Cognitive Vulnerability-Stress Model in predicting depressive symptoms amongst university students

by

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DECLARATION

I declare that the mini-dissertation hereby submitted to the University of Pretoria, for the degree of Masters in Clinical Psychology has not previously been submitted by me for a degree at this or any other university; that it is my work in design and in execution, and that all material contained herein has been duly acknowledged.

_____   _____

Initials & Surname   **Date**

DEDICATION

To my husband Ashley who inspires and encourages me; I love you dearly.

To my mum and dad, for their unwavering love and constant support.

ACKNOWLEDGEMENT

My eternal gratitude to Dr M.S Makhubela for his patience, astute guidance and encouragement. I feel privileged in having had the opportunity to work with Dr Makhubela and learn from his expertise.

ABSTRACT

With the global and local incidence rates of depression and suicide being rapidly on the rise, efforts in research to identify casual factors which increase an individual's vulnerability to depression have been widely undertaken. However, in South Africa there still remains a paucity of information in the area of cognitive-vulnerability or diathesis to depression. The present study investigated whether negative life events (i.e., stress) interact with negative cognitive style (i.e., hopelessness) to predict depressive symptoms in South African university students. Gender differences in the predictive associations between stress, hopelessness and depression were also included in the analyses. A survey was completed by 304 university students (mean age = 21.66 years; SD = 3.485). The research design is quantitative in nature and took the form of a cross-sectional study. Using path analysis (PA) the findings of this research study indicated that hopelessness moderates the relationship between stress and depression. It was also found that stress and hopelessness were more strongly associated with depression for male students than for female students. Recommendations for future studies and limitations pertaining to the present study are also discussed.

Key words: *depression, hopelessness, cognitive vulnerability, stress, negative life events, gender*

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CHAPTER 1

1. **General introduction**

1.1 **Introduction**

Depression is frequently referred to as the common cold of mental illness (Albers, 2012). This metaphor refers to the high prevalence of depression which is globally on the rise. The most common and devastating outcome of untreated depression is suicide, which according to the World Health Organisation (2012) *Global Burden of Disease* report, has a rate of three deaths per 100,000 people in South Africa that year (Lebohang, 2015). However, a 2009 nationally representative study by the Medical Research Council of South Africa, which used post-mortem reports, found that there were 6,471 suicides that year. This translates to 18 suicides every day and a suicide rate of 13.4 per 100,000 people (Lebohang, 2015).

The World Health Organisation estimates that by the year 2020, unipolar major depression will become the second cause of disability globally (Murray & Lopez, 1996). Statistics South Africa reported that 16% of the population in South Africa suffered from mood disorders in the 2001 census (Statistics South Africa, 2005). The lifetime incidence of depressive disorders in South Africa is reported to be around 10% of the population (Tomlinson, Grimsrud, Stein, Williams, & Myer, 2009). Although this prevalence is lower than that of most developed countries (e.g., USA), it still has a large impact on the burden of health in South Africa. Tomlinson et al. (2009) also report that females constitute a higher proportion of this incidence rate of depression than their male counterparts (1.75 times higher).

By the year 2030, major depression is predicted to be the main contributor to the burden of health worldwide (Freeman & Joska, 2013). Not only does depression contribute to the health burden of a country but also affects people on an individual level. Direct consequences include occupational and social dysfunction, increased risk of suicide and increased morbidity and mortality (Lépine & Briley, 2011). Considering the impact that depression has on the

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patient, it is imperative that healthcare practitioners and the community at large are aware of variables that can influence the development of depression. This will facilitate earlier diagnosis and optimum management of those affected.

The hopelessness theory of depression, a cognitive vulnerability-stress model, explains the aetiology and causal pathway of a subtype of depression—''hopelessness depression''—as a by-product of the operation of cognitive vulnerabilities (i.e., hopelessness) and the occurrence of negative life events (i.e., stress) (Abramson, Metalsky, & Alloy, 1989; Panzarella, Alloy, & Whitehouse, 2006). The theory regards the inclination to view causes of negative events as global and stable (hopelessness), and as one such cognitive style which is considered to be a strong predictor of depression. This cognitive style increases the probability for an individual to make depressogenic inferences and develop depressive symptoms following the occurrence of negative life events (Abela, 2001). Hopelessness is hypothesised as a proximal cause of the development of "hopelessness depression", a depression subtype that shares defining features of traditional depressive disorders but involves a specific subset of symptoms (see Alloy et al., 2000 for criteria). Stress is seen as a distal contributory cause of depression (Dixon, Heppner, Burnett, & Lips, 1993; Panzarella et al., 2006). Stress is one of the strongest predictors of depression among children and adolescents (Grant et al., 2006). It is anticipated that this cognitive vulnerability (hopelessness) interacts with stress resulting in a greater likelihood of the development of depression (Byrne & McCarthy, 2007).

1.2 Statement of the problem

Although depression is a widely used construct in South Africa, there is limited research relating to the aetiology of the disorder. Information detailing prevalence rates, features of depression and descriptions of the syndrome is readily available (Hamad, Fernald, Karlan & Zinman, 2008; Ngcobo & Pillay, 2008; Rochat, Tomlinson, Barnighausen, Newell & Stein, 2011; Tomlinson et al, 2009), however there is paucity of research detailing the most common

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causes of depression experienced by the South African population. This information is pertinent in advancing knowledge on the developmental pathways to depression within the South African context.

The South African Depression and Anxiety Group's 2015) (SADAG) recently published report investigating depression symptoms in the workplace revealed that there is poor awareness of cognitive symptoms among the 1000 employed and previously employed workers or managers who participated in the study. Seventy four percent of the participants in this SADAG study reported experiencing symptoms such as trouble concentrating, forgetfulness, and indecisiveness the last time they were depressed. The lack of knowledge regarding the development and aetiology of depression within the South African population impacts the ability to recognise depression symptoms on an individual level. Studies conducted abroad have supported the predictive relationship of stress and hopelessness on depression (Alford, Lester, Patel, Buchanan, & Giunta, 1995; Dixon, 1993; Grant et al., 2006; Joiner, 2001)

As such, investigating the relationship between negative life events (i.e., stress) and negative cognitive styles (i.e., hopelessness) as predictors of depressive symptoms with a South African sample, will contribute to the modest body of research on depression in South Africa.

1.3 Aim of the study

This study investigated whether stress interact with hopelessness to predict depressive symptoms in South African university students.

1.4 Objectives of the study

To answer the research question, the following objectives were developed:

1.4.1 To assess if hopelessness moderates the relationship between stress and depressive symptoms; and

1.4.2 To examine whether gender mediates the associations between stress, hopelessness and depression?

1.5 Research questions

This study was designed to answer the following research questions:

1.5.1 Does hopelessness mediate the relationship between stress and depressive symptoms in university students?

1.5.2 Will the associations between stress, hopelessness and depression vary as a function of gender?

1.6 Significance of the study

Despite the increasing prevalence rates of depression in South Africa (Lebohang, 2015; Statistics South Africa, 2001; Tomlinson et al., 2009), there is limited research pertaining to the aetiology and development of depression. This has affected the development of treatment and preventative interventions for depression. Thus, research aimed at assessing the validity of the leading theories of depression, such as the hopelessness theory is needed. By elucidating on relations between hopelessness, stress and depression, the researcher aims to advance a more nuanced understanding of the development and course of this common and debilitating disorder in university students.

Pillay, Edwards, Gambu and Dhlomo's (2002) study on depression amongst university students in South Africa reported mean scores as high as 19.1 on the Beck Depression Inventory among participants. Worldwide, young adults (19-24 years of age) are considered to be the most at-risk group for depression and suicidality (Bridge, Goldstein, & Brent, 2006). O'Connor and Sheehy (2001) state that hopelessness is the most frequently implicated construct related to suicidal behaviour. Within the South African context, SADAG found that two thirds of all suicide victims are aged between 20 and 39 (Malan, 2014). Given the alarmingly high rates of depression and suicide

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amongst the youth in South Africa (see Madu & Matla, 2003; Schlebusch, 2005; Schlebusch, 2011), identifying pre-existing cognitive vulnerabilities such as hopelessness may be targets for preventive and psychotherapeutic interventions in these student populations. Research also suggests that by early adolescence, explicit cognitive vulnerabilities, such as negative cognitive style are relatively stable or trait-like (Cole et al., 2008).

The American Psychiatric Association in their report on the *Summit on Women and Depression*, identified the need for further research focusing on the effects of gender on the aetiology, diagnosis, treatment and prevention of depression (Mazure, Keita, & Blehar, 2002). In order to improve understanding of the dynamics around the development of depression, a gender specific objective has also been included within this research study. The current study focussed on young adults, following Hankin et al.'s (1998) suggestion that gender differences in depression emerge in late adolescence. Abela (2001) and Abela and McGirr (2007) reported that females exhibiting cognitive vulnerability (hopelessness) are more likely to develop depression following negative life events than males. In contrast, studies such as that by Hankin, Abramson, and Siler (2001) conclude that it is more probable for males to develop depressive symptoms following negative life events than females. It is hoped that findings from the proposed study will clarify and also contribute to the modest body of literature regarding the mediation role of gender on the effects of cognitive vulnerability-stress on depression. While there is considerable research linking stress, hopelessness and depression elsewhere, this association is yet to be established in an African context.

1.7 Operational definition of terms

1.7.1 Depressive mood:

Depressive mood in the context of this study is defined as a psychological state which is characterised by persistent feelings of sadness, tearfulness, hopelessness, anxiousness, rumination, anhedonia, loss of appetite or

overeating, insomnia or oversleeping, somatic complains and suicidal ideation (American Psychiatric Association, 2013; Beck, 1967).

