and uncertainty, often resulting in anxiety and depression, which negatively impact mental health and well-being. Exploring the experiences of anxiety and depression symptomology in decisional situations enhance our understanding their role in emerging adult mental health and well-being. This study examined whether decision-making styles predict anxiety and depression symptomology among emerging adults in South Africa. The cross-sectional study collected data using a secure, online platform. All data were analysed using R for descriptive and inferential statistics. Partial Least Squares Structural Equation Modelling was performed using R seminr package. The sample consisted of 1 411 emerging adults with a mean age of 21.81 years, who engaged in both adaptive and maladaptive decision-making. Among the participants, 74.2% were at risk of a clinical diagnosis for an anxiety disorder, and 37.3% for depression/mood disorder. Structural equation modelling indicated that adaptive decision-making led to a reduction in anxiety and depression symptomology, while maladaptive decision-making had the opposite effect. The findings highlight implications for emerging adult mental health, particularly how understanding the connections with decision-making can enhance intervention outcomes and improve mental health and mental health literacy among emerging adults in South Africa.

Keywords

Anxiety; decision-making; depression; emerging adult; mental health.

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Traditionally, the shift from adolescence to adulthood was straightforward. However, in recent times, this transition has become more complex (Shanahan, 2000). This increased complexity is driven by evolving societies and developmental changes (Shanahan, 2000), leading to the recognition of a new developmental period known as “emerging adulthood”. Emerging adulthood, spanning the ages of 18 to 29 years (Arnett, 2014), possesses unique characteristics due to the complexities arising from changing societies (Arnett, 2007). These societal changes include transformations in traditions, cultures, institutions, and roles.

This development period is marked by physical and sexual maturity, coupled with instability in relationships, work, and education, driven by the evolving societal landscape (Arnett et al., 2014). The complexity of these societal changes has led to gaps in researchers' and practitioners' knowledge about the health and development of emerging adults, as well as the factors that influence these aspects (Marder et al., 2022). Emerging adults in South Africa face unique challenges that significantly impact their health and well-being. These challenges include socio-economic and political issues such as poverty, high levels of violence, and limited educational opportunities (Bantjes et al., 2023; Bantjes et al., 2022). Additionally, these challenges are multisystemic, encompassing biological, psychological, social, structural, and environmental stressors (Fouché et al., 2024). Effective decision-making has the potential to promote the health and well-being of emerging adults.

Decision-making is an important component of emerging adulthood, with the potential to result in either adaptive or maladaptive outcomes. A myriad of decision-making styles exist that can inform how emerging adults engage in decision-making. Janis and Mann (1977) proposed four decision-making styles: vigilant, hypervigilant, and defensive avoidant, which includes buck-passing and procrastination (Alexander et al., 2017; Davids et al., 2016). *Vigilant decision-making* involves thoroughly examining all potential alternatives or solutions to a decisional situation (Urieta et al., 2021). Individuals using this style feel optimistic about finding a satisfactory alternative. Vigilant, or adaptive, decision-making often results in positive outcomes, while maladaptive decision-making (namely, hypervigilant, buck-passing, and procrastination) results in negative outcomes. *Hypervigilant decision-making* occurs when emerging adults are initially optimistic about finding an alternative but become stressed due to time constraints, leading to hasty decisions without thorough consideration of all options. *Defensive avoidant* decision-making includes buck-passing, where emerging adults shift the responsibility of making a decision to someone else, and procrastination, which involves postponing the decision to a later time (Alexander et al., 2017; Urieta et al., 2021).

The decision-making styles employed by emerging adults can act as either risk or protective factors for mental health. The relationship between decision-making styles and mental health outcomes in emerging adults is not well understood, given the limited research available (Bavolar & Bacikova-Sleskova, 2020). Understanding whether certain decision-making styles are associated with risk or protective factors for mental health, such as anxiety and depression symptomology, could inform policies and programmes designed to promote positive mental health outcomes for emerging adults. To the best of our knowledge, this is the first South African study for this age group to examine the role of decision-making styles in predicting anxiety and depression symptomology.

Bavolar (2023) has proposed a conceptual framework suggesting that individual decision-making styles are habitual processes used when faced with a situation that requires a decision to be made. This process of selecting an alternative is influenced by emotional, cognitive, and motivational factors, leading to the decisional outcome, which, in this study, relates to the mental health of emerging adults, specifically anxiety and depression symptomology.

The way emerging adults make decisions can either increase or decrease the anxiety and depression symptomology experienced. These symptoms can arise due to the complexity and uncertainty associated with decision-making situations. Mental health disorders and associated symptomology often begin in late adolescence and continue throughout the transition to emerging adulthood. Nearly 75% of mental health disorders have their onset by the age of 25 (Kessler et al., 2007), with more than a 40% prevalence of any psychiatric disorder onset during emerging adulthood (Arnett et al., 2014; Kessler et al., 2005). Anxiety and mood disorders are the most prevalent among emerging adults (Arnett et al., 2014; Kessler et al., 2005). In South Africa, emerging adults have a reported prevalence of 37.1% for anxiety disorders and 16.3% for mood disorders (Bantjes et al., 2023), shaped by various internal and external stressors (Schulenberg et al., 2004). Anxiety and/or depression symptomology may result from the anticipated outcomes of decisions made by emerging adults (Morelli et al., 2022). Therefore, the current study aims to examine whether decision-making styles predict anxiety and depression symptomology among emerging adults in South Africa.

