Construct Validity of the EDS with Depression

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Abstract: *The Attributional Style Questionnaire [1] is a widely used scale that measures explanatory style when investigating the construct validity of the Reformulated Learned Helplessness Theory [2]. Despite its wide use, it has never been demonstrated to have satisfactory reliability or validity [3]. To address this, Travers, Creed, and Morrissey [4] successfully developed a more internally reliable and structurally valid measure of explanatory style, called the Explanatory Dimensions Scale (EDS), which achieved partial construct validity with the GHQ-12. It was recommended by Travers et al. that the construct validity of the EDS needs to be further investigated against established variables, including depression. Thus, we set out to investigate the construct validity of the EDS with depression in the community (termed depressive symptomatology), measured using the DASS and CES-D. Using two population samples, the structural validity of the EDS was again demonstrated, and the EDS retained improved alpha coefficients for all dimensions. Further, the EDS globality scale significantly but weakly predicted depressive symptomatology (5-6% of the variance) only when other known predictors of depressive symptomatology (non-productive coping, self-esteem, anxiety, and stress) were absent. Finally, we demonstrated that low self-esteem, anxiety and stress significantly mediated the relationship between globality and depressive symptomatology, and stress also moderated this relationship. Further recommendations and implications were discussed.*

Keywords: *Explanatory Dimensions Scale, validity, depression*

I. INTRODUCTION

The Attributional Style Questionnaire (ASQ; [1]) is a scale that has been used almost exclusively as a measure of explanatory style, when investigating the validity of the Reformulated Learned Helplessness (RLH) Theory by Abramson, Seligman, and Teasdale [2]. However, the ASQ has never been demonstrated to have adequate structural or construct validity, as outlined by Travers, Creed, and Morrissey [3], thereby rendering the RLH theory itself as lacking the tenets of a "good theory" as described by Epstein [5].

To address this, Travers, Creed, and Morrissey [4] set out to develop a more valid measure of explanatory style by: (a) rewriting the items measuring the existing internality dimension of explanatory style so that they reflect Lewin's [6] life space theory (the precursor theory to the construct of internality), and (b) reformat the ASQ so structural validity studies of the measure are not confounded due to the embedded "testlets" [7]. They did so by ensuring each item stem was followed by only one item, not three items which was the format of the original ASQ.

Results were successful in establishing a new scale (termed the Explanatory Dimensions Scale; EDS) that measures each dimension of explanatory style (globality, stability, and internality) with four items each. The EDS achieved structural validity using both EFA and CFA techniques, finding orthogonal components that were interpretable as the three dimensions of explanatory style. Further, Travers et al. achieved alpha coefficients for each of the dimensions of the EDS approaching acceptable to good (.68 to .78), reasoning that this was the first time a measure of explanatory style had achieved this. Interestingly, Travers et al. [4] were unable to find a second-order latent variable to justify the use of the composite scale score, adding that this was further evidence for the lack of validity of the ASQ. Finally, Travers et al. [4] found initial partial construct validity for the EDS with the GHQ-12 [8], finding weak significant correlations for the globality and stability dimensions (.15 and .13; p < .05). Construct validity was not established for the internality dimension, despite its improved internal reliability.

It was recommended by Travers et al. [4] that further research into the construct validity of the EDS needs to be conducted, initially with established outcome variables theorised to be related to the construct of explanatory style, such as depression.

1.1 Explanatory Style and Depression

Previous research on the construct validity of explanatory style with depression using the ASQ was summarised in Travers et al. [3]. Travers et al. detailed that, to date, the most that can be summarised from this research is that only the negative composite scale score of the ASQ is weakly related to depression (measured using the Beck Depression Inventory [BDI; 9]) in a young adult population, and that this relationship is strengthened to a moderate level if mediating variables such as brooding are considered. Further, Travers et al. [3] summarised that only one study reported the individual dimension results (see [10]), finding that the globality and stability subscales of the ASQ significantly correlated with the BDI (.30 and .25; *p* < .05), but the internality subscale did not significantly correlate with the BDI.

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It is noted in these previous investigations that a clinical measure of depression (the BDI) was utilised to measure depression within a student community sample. However, there are alternative measures of depressive symptomatology available that are appropriate for use with community samples and have excellent psychometric properties, including the Depression Anxiety Stress Scale (DASS; [11]) and the Centre for Epidemiological Studies Depression Scale (CES-D; [12]). Further, it is noted that only one study has reported the relationship of each dimension of explanatory style with depressive symptomatology [13]. Finally, previous research has demonstrated that coping ability [14, 15, 16], stress [15], anxiety [17, 18], and low self-esteem [15] are known predictors of depressive symptomatology in the community, but they are yet to be considered in this line of investigation as mediating or moderating variables.

1.2 Research Questions

Thus, the current study was conducted with two aims: (a) to confirm the structural validity of the EDS on further populations; and (b) to investigate the construct validity of each of the dimensions of the EDS with measures of depressive symptomatology in the community, whilst taking into consideration the indirect relationship that known predictor variables have on this relationship, including coping ability, stress, anxiety, and low self esteem.