1.7.2 Cognitive vulnerability:

According to Beck (1987) dysfunctional attitudes are vulnerability factors which contribute to the development of depression. Within the cognitive theory framework, cognitive vulnerability is usually regarded as an enduring trait-like or pattern of thought which predisposes an individual to a disorder (Ingram, Miranda & Segal, 1998, for reviews). This concept is used similarly in the current study. The terms negative cognitive style and cognitive vulnerability are used interchangeably in this dissertation to refer to hopelessness.

1.7.3 Hopelessness:

The hopelessness theory of depression refers to hopelessness as the inclination to view causes of negative events as global and stable. Hopelessness is defined as "an expectation that highly desired outcomes are unlikely to occur or that highly aversive outcomes are likely to occur and that no response in one's repertoire will change the likelihood of these outcomes" (Abramson, Alloy, & Metalsky, 1988, p.7).

1.7.4 Negative life events:

Negative life events are often sudden experiences which could potentially significantly alter one's social world (e.g., death of a spouse, unemployment; Wheaton, 1994). The terms negative life events, negative events and stressful life events are used interchangeably in this dissertation to represent stress. An exposition of these concepts follows in the literature review section.

1.7.5 Stressful life events

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Stressful life events refer to stressful stimuli or situations to which people are exposed to in varying intensities throughout the natural course of life (Dohrenwend & Dohrenwend, 1974).

1.7.6 Stress:

Stress is defined in this study as how unpredictable, uncontrollable and overloading respondents find their lives. It can also be seen as the degree to which situations and circumstances in one's life are appraised as stressful (Lee, 2012).

1.8 **Conclusion**

The chapter outlined the research questions, aim and objectives of the study and further introduced and defined relevant terms of the study.

CHAPTER 2

2.   **Introduction**

This chapter outlines the theoretical perspective and literature review of the study.

2.1   **Theoretical perspective**

While there are many theories which offer explanations on the development of depression, the present study is premised within the cognitive theories of depression. These theories have received much empirical and theoretical support (Abramson et al., 2002; Ingram et al., 1998, for reviews), providing attention to the role of cognition in the developmental aetiology and maintenance of depression. Cognitive vulnerability-stress models of depression also account for the course and intervention for the disorder.

Cognitive vulnerability-stress models of depression posit that the meaning one makes about one's experiences strongly influences one's vulnerability to depression (Abramson, Alloy, Hankin, Haeffel, MacCoon, & Gibb, 2002). Beck's hopelessness theory of depression proposes a cognitive vulnerability-stress model for understanding the development of depression (Hankin & Abramson, 2001). According to hopelessness theory negative inferences about cause (the tendency to attribute negative events to stable and global causes), self (the likelihood of finding negative self-meaning and implications for one's self following the occurrence of negative events) and future consequences (the propensity to catastrophize the consequences of negative events) is termed 'negative cognitive style' (Panzarella et al., 2006). A negative cognitive style in interaction with negative life events has been demonstrated to predict depression (Hankin & Abramson, 2002). Stress (i.e., how unpredictable, uncontrollable and overloading respondents find their

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lives) is an indicator of negative life events, which can be seen as the degree to which situations and circumstances in one's life are appraised as stressful (Lee, 2012).

Hopelessness is defined as an expectation that aversive outcomes are more likely to occur than desired ones, regardless of the individual's response. (Abramson et al., 1988). Hopelessness theory views hopelessness as a critical variable which mediates the relationship between stress and depressive mood or interacts with stress to predict depression (Hankin, Lakdawalla, Carter, Abela, & Adams, 2007). It is hypothesised that in the presence of stress, persons who possess a negative inferential style are likely to experience more depression than persons without (Dixon et al., 1993). Thus, hopelessness can be regarded as a variable which may mediate or moderate the depressive effects of stress as suggested by Beck's cognitive theory (Hammen, 2009). While this theoretical model postulate interaction effects between the said explanatory variables of depression, this interaction between stress and hopelessness has mostly been hypothesized but rarely tested. As such the current study empirically tested the hopelessness theory, a Cognitive vulnerability-stress model of depression (Abramson et al., 1989; Panzarella et al., 2006) by exploring the relationship between stress, hopelessness and depressive symptoms in university students.

2.2   Literature review

Relationship between stress, hopelessness and depressive symptoms

Cognitive vulnerabilities are pivotal in the development and maintenance of depression in adulthood, childhood and adolescence (Jacobs, Reinecke, Gollan, & Kane, 2008). Attention has been increasingly drawn to the function of cognitive vulnerabilities as predictive factors for the development of several disorders over the past few years (Elwood, Hahn, Olatunji & Williams, 2009).The current study explores whether the tendency towards hopelessness in combination with stress gives way to the development of depressive symptoms. Ingram (2003) asserts that research around the

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construct of cognitive vulnerability (e.g., hopelessness) is becoming the main focus in efforts to understand depression. This is the core focus of the current study, which seeks to identify the influence of hopelessness and stress on depression.

While international etiological research has identified stressful life events and cognitive vulnerabilities as important factors in the development of depression in adolescents (Cardemil, Reivich, Beevers, Seligman & James, 2007; Cicchetti & Toth, 1998; Deardorff, Gonzalez & Sandler, 2003), there are however no studies South Africa thus far that have investigated these variables in a population of young adults, specifically university students. Research, from elsewhere, has generally supported Beck's and Abramson's assertion that hopelessness in combination with stressful life events plays a significant role in contributing to depressive symptoms (e.g., Ahlfeldt, 2006; Alford, Lester, Patel, Buchanan, & Giunta, 1995; Joiner, 2001). However, a study by Alford et al. (1995) revealed that hopelessness was found to predict depression over and above negative life event stressors, but not vice versa.

Using the hopelessness theory of depression, the *Temple-Wisconsin Cognitive Vulnerability to Depression Project* conducted at Temple University and the University of Wisconsin, found that participants who exhibited a negative cognitive style, were consistently found to have an elevated likelihood of developing depressive disorders (Alloy et al., 2000). Consistent with these findings and lending support to this hopelessness theory of depression, Joiner (2001) also reported significant associations between negative attributional style and hopelessness depression symptoms with his participants. Similarly, Joiner, Wingate, and Otamendi (2005) found that hopelessness is crucial to the stress generation process, as it mediates the relation between depressive symptoms and stress. Dixon (1993) found high correlations between hopelessness and depression in the presence of elevated stress levels. A multiplicative relation was found between all three variables. Ahlfeldt (2006) also reported high correlations between hopelessness and depressive symptoms with a clinical South African sample.

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Prior research has also found that stressful life events predict increases in depressive symptoms, syndromes, and disorders in adolescents (e.g., Hankin & Abramson, 2002; Sanchez, Lambert & Cooley-Strickland, 2013). In fact, stress has been shown to be a stronger predictor of depressive syndromes and disorders than depressed mood (Compas, Grant & Ey, 1995). Adolescents who experienced one negative life event were reported to be at a fivefold increased risk of developing stable Major Depressive Disorder compared to controls, while those who experienced multiple negative events had an eightfold increase in risk of developing stable depressive disorder (Patton, Coffey & Posterino, 2003). Available research with low-income and African-American youth supports the link between adverse life events and depression (e.g., Deardorff et al., 2003; Hammack, Robinson & Crawford, 2004). There is also evidence that stress related economic, family, peer, discrimination, violence, and school domains, is positively associated with depressive symptoms in ethnically diverse urban youth in cross-sectional and longitudinal studies (Natsuaki et al., 2007).

Gender differences in the associations between stress, cognitive style, and depression

While gender differences in depression have long been well documented (see Hankin & Abrahamson, 2001), researchers only have a limited understanding of the processes by which the gender differences emerge. Elaborating upon the cognitive vulnerability-stress model of depression, several researchers have attempted to apply this model to understanding the emergent gender difference in depression (e.g., Hankin & Abramson, 2001; Hyde, Mezulis, & Abramson, 2008; Mezulis, Funasaki, Charbonneau, & Hyde, 2009). For instance, Gladstone, Kaslow, Seeley and Lewinsohn (1997) reported that negative cognitive style was more strongly linked to depression for high school girls than boys. Rudolph and Hammen (1999) found that the correlation between negative events and depression was higher for girls than boys; and Silberg et al. (1999) similarly found that negative events prospectively predicted clinical depression more strongly in pubertal girls than

in boys. This is said to be explained by female adolescents' greater cognitive vulnerability to depression (Hankin & Abramson, 2001).

Bouma, Ormel, Verhulst and Oldehinkel (2008) recently also found that girls were more likely to develop depressive symptoms in response to stress than were boys. In particular, the relationship between interpersonal stress and depression may be stronger for girls than boys (Liu & Kaplan, 1999; Rudolph & Hammen, 1999). The cognitive vulnerability-stress interaction may be more strongly implicated in the generation of depressive symptoms among girls than boys (see Nolen-Hoeksema, 1990). Prinstein and Aikins (2004) also found that negative attributional style, in interaction specifically with peer stress, predicted increases in depressive symptoms for girls but not for boys. Similarly, Mezulis et al. (2009) observed a stronger correlation between stressful life events and depression for girls than for boys, and that the cognitive vulnerability-stress interaction was significant in predicting girls' but not boys' depressive symptoms.

Globally, the ratio of depression in women to men is 2:1 (Ngcobo & Pillay, 2008). Consistent with these findings, Tomlinson et al. (2009) reported the prevalence of depression in South Africa to be 1.75 greater in females in comparison to males. Interestingly, it is reported that nearly five times more males commit suicide in South Africa than females (Schlebusch, 2005). Given the established findings on gender differences in depression in South Africa, it will be interesting to see if the cognitive vulnerability-stress model can provide us with a nuanced understanding of the processes by which the gender differences emerge and this aspect is not well established in the literature.

2.3   **Conclusion**

This section discussed the theoretical perspective of the study which is premised in cognitive theory. Findings from studies comparing hopelessness, stress and depression were explored, and the impact of gender on their association was discussed.

CHAPTER 3

METHODOLOGY

3.   **Introduction**

This chapter outlines the methods used in this study. This includes explanations of the data collection instruments and procedures followed in conducting the research.

3.1   **Research design**

The methodology employed in this study follows that of quantitative research with a cross-sectional survey design. This is premised on an empiricist approach to research, whereby, the goal of quantitative methods is to determine whether the predictive generalizations of a theory hold true by acquiring knowledge through observation. It is characterized by philosophical determinism, where human behaviour is viewed as the lawful outcome of antecedent environmental events (Reber, 1995). These predictions are made on the basis of the previously observed and explained realities and their interrelationships.

3.2   **Participants**

A purposive sample of 304 was drawn for this study from both the University of Limpopo and University of Pretoria, in South Africa. Eighty five (28.1%) questionnaires were collected from the University of Limpopo, while two hundred and eighteen (71.9%) came from the University of Pretoria. Participants were undergraduate students, aged 18 to 50 years, with a mean

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age of 21.66 years (SD = 3.485). Of all the participants 145 (47.9%) selected the classification of 'Black', 139 (45.9%) were 'White', 9 (3.0%) were 'Asian' and 9 (3.0%) were 'Coloured'. Sixty seven (22.1%) participants were male, while 236 (77.6%) were female. Gender enrolment statistics at both universities indicated a substantially higher number of female students as opposed to male students. During the year 2011, University of Pretoria had an estimated number of 24 542 female students and 20 203 male students (Department of higher education and training, 2013). This could account for the higher female sample in the present study.

The following were the inclusion criteria: 1) undergraduate university students, 2) command of English, 3) predominantly White university and predominantly Black university 4) Age (≥18 year olds). Sampling from these institutions ensured that a heterogeneous sample (i.e., race and socio-economic status) which also approximated the ones used in previous studies on depression was achieved. As young adults are considered to be the most at-risk group for depression and suicidality worldwide (Bridge et al., 2006), university students were selected with the hope to heighten the understanding around the development of depression within this vulnerable population. It is also suggested by Hankin et al. (1998) that gender differences in depression emerge in late adolescence and this is the age group of most university students.

3.3   Research instruments

The data was collected with the following questionnaires a demographic questionnaire, the Perceived Stress Scale (PSS-10), the Beck Hopelessness Scale (BHS) and the Hopkins Symptom Checklist (HSCL-15 [depression subscale]).

3.3.1   *Demographic questionnaire*

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In the demographic information, participants were asked to provide information on their background and current family situation. All the respondents indicated their age, gender; ethnic identification, and SES.

3.3.2 *PSS-10*

The PSS-10 (Cohen & Williamson, 1988) measures the degree to which individuals perceive their daily life during the past month as uncontrollable, unpredictable, and overloading. Each item is rated on a 5-point Likert scale ranging from never (0) to almost always (4). Positively worded items (items 4, 5, 7, & 8) are reverse scored (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) and then summed across all scale items. Higher scores on the PSS-10 represent higher levels of perceived stress. The PSS-10 has a single factor structure, good test-retest reliability ($r > .70$) and adequate internal consistency ($α = .72$ to .89) (Hamad et al., 2008; Lee, 2012). The Cronbach alpha coefficient for the scale was .50 in the current study.

3.3.3 *BHS*

The BHS consists of 20 true-false statements designed to assess the individual's beliefs about the future. Example items on the BHS include: "*I have enough time to accomplish the things I want to do*" and "*I look forward to the future with hope and enthusiasm.*" Possible total scores can range from 0-20 from the 9 keyed false items and 11 keyed true items. Higher scores suggest higher levels of hopelessness. This measure has a satisfactory internal consistency with a Cronbach's alpha around .93 in South Africa (Boyle, Saklofske, & Matthews, 2004; Steele & Edwards, 2008). The internal reliability coefficient of the scale was adequate at .67 in the present study.

3.3.4 *HSCL-15 (depression)*

The Hopkins Symptom Checklist (HSCL-25) is a shorter version of the 90-item Symptom Checklist. This scale is designed to assess anxiety and depressive symptoms. It includes a 10-item anxiety subscale and a 15-item

depression subscale. The HSCL-15 depression self-rating subscale was used to examine the participants' levels of depression. The measure is scored on a severity scale from '1' (not at all) to '4' (extremely) (Nettelbladt, Hansson, Stefansson, Borgquist, & Nordström, 1993). Respondents with depression scores higher than a mean of 1.75 are classified as having a clinical depression. The measure has high internal consistency coefficients ranging from .84 to .90 in South Africa (Halvorsen & Kagee, 2010; Reme, Lie, & Eriksen, 2014). The measure displayed an internal reliability coefficient of .88 in the current study.