Methods

The study employed a cross-sectional design to examine whether decision-making styles predicted anxiety and depression symptomology among emerging adults in South Africa. The methods for the larger study have been published previously with no duplication of results (Davids, 2022).

Participants

The participants in this study were university students attending a higher education institution (HEI) in South Africa, with campuses spread across multiple provinces. This diverse selection aimed to capture the varied demographics of emerging adults in the country. The sample size was determined using the Yamane formula (Yamane, 1967), which estimated a need for 397 participants, factoring in the institution's population size and a 0.05 probability of error. This formula was chosen for its efficiency in ensuring the sample's representativeness.

Ultimately, the study included 1 411 university students (see Table 1), exceeding the initial sample size estimation by 71.86%. These participants had a mean age of 21.81 years (SD= 4.50; 18–33 years), with the majority identifying as female (n= 1030; 73.0%), followed by male (n= 374; 26.5%) and non-binary (n= 7; 0.5%). The sample consisted of emerging adults from eight of the nine provinces in South Africa, with the Gauteng province being the most represented (n= 802; 57.0%) and Free State province the least (n= 7; 0.5%).

Although all students (n= 46 011) at the HEI were invited to participate in the study, only 1 411 voluntarily agreed. Consequently, data on non-participation were not collected. The differences in terms of the sample size represented by each geographic location can be attributed to voluntarily agreeing to partake in the study. Gajda and colleagues (2021) suggest that the impact of having participants volunteer to partake in a study versus random selection is impossible to predict.

Table 1. Demographic details

Variable	n	%	
Mean Age	21.81 years (SD= 4.497)		
Gender	Male	374	26.5
	Female	1 030	73.0
	Non-binary	7	0.5
Province	Eastern Cape	113	8.0
	Free State	7	0.5
	Gauteng	802	57.0
	KwaZulu-Natal	270	19.2
	Limpopo	13	0.9
	Mpumalanga	9	0.6
	North West	11	0.8
Western Cape	183	13.0	

Procedure

The research study obtained ethical approval from the Independent Institute of Education's Research Ethics and Postgraduate Studies Committee. Following this approval, the identified HEI was invited to participate. Permission to access the student population was sought and

granted by the student manager. After consulting with the student manager and the research team, a suitable date and time were decided upon to commence with the study. This timing aimed to minimise disruptions to the HEI's regular academic calendar and daily operations.

The research team collaborated closely with the institution's Computer Applications Team, which facilitated the invitation of the entire student population to participate in the study. To comply with privacy legislation and safeguard the participants' personal information, the Computer Applications Team directly contacted students through the HEI's electronic communications database. At no point during the communication stage of the study or the data collection stage was information or participants' contact details shared with the research team.

To safeguard participant anonymity and confidentiality, measures such as disabling cookies and IP address collectors were implemented. The self-administered questionnaire, consisting of three sections aligned with the study's aim, allowed the participants to complete it at their convenience. The questionnaire remained open for two weeks before data collection ceased. Participants could complete the online questionnaire in approximately 20–30 minutes.

Measures

Data were collected using the self-administered, online questionnaire with all information securely stored in a password-protected cloud space until the end of the study. The questionnaire, conducted in English, comprised three sections:

- Section 1: Demographic details questionnaire: The brief demographic details questionnaire collected information about the participants' self-identified gender, age, and geographical location/province.
- Section 2: Melbourne Decision Making Questionnaire (Mann et al., 1997): This scale consisted of 22 items that were based on Janis and Mann's (1977) conflict model of decision-making. It assessed four decision-making styles, namely *vigilant* (current study $\alpha= 0.79$; 6 items), *hypervigilant* ($\alpha= 0.64$; 5 items), *buck-passing* ($\alpha= 0.79$; 6 items), and *procrastination* ($\alpha= 0.76$; 5 items). Participants responded to items on a scale where 2 = True for me, 1= Somewhat true for me, and 0 = Not true for me. An example item is: 'When making a decision, I prefer to leave decisions to others'. Scores for each decision-making style were calculated using the mean score for the associated items.
- Section 3: Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983): This scale comprised 14 items, with 7 items assessing anxiety (current study $\alpha= 0.82$) and 7 items assessing depression ($\alpha= 0.78$) in the current study. Participants rated their responses on a scale ranging from 0= *Not at all* to 3= *Nearly all the time*, reflecting their feelings over the past week. Widely used in both clinical practice and research, this scale includes items such

as: ‘Worrying thoughts go through my mind ...’. Selected for its ability to assess both anxiety and depression, unlike tools that focus solely on depression, such as the Patient Health Questionnaire, it has been previously validated with emerging adults in South Africa, demonstrating high levels of validity, sensitivity, acceptability, and cultural adaptability (Van der Walt et al., 2020). Each item is scored between 0 and 3, with 3 indicating the highest level of anxiety/depression symptomology. Normal levels of anxiety/depression symptomology were determined by calculating the mean of the summed scores for all items that ranged between 0 and 7, while the at-risk category was determined by calculating the mean of the summed scores for all items that ranged between 8 and 21.