It proposes to investigate these aims with three hypotheses: (a) that the structure of the EDS will be confirmed with a second and third population using confirmatory factor analysis (CFA), (b) that each dimension of the EDS (globality, stability, and internality) will return significant associations with the DASS depression subscale and the CES-D, and (c) the relationship between each dimension of explanatory style and depressive symptomatology will be either mediated or moderated by coping ability, stress, anxiety, and low self-esteem.

The current study was conducted in two phases. Phase 1 set out to confirm the structural validity of the EDS with a second and third population using CFA. Phase 2 investigated the direct and indirect relationships between each dimension measured by the EDS and community measures of depressive symptomatology.

II. METHOD: PHASE 1

2.1 Phase 1: Participants

Phase 1 was completed with two participant samples. Sample 1 consisted of 140 (108 female and 32 male) student and community participants, aged from 17 to 68 years ($M = 21.32$, $SD = 6.8$). Sample 2 consisted of 125 female student participants, aged from 16 to 43 years ($M = 21$, $SD = 6.0$).

All participants were recruited on a voluntary basis. The student participants responded to an advertisement on the course website. The community participants were recruited using a "snowball" procedure. All participants were treated in accordance with the university's Human Research Ethics Committee guidelines.

2.2 Phase 1: Materials

Explanatory Dimensions Scale (EDS). The EDS [4] is a 12-item scale developed to measure the dimensions of explanatory style in adults. It measures each dimension of explanatory style (globality, stability, and internality) with four items each. All items are answered along a 7-point Likert-like scale. The EDS has promising to acceptable internality reliability coefficients for all subscales ranging from $\alpha = .68$ for internality, to a $= .78$ for stability. The EDS has demonstrated good structural validity using both EFA and CFA techniques, and both the negative globality and stability subscales have initial partial construct validity with the GHQ-12, with correlations ranging from .13 to .15 ($p < .05$) [4].

2.3 Phase 1: Procedure

Following a brief overview of the research, student respondents were given the choice of completing the questionnaire immediately, or taking it away with them to complete. Questionnaires, together with details of the study, were disseminated to the community respondents via the student respondents. All respondents were given a reply paid addressed envelope and instructions to return the completed questionnaire. Data was analysed using SPSS version 19, and was password protected. Completed questionnaires were kept within a lockable filing cabinet.

III. RESULTS: PHASE 1

Data was initially examined for accuracy of data entry, missing values, outliers, and fit between their distributions and the assumptions of multivariate statistics. This resulted in no deletions. Next, two confirmatory factor analyses were conducted on each participant sample (Sample 1 and Sample 2) to confirm the factor structure of the EDS on these new samples. Results indicated a satisfactory fit to each set of data, confirming the factor structure and the structural validity of the EDS (see Table 1). Further, both sets of results indicated that the three factors of the EDS (the subscales) were not inter-related, thereby providing additional evidence for the need to consider each dimension of explanatory style as independent constructs, rather than dimensions of a larger unified construct. This result also violated the assumptions for a second order CFA analysis. Table 2 reports on the internal reliability alpha coefficients for all EDS subscales resultant from each CFA analyses.

Table 1: CFA Results of the EDS Model

Hypothesised Model	N	χ^2	df	p	GFI	CFI	RMSEA
EDS (12 items)[a]	140	43.01	51	.78	.95	.99	.00
EDS (12 items)[b]	125	73.76	51	.02	.92	.91	.06

Note. [a] = Sample 1 ($N = 140$), [b] = Sample 2 ($N = 125$)

Table 2: Internal Reliability Cronbach's Alpha Coefficients for all EDS subscales resultant from the CFA models on two further populations

EDS Subscale	Alpha (Sample 1; $N = 140$)	Alpha (Sample 2; $N = 125$)
Globality	.69	.68
Stability	.69	.67
Internality	.67	.68

IV. METHOD: PHASE 2

4.1 Phase 2: Participants

Sample 1 and Sample 2 participants, as described in Phase 1, also participated in Phase 2.

4.2 Phase 2: Materials

Besides the EDS described above, the following questionnaires were also administered to the participants.

Depression Anxiety Stress Scale (DASS). Depressive symptomatology, anxiety, and stress were assessed using the DASS [11] since this is an appropriate tool to assess mood states in the general population. The DASS is a 42-item questionnaire designed to measure depression, anxiety, and stress in non-clinical adults over the past week, on a 4-point Likert-like scale with endpoints ranging from *Did not apply to me at all to Applied to me very much, or most of the time.* Higher scores indicate increased symptoms in mood. Each subscale has sound internal consistency coefficients ranging from $\alpha = .84$ for anxiety, to a $= .91$ for depression. Further, the DASS has demonstrated structural validity, returning three orthogonal factors interpretable as the three subscales, using both EFA and CFA techniques [19]. