

Which Stressors are Associated with Which Forms of Depression in a Homogenous Sample? An Analysis of the Effects of Lifestyle Changes and Demands on Five Subtypes of Depression

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Abstract

Background: Although depression is often considered as a single or unitary construct, evidence indicates the existence of several major subtypes of depression, some of which have distinct neurobiological bases and treatment options.

Objective: To explore the incidence of five subtypes of depression, and to identify which lifestyle changes and stressor demands are associated with each of five established subtypes of depression, within a homogenous non-clinical sample.

Method: 398 Australian university students completed the Effects of University Study on Lifestyle Questionnaire to identify their major stressors, plus the Zung Self-Rating Depression Scale to measure their symptomatology. Regression analysis was used to identify which stressors were most powerful predictors of each depression subtype.

Results: The five different subtypes of depression were predicted by a range of different stressors. Incidence of clinically significant scores for the subtypes of depression varied, with some participants experiencing more than one subtype of depression.

Conclusions: Different depression subtypes were predicted by different stressors, potentially challenging the clinical validity of depression as a unitary construct. Although restricted in their generalisability to clinical patient samples, these findings suggest further targets for research with depressed patients (*German J Psychiatry* 2012; 15(1): 23-31).

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Introduction

Depression is the major contributor to the total disease burden (Ustun et al., 2004) and predicted to become the second leading cause of mental illness by 2020 (Murray and Lopez, 1997; WHO, 2001). In addition to posing as great a risk for mortality as does smoking (even when related health factors such as blood pressure, alcohol intake, cholesterol and social status are taken into account (Mykletun et al., 2009), clinical and subsyndromal depression adversely affect physical health, relationships and cognitive performance (Lyness et al., 2006; Nutt, 2004), and, when combined with stress, may result in a shortened lifetime for the depressed individual (Wikgren et al., 2012). Because

stress is a major predictor of depression (Mirescu and Gould, 2006), and also linked with depression via dysregulation of the Hypothalamic-Pituitary-Adrenal (HPA) axis (Sharpley, 2010), the investigation of which demands or stressors are most strongly associated depression remains a key issue in applied clinical research. Although generalisation to the wider population of depressed persons is a final goal, for logistic and ethical reasons research into which types of stressors are most closely associated with depression may benefit from restriction to non-clinical samples as a first stage of exploration.

One particular population which has a high incidence of depression, and which may be conceptualised as passing through an identified period of adjustment stress, is university students (Keller et al., 2007; Keller and Nesse, 2005).

Although not an identified clinical population, some data suggest that 16% of university students suffer from major depression, 45% experience minor depression (Alloy et al., 2006), and that 28% of first-year students are overwhelmed by the challenges they encounter at university (Kitzrow, 2003). Other data have reported that 20% of some student samples experienced suicidal ideation but only 27% of those students received treatment for their distress (Tjia et al., 2005). In addition to exhibiting higher levels of depression than the general community (McLennan, 1992), university students who are depressed also have poorer grades (Dyrbye et al., 2006), perhaps in turn contributing to pessimism and psychological distress. Clearly, the investigation of the kinds of stressors which contribute to depression in university students can provide a vehicle for initial exploratory examination of the ways in which specific stressors are associated with depression in a more general sense.

However, although there are well-established pharmacological treatments for depression (Hollon et al., 2002), and several evidence-based psychotherapies for it (Cuijpers et al., 2008a), these are often based upon the assumption that depression is a *unitary construct*. That position has been challenged by evidence that depression may vary in terms of its underlying biology, with different neuroendocrinal pathophysiology and treatment options for Major Depressive Episode (MDE) compared to ‘atypical depression’ (Murck, 2003). Depression may also vary in terms of the number of symptoms present, as in the constructs of ‘subsyndromal depression’ (Judd et al., 1994) or ‘minor depression’ (Rapaport et al., 2002), which can approximate the disease burden of MDE despite patients showing only a subset of the symptoms of that disorder (Judd et al., 1996). The DSM-IV-TR describes different diagnostic criteria profiles for depression, such as melancholic depression, physiological reactivity depression, and depression with catatonic features (APA, 2000). Several previous studies (e.g., Kessing, 2007; Leckman et al., 1984; Singh and Williams, 2006; Yang and Dunner, 2001) have investigated these and other subtypes of depression in non-student samples, indicating that the notion of a single unitary construct of depression is unlikely to cover all presenting symptomatology, nor lead to accurate symptom-treatment matching.

That is, in addition to having different groups of symptoms, different subtypes of depression also have different treatment recommendations. For example, melancholic depression is widely considered to be relatively resistant to psychotherapy, and the suggested treatments are ECT and medication (Feinberg, 1992). Additionally, whichever of the two major alternative DSM-IV-TR criteria for MDE (i.e., depressed mood *vs* anhedonia) is present may also be an important factor in deciding on treatment models because anhedonic patients are unlikely to engage in the therapist-patient ‘therapeutic alliance’ (shown to be a major predictor of treatment outcome (Krupnick et al., 1996; Martin et al., 2000)), or to undertake the kinds of cognitive-behavioural ‘homework’ activities that are a vital aspect of therapies focussed upon changes in the depressed person’s lifestyle outside of therapy (Jacobson et al., 1996) and which may be used with patients who exhibit depressed mood without anhedonia (Pelle et al., 2010). Depression where somatic symptoms are dominant also needs different treatment mod-

els and emphases than depression which is predominantly composed of emotional or cognitive symptoms (Beck et al., 1979; Chan and Tsoi, 1984; Silverstein, 2002).

In summary, it may be that more effective treatment choices emerge from an understanding of the incidence of subtypes of depression that patients present, and of the relationships between the specific stressors that they encounter and the subtypes of depression they experience. Therefore, this study was designed to investigate the incidence of, and relationships between, five subtypes of depression (described below), plus identify those specific stressors (lifestyle changes and workplace demands) which were most strongly associated with the subtypes of depression. In order to control for the presence of potential confounds due to different stressors being present in different samples (e.g., age, occupation, health status), the sample was restricted to university students recruited from a single university in Queensland, Australia. Although this restriction to non-clinical participants limits the generalisability of data collected from such a study to clinical patients, the ‘proof of concept’ stage of this investigation requires that the linkages between stressors and subtypes of depression be demonstrated within a research paradigm which controls for as many sources of confound as possible, as well as limiting the potential for adverse reactions which might occur in clinical samples.

Materials and Methods

Subjects

Three hundred and ninety-eight university students (191 females, 207 males) from a university in Queensland, Australia volunteered to participate in the study. Their mean age was 22.6 years (SD = 6.3 years). Participants represented all faculties of the university (Humanities/Social Sciences, Law, Health & Medicine, Business, Sustainable Development and IT).

Instruments

Depression: The Zung Self-Rating Depression Scale (SDS) (Zung, 1965) is a standardised paper and pencil test of depression that has previously been used in studies of depression in university students (Bitsika et al., 2010c; Bitsika et al., 2010d). Having been developed on the basis of factor analytic studies of the syndrome of depression which underlie the DSM definition of Major Depressive Episode (MDE) (APA, 2000), the SDS includes items for all of the current DSM-IV-TR criteria for that disorder. Respondents are asked to indicate the frequency “during the last two weeks” of each of the depressive symptoms contained in the 20 items of the SDS by answering in one of four possible ways: “None or a little of the time”, “Some of the time”, “Good part of the time”, or “Most or all of the time”. Raw scores range from 20 to 80, with higher scores being indicative of more severe depression. The SDS has demonstrated split-half reliability

of .81 (Zung, 1965), .79 (DeJonge and Baneke, 1989) and .94 (Gabrys and Peters, 1985). Internal consistency (alpha) has been reported as .88 for depressed patients and .93 for non-depressed patients (Schaefer et al., 1985), and as .84 and .83 for previous Australian samples (Sharpley et al., 2009; Sharpley and Christie, 2007). The validity of the SDS has been shown to be superior to the MMPI Depression Scale and the Beck Depression Inventory for assessing depression in male psychiatric patients identified via the Structured Clinical Interview for Depression (APA, 2000; Schaefer et al., 1985). SDS scores of 40 or above indicate the presence of “clinically significant depression” (Zung, 1973, p. 335). SDS raw scores were used in this study.

Depression subtypes: As described in the Introduction to this paper, although depression is often referred to as a unitary construct (e.g., the Major Depressive Episode and Major Depressive Disorder classifications in the DSM-IV-TR and ICD-10), depression may also be characterised by certain “specifiers” such as melancholic features, catatonia features, or reactive features (DSM-IV-TR). MDE occurs when a person presents with at least five symptoms that are present most of the day, nearly every day. Those symptoms include at least one of the two key criteria: (i) being depressed or sad (*depressed mood*) or (ii) having markedly decreased interest or pleasure in all, or nearly all, activities (known as *anhedonia*). A patient must also suffer from a number of other symptoms to make up the five required for a diagnosis of MDE, including: significant weight loss when not dieting or weight gain or decrease in appetite; insomnia or hypersomnia; psychomotor agitation or retardation; fatigue or loss of energy; feelings of worthlessness or excessive or inappropriate guilt; diminished ability to concentrate or think or indecisiveness; recurrent thoughts of death or suicidal thinking (APA, 2000).

Therefore, the symptomatology for MDE may be seen as consisting of several key aspects, including cognitive, somatic and emotional (i.e., depressed mood) criteria, and these key aspects may have different biological underpinnings and contribute in different ways to the overall experience of depression. For example, *depressed mood* is commonly linked with central serotonergic dysfunction (Hassler et al., 2004), is probably the most easily recognized and familiar of these two key criteria (to the general public) simply because it reflects the ‘feeling sad’ aspect of depression, and therefore is centrally associated with the overall cognitive and emotional experience of being depressed (APA, 2000). By contrast, *anhedonia* may be less well-known, is associated with catecholaminergic dysfunction (Hassler et al., 2004), and is sometimes considered to be linked with melancholic depression, when it is accompanied by other symptoms of MDE such as psychomotor agitation, excessive guilt or hopelessness, suicidal thoughts, and loss of weight or appetite (Clark and Watson, 1991; Leventhal and Rehm, 2005). Patients with this symptomatology have distinct biological features that include dysfunction of the hypothalamic-pituitary-adrenal axis, the thyroid function, rapid eye movements during sleep, and left dorsolateral prefrontal cortex activity (Sharpley and

Bitsika, 2010). The presence of these features has also been associated with greater benefit from pharmacological treatments than from psychotherapy (Sharpley and Bitsika, 2011), thus suggesting a potential implication for treatment of patients whose depression symptomatology reflects an anhedonic bias. *Melancholic depression* includes anhedonia as a required aspect of the symptomatology, but also includes early waking, feeling worse in the morning, psychomotor agitation or retardation, anorexia or weight loss and inappropriate guilt, thus encompassing a wider range of symptoms than anhedonia alone. Similarly, *somatic depression* focuses upon the presence of multiple somatic characteristics from the MDE list, and *cognitive depression* is signified by severe impediments in concentration and/or ability to think clearly.

For the present study, these five subtypes of MDE (i.e., Melancholic depression, Depressed Mood, Anhedonic, Somatic, and Cognitive Depression) were selected for examination because (i) they are commonly reported in the wider literature (ii) they represent significant aspects of the DSM-IV-TR symptomatology for this disorder, (iii) their basic symptomatology overlaps only marginally if at all, and (iv) they have been shown to require different treatment approaches. Because the SDS taps all the symptoms of MDE, plus several others which are required by the definitions of the five subtypes of depression described above, it can also be used to measure the subset of SDS items which are features of these subtypes of MDE.

Two steps were taken to identify the relevant SDS items for each depression subtype. First, in order to identify which SDS items tapped the symptoms of MDE, the authors (both clinical psychologists who between them had over five decades experience in assessing and diagnosing MDE) blindly allocated SDS items to the various MDE criteria from the DSM-IV-TR. Second, by reference to the DSM-IV-TR symptoms, the various SDS items were then allocated to each of the five depression subtypes using the same blind process, and with reference to major definitions of each of the five subtypes (Antonijevic, 2006; APA, 2000; Feinberg, 1992; Parker et al., 2002; Pelle et al., 2010). Inter-rater agreement for this task was 96% and any disagreements were resolved by consensus. Table 1 shows each of the five depression subtypes, plus a list of the relevant SDS items which measured the symptoms of those depression subtypes that were found in the wider literature. All subtypes had at least 2 SDS items to calculate the subtype score. Although this may be fewer than ideal, and could possibly produce some unreliability in subtype designation, this is unavoidable due to the restricted number of symptoms which are allocated to each subtype by the overall DSM-IV-TR criteria for MDE. In addition, the use of the mean scores for each of these five subsets of SDS items were used (providing a possible range from 1 to 4 for those mean scores), thus reducing some of the possibility of false positives being recorded, as well as enabling direct comparisons between depression subtype scores.

Table 1: Five depression subtypes and relevant SDS items, means, SDs, medians and ranges

Subtype	Melancholic	Depressed mood	Anhedonic	Somatic	Cognitive
SDS items	<ul style="list-style-type: none"> - Morning is when I feel best - I eat as much as I used to - I notice that I am losing weight - I still enjoy sex - My heart beats faster than usual - I am restless and can't keep still - I am more irritable than usual - I feel that I am useful and needed - My life is pretty full - I feel that others would be better off if I was dead - I still enjoy doing the things I used to 	<ul style="list-style-type: none"> - I feel downhearted and blue - I have crying spells or feel like it - I feel hopeful about the future 	<ul style="list-style-type: none"> - My life is pretty full - I still enjoy doing the things I used to - I still enjoy sex 	<ul style="list-style-type: none"> - I eat as much as I used to - I notice that I am losing weight - I have trouble sleeping at night - My heart beats faster than usual - I am restless and can't keep still - I am more irritable than usual 	<ul style="list-style-type: none"> - My mind is as clear as it used to be - I find it easy to make decisions
Mean	1.914	1.632	1.922	2.169	2.337
SD	.439	.549	.671	.613	.816
Median	1.818	1.667	1.667	2.000	2.500
Range	1.00 to 3.27	1.00 to 4.00	1.00 to 4.00	1.20 to 4.00	1.00 to 4.00

Stressors of University Study: The Revised Effects of University Study on Lifestyle Questionnaire (R-EUSLQ) consists of 42 items which represent the most common challenges and stressors that students have reported experiencing (Bitsika et al., 2009), which caused them to feel most stressed and which were found to be significantly associated with anxiety and depression (Bitsika et al., 2010c). Original development and subsequent revision of the EUSLQ have been previously described (Bitsika et al., 2011; Bitsika et al., 2010a; Bitsika et al., in press; Bitsika et al., 2010b; Bitsika et al., 2010d; Bitsika et al., 2009). In the revised version of the R-EUSLQ that was used in this study, the same four-option response scale was used as for the SDS, giving a possible range of scores from 42 to 168, with higher scores indicating that participants had experienced more lifestyle challenges and stressors. As well as establishing its psychometric structure, previous evaluation of the R-EUSLQ indicated the presence of five factors which were named: (1) Anxiety due to study demands, (2) Financial problems, (3) Psychological distress and loneliness, (4) Health concerns, and (5) Time pressures (Bitsika et al., 2010a).

Procedure

Participants were recruited by assistants (not the authors) via informal advertisements placed in the university inviting students to participate in a study about "how you have experienced university study". After agreeing to participate, students completed the survey questionnaires individually and anonymously. The questionnaires were stored in a secure location before coding for subsequent data analysis. Ethical

approval was obtained from the Bond University Human Research Ethics Committee

Results

Psychometric data

Table 2 shows the relevant psychometric data for the SDS and R-EUSLQ. On the basis of Zung's cut-off score of 40 to indicate the presence of "clinically significant" depression, 141 (35.4%) of the sample may be categorised as suffering from at least some degree of clinical depression, which is higher than the wider population (APA, 2000) but congruent with some previous data on student samples that was reported in the Introduction to this paper (Alloy et al., 2006). The Kolmogorov-Smirnov statistics for both scales were satisfactory, skewness and kurtosis were minor, and inspection of the Boxplots, the Normal Q-Q Plots, the Detrended Normal Q-Q Plots, plus the histograms indicated that data from the SDS and R-EUSLQ satisfied normality requirements. The only outliers present were genuine scores and so were included in further analyses.

Table 2: Psychometric data for SDS and R-EUSLQ

	SDS	R-EUSLQ
Mean	37.809	89.072
SD	8.703	20.158
Range	20–69	46–168
5% trimmed mean	37.609	88.400
Cronbach's alpha	.85	.94

Table 3: Beta (standardised) coefficients and Regression outcomes for five R-EUSLQ factors against each of the five depressive subtypes

R-EUSLQ factor	Melancholic	Depressed mood	Anhedonic	Somatic	Cognitive
Anxiety due to study demands	226*	.249*	.009	.181*	<i>.377*</i>
Financial problems	.108	.042	.057	.041	.062
Psychological distress and loneliness	<i>.399*</i>	<i>.373*</i>	<i>.429*</i>	<i>.254*</i>	.171*
Health concerns	.029	.004	.031	.145*	.079
Time pressures	.059	.068	.084	.011	.134
R square	.271	.271	.150	.231	.221
F	29.126	29.196	13.878	23.589	22.205
p	<.001	<.001	<.001	<.001	<.001

* $p < .01$

tor 3. *Somatic depression* was significantly predicted by three of the R-EUSLQ factors (1, 3, 4), but hierarchical regression showed that factors 1 and 4 added only a further 3.2% and 1.3% to the power of factor 3 in the regression equation. *Cognitive depression* was most powerfully predicted by R-EUSLQ factor 1 (“Anxiety due to study demands”), and R-EUSLQ factor 3 added only a further 1.2% to the prediction equation.