3.4   Procedure

This study is a secondary analysis of part of a longitudinal data previously collected in 2013 as part of a larger research project on depression in South Africa. Students were recruited from undergraduate classes at both the University of Limpopo and the University of Pretoria. The purpose of the research was first explained and then instructions on completing the questionnaire were given. For instance, they were made aware of the voluntary nature of their participation and the right to withdraw at any stage of the study without any consequences. Once students consented in writing to participating in the study, the questionnaire was administered to them in group setting. The survey was completed in English. Participants were not compensated for taking part in the research and they were debriefed at the end of data collection sessions.

3.5   Ethical Considerations

The study was approved by the research and ethics committees of both the University of Limpopo and University of Pretoria, respectively. All participants consented to participation in the study. Participation was voluntary, while confidentiality was assured. The raw data was securely stored for archiving and reuse for further research and/or data analysis. Participants consented that the data can be used for further studies by other researchers in the future.

3.6   **Conclusion**

This section provided a comprehensive description of the research design used as well as the procedures followed and participants used in the study.

CHAPTER 4
RESULTS

4.   **Introduction**

This chapter describes the data analysis processes, methods, results and interpretation of the data for the study.

4.1   **Data analysis strategy**

Data analysis for this study was conducted using both the SPSS 22.0 (IBM Corp., 2014) and AMOS 22.0 for windows program (Arbuckle, 2013). Preliminary analysis was conducted to determine among others the sample and data characteristics (e.g., mean, standard deviation, frequencies and percentages, internal consistencies of the instruments and the association between the measured variables). Following this, SEM path analysis (PA) using maximum likelihood (ML) estimation was applied to examine the cross-sectional associations between predictor and outcome variables. To identify the most significant and meaningful model modifications, the modification indices (MI) were examined and paths that are most likely to improve the fit of the model and which make theoretical sense were added. The hypothesised measurement model fit was assessed by means of several goodness-of-fit

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indices (i.e., absolute, incremental and parsimonious fit), associated expected parameter changes and residual error terms (Hu & Bentler, 1998, 1999).

The goodness-of-fit indices included the Chi-square statistic to *df* ratio (χ^2/df), the root mean square error of approximation (RMSEA) along with its related 90% CI, the comparative Fit Index (CFI), Tucker-Lewis Index (TLI) and the normed fit index (NFI). The model was accepted as providing good fit if $\chi^2/df <$ 1.5, TLI and CFI ≥ 0.95, NFI > 0.90, RMSEA ≤ 0.06 (see Bentler, 1990; Bentler & Bonett, 1980; Hu & Bentler, 1999; Kline, 2005). Direct, indirect and interaction effects as an indication of the effects of the predictor variables on the outcome variable were presented by the significance of standardised regression coefficients (β), probability values and their 95% confidence intervals (Baron & Kenny, 1986).

4.2 Presentation of results

4.2.1 *Descriptive data*

Scores on the HSCL-15 (depression) ranged from 15 to 50, the grand mean was 25.81 (SD = 6.52), while the median was 25.00 and the mode was 23. The BHS (hopelessness) scores ranged from 1 to 20, with the grand mean of 4.35 (SD = 2.45), the median was 4.00 and the mode was 3. While scores on the PSS (stress) ranged from 0 to 35, with a grand mean of 21.09 (SD = 5.27), the median was 22.00 and the mode was 23. Normality of the data was investigated with the Mardia's (1970) multivariate kurtosis coefficient. As expected, the full sample Mardia's multivariate kurtosis coefficient was 35.61 (c.r. = 54.76) (item level skewness > 1.5 and item level kurtosis > 2), evidently signifying that the assumptions of multivariate normality were violated. Thus, the use of Bootstrap estimation procedure was justified.

The moderating effects of hopelessness on stress and depression were also tested for significance using the Bootstrap estimation method in AMOS (i.e., sample specified at 1000). The use of Sobel test was not possible, in that, it

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requires the products of direct effects to follow a normal distribution. Thus, in our case, its use would have resulted in the reduction of statistical efficacy. According to MacKinnon, Lockwood, Hoffman, West and Sheets (2002) the bootstrap test yields the most accurate confidence intervals for indirect effects.

4.2.2 *Relationship between stress, hopelessness and depression*

The correlation matrix of the variables of the model was also constructed to determine whether the three variables, namely hopelessness, stress and depression are related significantly to each other. Table 1 presents the correlations among them. The majority of correlations were significant ($p <$ .01).

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**Table 1: Intercorrelations among stress, hopelessness and depression**

	Stress	Hopelessness	Depression
Stress	1		
Hopelessness	0.66	1	
Depression	0.40**	0.49**	1

**$p < .01$

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4.2.3 *Moderated model: cognitive vulnerability-stress model*

The model hypothesized that hopelessness interacts with stress to predict depressive symptoms (see figure 1). As indicated in Table 2, the hypothesized model revealed an excellent fit to the data ($X^2_{[1]}$ = 1.96, p = 0.16; NFI = 0.99; CFI = 0.99; RMSEA = 0.05, 90% CI = 0.00 - 0.14). The interaction effect/product variable (i.e., stress*hopelessness) had significant positive effect on depression (β = .595, p < 0.01, z = 3.021), providing evidence of a significant interaction effect between hopelessness and stress as expected and predicted by the theory. However, the direct effects of stress and hopelessness on depression were not statistically significant (βs = .089 & - 0.155, p > 0.05, zs = 1.059 & -.850 respectively). The effects of stress and hopelessness on depression before the interaction variable was introduced to the model, were significant (βs = .310 & .383, p < 0.01, zs = 7.587 & 9.379), although the effect sizes were small compared to that of the interaction variable.

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Figure 1:
Hypothesised mediated cognitive vulnerability-stress model
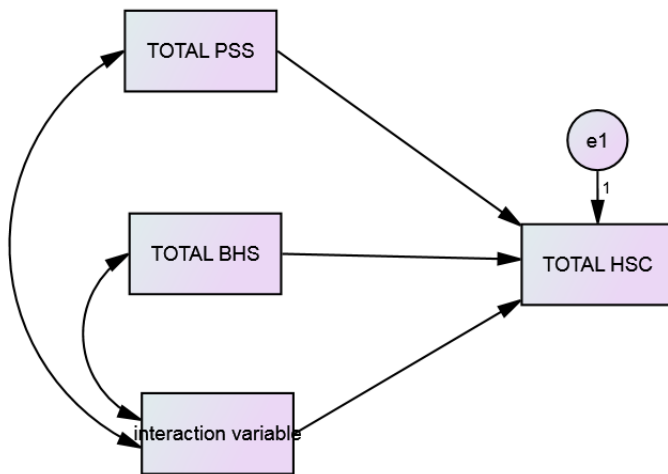
Table 2:

Moderation path model: Goodness-of-fit statistics

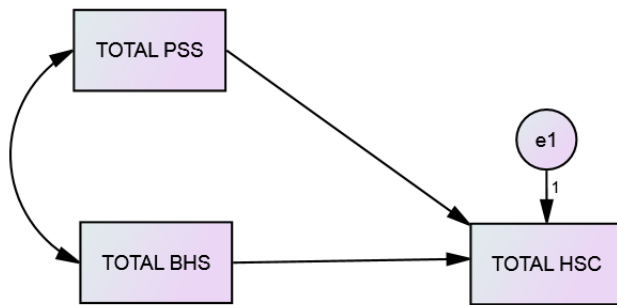|	df	χ^2	TLI	CFI	NFI	RMSEA	90%RMSEA CI
Model	1	1.96	0.99	0.99	0.99	0.05	0.00, 0.14

Note. df = degrees of freedom; χ^2 = Chi-square test; CFI = Comparative Fit Index; NFI = Non-normed Fit Index; RMSEA = root mean square error of approximation and its 90% confidence interval.

4.2.4 Gender difference *in the relationship between stress, hopelessness and depression*

Gender differences in the association between stress, hopelessness and depressive symptoms were tested (see figure 2). As seen in Table 3, the resulting models had an excellent fit to the data. Stress significantly predicted depression more for male (β = .313, $p < 0.01$, z = 4.401) than for female (β = .298, $p < 0.01$, z = 5.969) participants. Similarly, hopelessness was more strongly linked to depression for male students (β = .442, $p < 0.01$, z = 6.212) than for female students (β = .366, $p < 0.01$, z = 7.335).

Figure 2:
Hypothesised gender mediated cognitive vulnerability-stress model

Table 3:

Gender mediated path models: Goodness-of-fit statistics

	df	χ^2	TLI	CFI	NFI	RMSEA	90% RMSEA CI
Male model	1	0.18	0.99	0.99	0.99	0.00	0.00, 0.17
Female model	1	3.90	0.90	0.97	0.95	0.09	0.00, 0.20

Note. df = degrees of freedom; χ^2 = Chi-square test; CFI = Comparative Fit Index; NFI = Non-normed Fit Index; RMSEA = root mean square error of approximation and its 90% confidence interval.

CHAPTER 5
DISCUSSION

5. **Introduction**

This section discusses the results of the present study and compares them with previous findings of past research. The chapter also includes recommendations and limitations of the current study.

5.1 *Moderator effects of hopelessness on the relationship between stress and depression*

Path analysis indicated that hopelessness moderates the relationship between stress and depression. That is hopelessness moderated the association between stress and depressive mood. This result suggests that the effect of stress on depression levels vary depending on the levels of hopelessness. As can be evidenced in our results, adding the moderation effect led to a significant improvement in how well the regression performed. The moderation variable explained a significant variance in depression scores alone than stress and hopelessness in our model. Therefore, an individual's level of depressive response to stress depends on their level of hopelessness in the face of such events (Dixon, 1993; Joiner, 2001; Joiner et al., 2005).