Data analysis

All data were collected online using a secure platform. The data were downloaded, coded, cleaned, and screened for any errors. The coding and cleaning of the data were performed using R. The data analysis included a reliability analysis of the variables to examine Cronbach’s α and item-total correlation. This was followed by an examination of the descriptive statistics, which included determining the means and frequencies of the variables and demographic details to be examined in the study.

The descriptive statistics were followed by running inferential statistics, which included computing Pearson correlations to assess the associations between the variables. This was followed by linear regression analysis, where anxiety and depression were entered as the dependent variables, and the inclusion of decision-making styles in the regression model as predictor variables. Due to the demographic data for self-identified gender, Cohen’s d was calculated. The effects were found to be negligible to small, suggesting that self-identified gender did not have an effect on decision-making styles, as well as anxiety and depression symptomology.

To explore how decision-making styles predict anxiety and depression symptomology among emerging adults in South Africa, Partial Least Squares Structural Equation Modelling (SEM) was performed on the entire sample using the R *sempr* package. Partial Least Squares SEM was chosen for its causal-predictive approach to SEM which puts a strong emphasis on making predictions while estimating statistical models, with structures meant to offer causal insights (Hair et al., 2019; Sarstedt et al., 2017). Missing data were handled using the missing data imputation method, a common method for dealing with missing data.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki and received approval from the Institutional Review Board of The Independent Institute of Education (IIE Reference:

R.15531 on 1 July 2021). Prior to participating, all participants freely and voluntarily agreed to take part in the study and completed written, informed consent forms. A more detailed explanation of the ethical considerations followed in the study is provided in the *Procedure* sub-section.

Results

Preliminary analysis

The results in Table 2 suggest that the sample of emerging adults often engaged in vigilance (M= 1.55; SD= .42) and hypervigilance (M= 1.08; SD= .46) styles of decision-making. When examining mental health, the results indicate that 74.2% (n= 1029; M= 13.04; SD= 3.52) of the sample exhibited anxiety-related symptomology putting them at risk for a clinical diagnosis, while 37.3% (n= 517; M= 11.14; SD= 2.84) showed depression-related symptomology putting them at risk for a clinical diagnosis.

Table 2. Decision-making style, anxiety and depression symptomology prevalence.

Variable		Mean	SD
<i>Decision-making¹</i>			
Vigilance		1.55	.42
Hypervigilance		1.08	.46
Buck-passing		.81	.50
Procrastination		.80	.51
Variable		n	%
<i>Mental Health²</i>			
Anxiety Symptomology	Normal (M= 5.15; SD= 1.72)	357	25.8
	At risk (M= 13.04; SD= 3.52)	1029	74.2
Depression Symptomology	Normal (M= 4.03; SD= 2.06)	870	62.7
	At risk (M= 11.14; SD= 2.84)	517	37.3

¹ Decision-making variables assessed using the following scale: 2= True for me; 1= Somewhat true for me; 0= Not true for me.² Mental health variables were assessed using the following scale, where a total score of 0-7= normal and 8-21= 'caseness' / at risk

Main analysis

The results in Table 3 indicate a significant association between anxiety and depression. When examining anxiety and depression alongside the associations of decision-making, they reveal a significant negative association between anxiety and vigilant decision-making (adaptive decision-making), as well as between depression and vigilant decision-making. Furthermore, significantly positive associations are found between anxiety and maladaptive decision-making (namely, hypervigilant, buck-passing, and procrastination decision-making). Additionally, significantly positive associations are also observed between depression and maladaptive decision-making for emerging adults (see Table 3).

Table 3. Variable correlations.

	1	2	3	4	5	6
1. Anxiety	-					
2. Depression	.645**	-				
3. Vigilance	-.138**	-.221**	-			
4. Hypervigilance	.489**	.405**	-.104**	-		
5. Buck-passing	.339**	.361**	-.252**	.582**	-	
6. Procrastination	.422**	.418**	-.281**	.603**	.700**	-

** correlation significant at 0.01 level (2-tailed).

Among the emerging adults, vigilant decision-making was a significant negative predictor of anxiety symptomology ($\beta = -.049$; $p = .04$; VIF= 1.11). Hypervigilant ($\beta = .359$; $p = .000$; VIF= 1.72) and procrastination decision-making ($\beta = .220$; $p = .000$; VIF= 2.24) were significant positive predictors of anxiety symptomology, whereas buck-passing (VIF= 2.13) was not a significant predictor (see Table 4). The model explained 27.1% of the variance for anxiety symptomology, and the results suggest that the model was a significant predictor ($F(5, 1295) = 97.585$, $p \leq .001$).

Table 4. Regression of anxiety risk on decision-making styles.

<i>Anxiety</i>	<i>b</i>	<i>SE b</i>	β	<i>t</i>	<i>p</i>
(Constant)	0.987				
Vigilance	-.079	.039	-.049	-2.05	.040
Hypervigilance	.518	.044	.359	11.98	.000
Buck-passing	-.046	.045	-.035	-1.04	.390
Procrastination	.285	.044	.220	6.44	.000

Note: Anxiety: $\Delta R^2 = .271$.

Vigilant decision-making was a significant negative predictor for depression symptomology among the emerging adults in the study ($\beta = -.130$; $p = .000$; VIF= 1.11), while hypervigilant ($\beta = .226$; $p = .000$; VIF=1.72) and procrastination decision-making ($\beta = .229$; $p = .000$; VIF= 2.24) were significant positive predictors of depression symptomology. The model explained 22.3% of the variance for depression symptomology, and the results suggest that the model remained significant ($F(5, 1297) = 75.622$, $p \leq .001$) (see Table 5).

Table 5. Regression of depression risk on decision-making styles.

<i>Depression</i>	<i>b</i>	<i>SE b</i>	β	<i>t</i>	<i>p</i>
(Constant)	0.690				
Vigilance	-.186	.036	-.130	-5.23	.000
Hypervigilance	.292	.040	.226	7.25	.000
Buck-passing	.035	.041	.029	.84	.400
Procrastination	.265	.041	.229	6.49	.000

Note: Depression: $\Delta R^2 = .223$.

Measurement model

When evaluating the Partial Least Squares SEM, several criteria and assessments were conducted. The assessment of the reflective measurement model included examining indicator loadings, internal consistency reliability, convergent validity, and discriminant validity (Hair et al., 2019). First, the assessment of the *indicator loadings* for anxiety, depression, and decision-making styles as the latent structures suggests acceptable item reliability (see Figure 1). Secondly, an assessment of the *internal consistency* reliability was determined using composite reliability, where the reliability values were considered satisfactory to good for the latent structures (see Table 6). Additionally, the *convergent validity* was evaluated using the average variance extracted (AVE), all of which were acceptable as they exceeded 0.50 (as seen in Table 7). Lastly, the *discriminant validity* was determined using the heterotrait-monotrait (HTMT) ratio, with these ratios presented in Table 8.

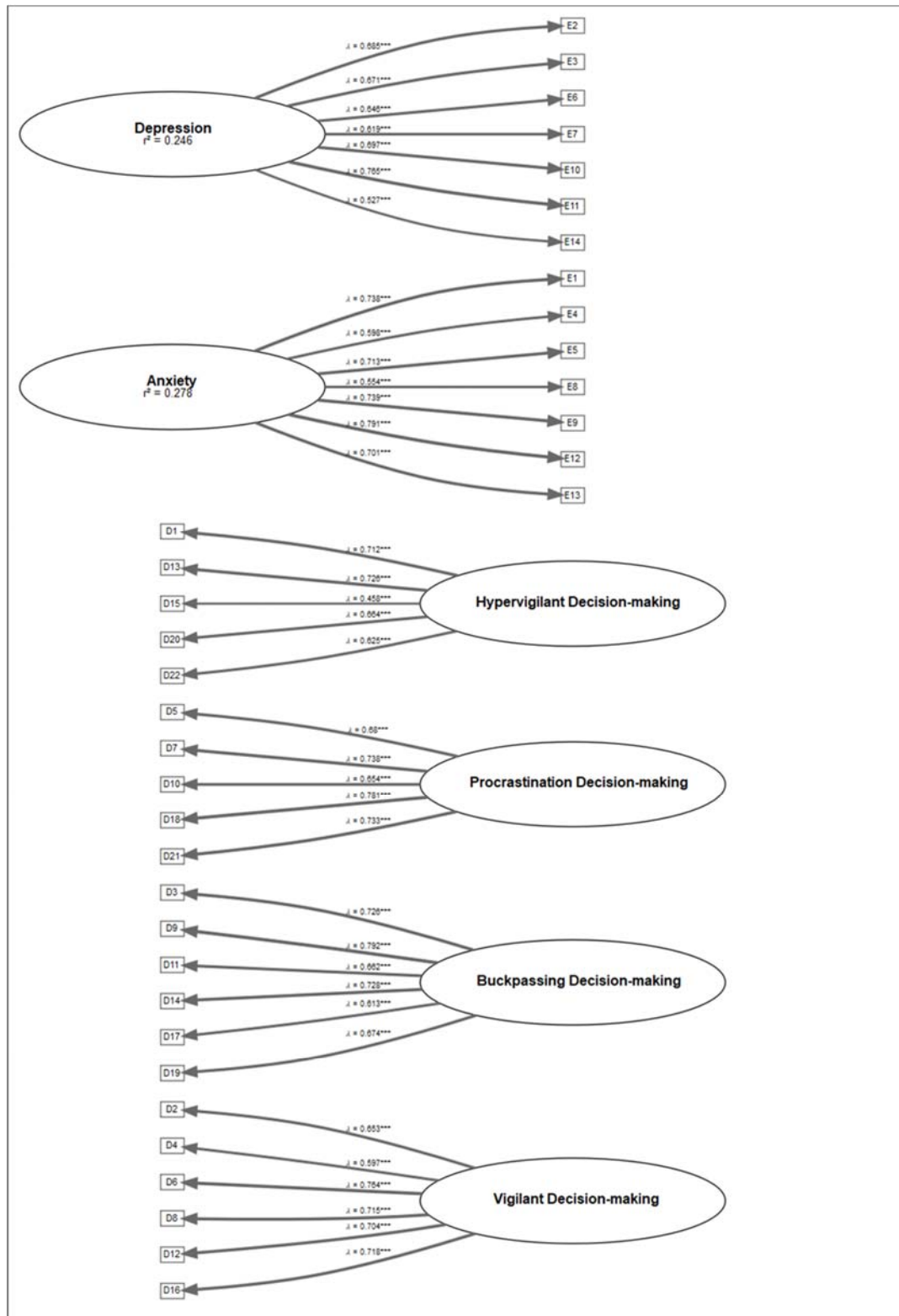


Figure 1. Indicator loadings for measurement model.

Table 6. Latent structure composite reliability.

Latent Structure	Composite Reliability
Vigilant Decision-making	0.85
Hypervigilant Decision-making	0.78
Buck-passing Decision-making	0.85
Procrastination Decision-making	0.84
Anxiety	0.87
Depression	0.84

Table 7. The average variance extracted.

Latent Structure	Average Variance Extracted (95% CI)
Vigilant Decision-making	0.48 (0.45-0.51)
Hypervigilant Decision-making	0.42 (0.40-0.44)
Buck-passing Decision-making	0.49 (0.47-0.51)
Procrastination Decision-making	0.52 (0.49-0.54)
Anxiety	0.48 (0.46-0.50)
Depression	0.44 (0.42-0.46)

Table 8. Heterotrait-monotrait (HTMT) ratios.

Latent Variable 1	Latent Variable	HTMT Ratio
Vigilant Decision-making	Buck-passing Decision-making	0.33
Vigilant Decision-making	Procrastination Decision-making	0.37
Vigilant Decision-making	Hypervigilant Decision-making	0.18
Vigilant Decision-making	Anxiety	0.18
Vigilant Decision-making	Depression	0.28
Buck-passing Decision-making	Procrastination Decision-making	0.89
Buck-passing Decision-making	Hypervigilant Decision-making	0.81
Buck-passing Decision-making	Anxiety	0.42
Buck-passing Decision-making	Depression	0.44
Procrastination Decision-making	Hypervigilant Decision-making	0.85
Procrastination Decision-making	Anxiety	0.53
Procrastination Decision-making	Depression	0.53
Hypervigilant Decision-making	Anxiety	0.67
Hypervigilant Decision-making	Depression	0.55
Anxiety	Depression	0.80

Measurement structural model

Figure 2 and Table 9 show the Partial Least Squares SEM, which indicates that vigilant decision-making negatively influences both anxiety ($\beta = -0.05$; $p = 0.017$) and depression ($\beta = -0.13$; $p < 0.001$) among emerging adults in South Africa, while hypervigilance and

procrastination decision-making positively influence anxiety ($\beta = 0.39, p = <0.001$; $\beta = 0.20, p = <0.001$) and depression ($\beta = 0.25; p = <0.001$; $\beta = 0.22; p = <0.001$) respectively. Buck-passing decision-making does not have a significant influence on anxiety or depression.

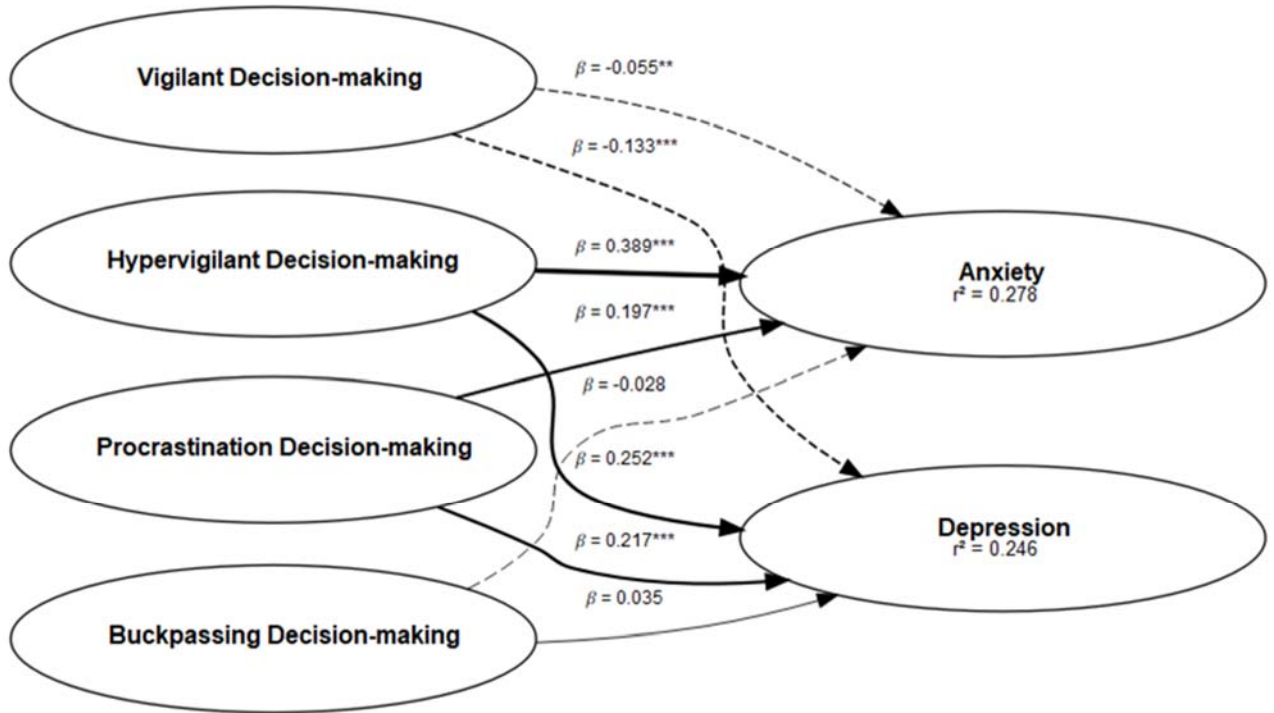


Figure 2. Partial Least Squares Structural Model.

Table 9. Path coefficients from the structural model.

Path	Path Coefficient	95% CI	t	p
Vigilant Decision-making -> Anxiety	-0.05	-0.1 – -0.01	-2.39	0.017
Vigilant Decision-making -> Depression	-0.13	-0.19 – -0.09	-5.22	<0.001
Hypervigilant Decision-making -> Anxiety	0.39	0.33 – 0.44	13.06	<0.001
Hypervigilant Decision-making -> Depression	0.25	0.19 – 0.32	7.55	<0.001
Buck-passing Decision-making -> Anxiety	-0.03	-0.09 – 0.04	-0.88	0.377
Buck-passing Decision-making -> Depression	0.04	-0.03 – 0.10	1.06	0.289
Procrastination Decision-making -> Anxiety	0.20	0.13 – 0.26	5.78	<0.001
Procrastination Decision-making -> Depression	0.22	0.14 – 0.29	5.86	<0.001

Discussion

The study aimed to examine whether decision-making styles predict anxiety and depression symptomology among emerging adults in South Africa. The results indicate that the decision-making styles adopted by emerging adults predicted anxiety and depression symptomology. Vigilant decision-making, or more adaptive forms thereof, corresponded with lower levels of anxiety and depression symptomology. Conversely, maladaptive decision-making styles such as hypervigilance, buck-passing, and procrastination were associated with increased anxiety and depression symptomology.

Globally, significant efforts have been directed towards enhancing mental health, yet a noticeable gap persists in comprehending the mental well-being of the majority of young individuals worldwide (Solmi et al., 2022). Among emerging adults and youth, mental health issues and substance use disorders stand out as the leading causes of years lived with disability on a global scale (Erskine et al., 2014).

Common mental health challenges experienced by emerging adults include emotional distress, encompassing anxiety and depression, and general psychological distress. Research conducted in South Africa suggests that before the COVID-19 pandemic, rates of anxiety and depression among emerging adults were 15.5% and 11.2%, respectively (Bantjes et al., 2016). However, during the pandemic, emerging adults experienced increased rates of anxiety (45.6%) and depression (35.0%) (Visser & Law-van Wyk, 2021). The rates of anxiety and depression symptomology observed in the current study also raise concerns, echoing findings from previous studies in South Africa (Visser & Law-van Wyk, 2021; Bantjes et al., 2016).

Of particular note are the alarming rates of clinical anxiety and/or depression diagnoses within the country. Despite their distinct symptomology, anxiety and depression are frequently diagnosed comorbidly as disorders (Bantjes et al., 2023). Elevated levels of depression symptomology may prompt clinical diagnoses of mood disorders, characterised by emotional or affective outcomes, placing individuals at risk for clinical diagnoses of anxiety-related disorders. Moreover, anxiety-related disorders often precede or co-occur with diagnoses of depression.

Paulus and Yu (2012) highlight complexities and limitations within the existing body of knowledge, which pose challenges in examining decision-making and its associations with anxiety and mood-related symptomology. The findings of the current study suggest that decision-making styles significantly influence mental health outcomes. In essence, rates of

anxiety and depression symptomology are linked to subsequent decision-making processes and mental health outcomes.

The decision-making process employed by emerging adults, as delineated by Janis and Mann (1977) in their conflict model of decision-making, underscores the importance of evaluating and assessing all alternatives when confronted with decisional situations. Failure to identify risky alternatives may be correlated with diminished mental health outcomes for health and development, or risky alternatives may be overlooked due to the decision-making style employed, thereby increasing the likelihood of maladaptive mental health outcomes. As emerging adults assume greater responsibility and self-reliance, they encounter more independent decision-making opportunities, often leading to increased stress and subsequent vulnerability to anxiety and depression-related symptomology (Marder et al., 2022).

Katahira and colleagues (2011) previously suggested that the mental health outcome, or anxiety and depression symptomology, in a decisional situation, could either: (i) inform the distress experienced as a result of the decision-making alternative selected (acting as the cause), or (ii) shape the mental health outcome of subsequent behavioural choices or decision-making processes (acting as the symptom). The emerging adults in the current study engaged in both adaptive and maladaptive forms of decision-making. The latter was significantly associated with anxiety and depression symptomology, with 74.2% at risk of a clinical diagnosis of an anxiety-related disorder and 37.3% for depression or mood-related disorder. Further examination revealed that only hypervigilant and procrastination decision-making were significant predictors of anxiety and depression symptomology among emerging adults. Vigilant (or adaptive) decision-making was a significant negative predictor for anxiety and depression symptomology.

The results indicate that when faced with a decisional situation, emerging adults tend to opt for a decision process or alternative that could influence their mental health outcomes (namely, anxiety or depression symptomology). These mental health outcomes are closely intertwined with the distress experienced, essentially reflecting the mental health of the emerging adult. Furthermore, these outcomes may also influence subsequent behaviours or decision-making processes as a consequence of their mental health impact (see Figure 3).



Figure 3. Diagram illustrating emerging adult decision-making as a cause or symptom of anxiety and depression.

In interpreting the results of the current study alongside insights from literature and theory, guided by Figure 3, it is evident that when faced with a decision-making situation, an emerging adult's response to the available information plays a crucial role. Vigilant decision-making entails thorough evaluation of all available alternatives, leading to a reduction in anxiety and depression symptoms, as depicted in Figure 3. Conversely, hypervigilant decision-making, driven by time concerns, or procrastination, deferring decisions, heightens anxiety and depression symptomology. This escalation in symptoms elevates the risk of clinical diagnoses of anxiety or depression.

The outcome, whether it leads to a decreased or heightened risk for mental health issues, can influence the levels of distress experienced and guide future behaviours or decision-making processes concerning mental health outcomes (see Figure 3). Ultimately, the mental health outcome is shaped by two processes within the field of judgement and decision-making: (i) *Emotional valence*, which refers to the extent to which emotions can be categorised as positive or negative. This can result in either (a) *integral emotions*, which are emotions that arise from decision-making and shape subsequent decision-making and choices, or (b) *incidental emotions*. The latter refers to emotions experienced in one situation and carried forward to the next decisional situation, impacting the decision-making process (Lerner et al., 2015). On the other hand, (ii) *arousal* refers to the intensity with which emotions are experienced, breaking down the emotion to understand both the content of the decision-making process and thoughts (Lerner et al., 2015). Recognising the decision-making process of emerging adults as influenced by either emotional valence or arousal aligns with the findings of Davids et al. (2021), who noted that the decision-making of young individuals is shaped by the synergistic interplay of affective and rational processes.

Considering the results of the current study, it is evident that when faced with a decisional situation, emerging adults may opt for a decision process or alternative that could lead to a mental health outcome (namely, anxiety or depression symptomology). This interaction between decision-making and mental health outcomes (namely, anxiety or depression symptomology) can also be bi-directional. Ambiguous temporal precedence is often a threat to internal validity in nonexperimental research. Therefore, even though the current study only examined the association in one direction, it is acknowledged that the associations could have been bidirectional when viewed theoretically and through previous research.

Understanding the bidirectional nature of the interaction, evidence suggests that anxiety and/or depression can influence the decision-making process (Hartley & Phelps, 2012; Harlé et al., 2017; Leykin et al., 2011). For instance, an anxious emerging adult may engage in hypervigilant decision-making, while conversely, situations demanding hypervigilant decision-making due to time constraints may exacerbate anxiety symptomology. This bidirectional relationship applies similarly to depression symptomology.

The bidirectional interaction between decision-making processes and mental health outcomes (anxiety and/or depression symptomology) extends beyond emerging adulthood, and it should be noted that the current study only examined the association in one direction. This bidirectionality is discussed to acknowledge that the associations could manifest differently from those examined in the study. Moreover, such bidirectional interactions may occur across the life course. Decision-making skills develop and evolve throughout various developmental stages, influenced by environmental factors that can either facilitate or impede adaptive decision-making. These dynamics are likely to be observed across different life stages (Tomlinson et al., 2021).

While the current study focused solely on the unidirectional approach to the relationship between decision-making and anxiety and depression, it is noteworthy that the buck-passing decision-making style did not emerge as a significant predictor for anxiety and depression symptomology. Buck-passing was the only maladaptive decision-making style that was not found to be a significant predictor for increased rates of anxiety and depression symptomology. It is possible that buck-passing, may enable the emerging adult to avoid adverse outcomes, such as anxiety and/or depression symptomology. The avoidance of both decision-making and the resulting mental health outcomes in this study suggests that there may be no interaction between these variables, as both were avoided in the bidirectional interaction examined. Various factors could contribute to this avoidance, including fear of responsibility, perfectionism, or an overwhelming number of choices. While these specific reasons for

avoidance were not investigated in this study, it is crucial for future research to explore this interaction and associated factors. Understanding why buck-passing was the only maladaptive decision-making style that was not a significant predictor for anxiety and depression symptomology warrants further investigation.

Implications for society, practice and research

The findings of the current study have important implications for society, practice, and research.

Society: Understanding the role of decision-making in anxiety and depression symptomology among emerging adults provides an opportunity for society to assist in addressing the unique challenges faced by emerging adults. These changes are related to access to education, employment opportunities, and community resources that can improve decision-making skills and reduce the risk of anxiety and depression.

Practice: The prevalence of emerging adults at risk for a clinical diagnosis of anxiety and/or depression becomes significant if left untreated. Mental health problems have the potential to escalate and affect functioning later in life. Addressing these high rates requires clinical practices and interventions. However, solutions should extend beyond merely enhancing mental health service availability. Recommendations may include (Bantjes et al., 2023; Bantjes et al., 2022):

- Implementing interventions to promote positive decision-making and mental health
- Enhancing awareness of mental health literacy and support
- Launching context-specific campaigns to reduce mental health stigma and promote adaptive decision-making
- Establishing peer-to-peer support for emerging adults in communities
- Developing digital interventions that are acceptable and accessible to emerging adults from various social backgrounds

In clinical settings, recommendations from the current study could include employing a cognitive behavioural therapy (CBT) approach for anxiety and depression, where clients could be introduced to both adaptive and maladaptive forms of decision-making. Following this introduction, clients could be prompted to reflect on which decision-making styles they typically employ and explore the factors influencing these choices. Once identified, psycho-education on the bidirectional relationship between behaviour and decision-making could equip clients with strategies to manage situations of heightened anxiety and depression symptomology.

Understanding the decision-making styles of emerging adults or clients during history-taking would also aid in gaining insight into the client's pre-morbid decision-making patterns, tracking any shifts or changes during therapy, and assessing the impact of treatment on decision-making behaviour.

Research: The role of decision-making styles in the anxiety and depression symptomology of emerging adults offers insights for developing new assessment tools to evaluate intervention effectiveness in enhancing decision-making skills and alleviating anxiety and depression symptomology. In addition, a gap still remains in understanding the role of decision-making styles in anxiety and depression symptomology across cultures and differences by gender, as well as moving away from general decision-making to exploring the impact across various life-specific domains such as education, career, and relationships.

Even though recommendations for policies and programmes are made, it is important to consider the acceptability, accessibility, appropriateness, and scalability of all policies and programmes related to decision-making, as well as anxiety and depression.

Limitations

The study was conducted during the COVID-19 pandemic, likely contributing to the elevated rates of anxiety and depression symptoms observed. Additionally, the sample comprised emerging adults enrolled in HEIs. Consequently, individuals not pursuing higher education might exhibit distinct outcomes regarding decision-making and anxiety or depression symptomology compared to those in the study. Another limitation is that data were collected solely in English, the medium of instruction in many South African HEIs, excluding other official languages. Additionally, the study relied on self-report measures and did not encompass all HEIs, potentially limiting its representativeness of the broader South African emerging adult population. While the study did not examine the role of historically marginalised groups in terms of ethnicity, gender-nonconformity, sexual minority, and poverty, further investigation into these factors could offer valuable insights. Understanding how these marginalised groups experience decision-making and mental health challenges could inform the development of more inclusive policies and programmes aimed at promoting mental well-being. Furthermore, the study used the HADS, and we acknowledge the challenges regarding its use as highlighted by Coyne and van Sonderen (2012). It is suggested that future studies make use of alternative measures of anxiety and depression that have improved consistency, scoring/responses, and factor structures.

Conclusion

The study investigated whether decision-making styles predict anxiety and depression symptomology among emerging adults in South Africa. Results indicate that the decision-making styles employed by this group predicted anxiety and depression symptomology. The interplay between decision-making and anxiety/depression is bidirectional, revealing that vigilant decision-making correlates with reduced symptoms, whereas maladaptive decision-making shows the opposite effect. These findings have significant implications for society, practice, and research, necessitating interventions that are acceptable, accessible, appropriate, and scalable.

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