Therefore, because ‘Psychological distress and loneliness’ was the most powerful R-EUSLQ factor for four of the five depressive subtypes, further analysis was undertaken of the items which comprised that factor with those four depression subtypes, again using an alpha of $p < .01$ to counter the effects of multiple t-tests (i.e., for the 7 R-EUSLQ items that comprised factor 3). For Cognitive depression, the 14 individual items for R-EUSLQ factor “Anxiety due to study demands” were similarly entered into the regression equation for that subtype of depression. All regression equations were statistically significant ($p < .001$), and all assumptions were met for each analysis.

As a summary of the series of analyses performed on these variables, Figure 1 shows the relationships (correlations) between the five depressive subtypes (shown in bold type), the R-EUSLQ factors (italics) which were significant predictors for each subtype and the individual R-EUSLQ items (in shaded boxes) from factors 1 (for Cognitive depression) and 3 (for Melancholic, Anhedonic, Somatic depression and Depressed mood) which were significant predictors of each depressive subtype. Statistically significant β values are shown in italics. The ‘centrality’ of the construct of melancholy in depression is shown by the fact that Melancholic depression correlated strongly with all four other depression subtypes, and accounted for 44.9% (Depressed Mood), 57.3% (Anhedonic depression, perhaps due to some overlap between SDS item groups for these two subtypes of depression), 59.5% (Somatic depression), and 32.2% (Cognitive depression) of the variance in scores on these other four depression subtypes. Second (and less powerful), Depressed Mood accounted for 27.3% of the variance in Anhedonic depression, 26.5% of the variance in Somatic depression, and 28% of the variance in Cognitive depression, also emphasising the importance of the ‘mood’ aspect of depressive symptomatology in these other subtypes and in depression overall. Third, a lower set of interrelationships was apparent between Somatic depression and Anhedonic depression (11.4%) and Somatic depression and Cognitive depression (12.2%). All these relationships were bi-directional, as shown

by the double-ended arrows joining the various depression subtypes.

Figure 1 indicates the importance of R-EUSLQ factors 1 (“Anxiety due to study demands”) and 3 (“Psychological distress and loneliness”) in predicting the five depression subtypes (as shown by the β values in italics). Similarly, when examined according to the component items within R-EUSLQ factor 3, only four items were statistically significant predictors of the four depression subtypes Melancholic, Anhedonic and Somatic depression and Depressed mood (“Feeling angry”, “Less self-confidence”, “Less free time” and “Decreased well-being”: all shown in shaded boxes), although differently dispersed across the four depression subtypes. The most powerful single R-EUSLQ item for melancholic depression was “Feeling angry”. For Depressed mood, “Feeling angry” was again the most powerful R-EUSLQ item, followed by “Less self-confidence”. For Anhedonic depression, “Less free time” was the most powerful predictor, followed by “Less self-confidence”. Somatic depression was most powerfully predicted by “Decreased well-being”. For Cognitive depression, none of the 13 R-EUSLQ items comprising factor 1 were statistically significant predictors of that depression subtype at the $p < .01$ level, and only one item (“Difficulty getting up in the morning”) was significant at the $p < .05$ level. This suggests that all of the 14 items contributed in small ways to Cognitive depression, but, when amalgamated, formed a more powerful entity.

Discussion

Although these data were gathered from a non-patient sample, over one-third of the sample had SDS scores which met the classification for “clinically significant depression” (Zung, 1965). However, because of the exploratory nature of this study and the ethical restraint which led to conducting it with a sample which was not comprised of clinically depressed patients, the findings should be treated with caution in terms of their generalisability to such patients.

Nevertheless, these data have value in two ways. First, some potentially valuable suggestions for future research with a clinical sample are possible from the current data. The incidence of the five subtypes of depression within a non-clinical sample suggests that it may also be valuable to consider these depression subtypes within the clinical population. If found to exist within clinical samples, depression

subtype scores could potentially assist patients and their therapists to target specific depression symptoms for treatment and to then focus upon the underlying stressors that most powerfully contributed to the symptoms. Further, there is an argument from these findings to support further research aimed at interweaving the range of evidence-based non-pharmacological treatment approaches when dealing with patients who present for treatment but who do not meet the criteria for severe or major depression (Cuijpers et al., 2008a; Cuijpers et al., 2009; Cuijpers et al., 2008b; Hollon et al., 2002). Such treatments might be based upon a detailed analysis of scores from standardised tests of depression or clinical interviews so as to provide information on subtypes of depression scores.

Secondly, when dealing with university students who present with depressive symptoms, addressing the underlying negative feelings that are most likely to trigger depressive symptomatology in this population, psychological distress and loneliness, plus anxiety about the demands of study, may be salient emotional targets for therapy. For example, when unpacked to the level of those specific stressors that in turn initiated these negative feelings in this sample, it appears that feeling angry and having low self-confidence, loss of free time, plus decreased well-being are the most common events or 'stress triggers' for four of the five subtypes of depression measured here. At least three of these stressors are amenable to interventions which focus upon self-behaviour change by students. That is, dealing with anger more effectively by identifying and challenging the specific cognitive beliefs that are the basis of the patient's anger, boosting self-confidence via structured activities that are designed to produce success, and using time management strategies to ensure that study targets are met, are all ways in which therapists might assist patients with these four subtypes of depression to reduce the actual stressors which initiate their negative feelings which lead to depression. In turn, overall improvement in feelings of well-being might emerge from addressing these three stressors. The contribution of "difficulty in getting up in the morning" to cognitive depression might be best understood for how that behaviour influenced patients' ability to meet their study or other work demands. That is, sleeping late might interfere with work commitments and reduce time for preparation of reports and study. In turn, sleeping late might be profitably explored with patients as being due to either late night activities and/or the previously-observed delay in circadian rhythm during adolescence and early adulthood (Giannotti et al., 2002). Although several medical suggestions have been made for assisting young people with this delayed 'body clock', such as use of melatonin (Abbott, 2003) and even supplementation of iron stores in the body (Kryger et al., 2002), therapists who work with patients whose waking and sleeping regimes are significantly different to those of their work environment, may also suggest behavioural strategies such as avoiding late night TV, parties or other social activities during their working week.

As explained in the Introduction, and applied here for ethical and logistic reasons, these data were collected from a selected sample of students at a particular university in Australia. As such, the findings do not include a clinically-impaired sample *per se*, and should not be immediately generalised to clinical patients. In addition, the generalisability of these data

may be limited for application to other geographic, cultural and occupational populations, and future studies might replicate this study in other nations and with different cultural and occupational groups, each of which may have their own specific set of environmental stressors which initiate depression. Second, although it is the most common practice in exploratory research such as in this study, the use of data from self-reports is limited in its agreement with the 'gold standard' of Structured Clinical Interview for Depression as set out in the DSM-IV-TR, and the collection of a subsample of participants' depressive status via such interviews would enable greater confidence in the validity of the self-report methodology. Third, data gathered from a cross-section 'snapshot' survey which does not permit analysis of changes in patients' depression subtypes over time following diagnosis and treatment are also limited in that they do not allow for conclusions to be drawn regarding the variability over time of patients' depression states, and greater confidence in the links between stressors and depression severity. Future research might gather data from a sample over (say) periods of relative low stress and high stress to test the strength of the links between stressors and depressive status. Finally, some overlap in symptoms and SDS items for a number of the depression subtypes is unavoidable. An alternative approach could be to examine participant's symptom profiles via appropriate statistical analysis (e.g., factor analysis and cluster analysis) to further clarify the characteristics of depressive subtypes that exist in various populations and then investigate the antecedent stressors that are most closely linked to those clusters of symptoms.

In conclusion, these data provide a starting point for understanding how a restricted non-clinical sample might experience depressive symptoms and how the form of those symptoms might vary. In addition, these data suggest how the various subtypes of depression examined here relate to each other, what are the most powerful stressors that 'cause' them, and how treatment options might more effectively focus upon the nature of (and stressors for) the particular type of depression that students may be experiencing. Although restricted in generalisability to actual patients suffering from clinical depression, these data suggest a possible avenue for future research with such patients, as well as having some implications for treatment of university students who present with symptoms of depression

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