5.2 *Gender differences in the predictive associations between stress, cognitive style, and depression*

The second objective was concerned with whether the relationship between stress, hopelessness and depressive mood could vary as a function of or across gender. Males exhibiting cognitive vulnerability (hopelessness) were found to be more likely to develop depression following stressful life events than their female counterparts. This result is consistent with studies such as that of Hankin, Abramson and Siler (2001) that concluded that it is more

probable for males to develop depressive symptoms following negative life events/stress than for females.

It could be stated that males are at a greater risk of developing depression due to differing help-seeking behaviours in comparison to females. Komiya, Good and Sherrod (2000) reported that males are less likely to seek counselling for their psychological problems. The common reasons identified for this were negative stigmas, fears around being perceived as weak and a commitment to uphold cultural masculine norms of being strong and independent (Lindinger-Sternart, 2015). However, women are considered to be the more emotionally expressive gender (Kring & Gordon 1998), and are hence able to acquire support from relatives, friends or psychological services.

Although the prevalence of depression in South Africa is significantly greater in females than males (Tomlinson et al., 2009), nearly five times more males commit suicide than females (Schlebusch, 2005). These findings could possibility be related to the poor help-seeking behaviours employed by South African males. It could also be hypothesised that males may be particularly vulnerable to the development of depression because of the demands of societal roles or expectations. As previously mentioned, traditionally men assumed the roles of 'provider' or 'breadwinner'. With the advances in gender equality and globalisation of gender roles, securing employment may be more challenging for men due to the increase of the female workforce.

However, these results are in contradiction with Abela's (2001) and Abela and McGirr's (2007) studies that reported that females exhibiting cognitive vulnerability (hopelessness) are more likely to develop depression following negative life events than males. Furthermore, there is a series of studies that report that the relationship between negative events/stress and depression may be stronger for girls than boys (Bouma, et al., 2008; Gladstone et al., 1997; Liu & Kaplan, 1999; Mezulis et al., 2009; Nolen-Hoeksema, 1990; Prinstein & Aikins, 2004; Rudolph & Hammen, 1999; Silberg et al., 1999).

Nolen-Hoeksema (2001) suggests that women's lack of social standing and greater reactivity to stressors may interact to create a greater vulnerability to depression. In the South African context, women have been found to face problems such as domestic violence, sexual abuse and inadequate support systems (Ngcobo & Pillay, 2008). These psychosocial stressors possibly contribute to women's lack of social power, thus creating a greater vulnerability to depression.

5.3   Recommendations

Future studies should examine whether hopelessness mediate the association between stress and depressive mood, as the theory also hypothesises a mediated relationship between the variables. It should be noted that the present study only examined one form of cognitive vulnerability's (i.e., hopelessness) moderation of the association between stress and depression. It is hoped that future research would examine other aspects of cognitive vulnerability (e.g. self-efficacy, low self-esteem, and rumination) as potential predictors of depression. Identification of pre-existing cognitive vulnerabilities is important as they may be targets of preventive or psychotherapeutic interventions.

5.4   Limitations

Firstly, the current study is limited by its reliance upon self-reported measures. It is possible that the participant's reports of negative life events and/or hopelessness were subject to recall or response biases based on participants current depressive symptoms. Also, most participants identified themselves as 'Black' or 'White'; oversampling among Asian and Coloured ethnic groups would allow for a more racially diverse sample. Thirdly, this study utilized university students; therefore these results are not generalizable to other populations.

5.5 Conclusion

This chapter discussed and contextualized the results. Recommendations for future studies and limitations of the current study were also provided.

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Appendix

Note: The researcher does not possess the rights to publish the psychological scales used in this study. As such, the scales are not appended.

Appendix A: Ethical clearance from the Universities of Pretoria

Faculty of Humanities
Research Ethics Committee

27 November 2015

Dear Prof Maree

Project: **Evaluation of the Cognitive-Vulnerability Stress Model in**
               predicting depressive symptoms amongst university
               students
Researcher: **C Maistry**
Supervisor: **Dr M Makhubela**
Department: **Psychology**
Reference number: 12252272 (GW20151117HS)

Thank you for the application that was submitted for ethical consideration.

I am pleased to inform you that the above application was **approved** by the
Research Ethics Committee on 26 November 2015. Data collection may therefore
commence.

Please note that this approval is based on the assumption that the research
will be carried out along the lines laid out in the proposal. Should the actual
research depart significantly from the proposed research, it will be necessary
to apply for a new research approval and ethical clearance.

The Committee requests you to convey this approval to the researcher. We
wish you success with this project.

Sincerely

Prof Karen Harris

Acting Chair: Research Ethics Committee

Faculty of Humanities

UNIVERSITY OF PRETORIA

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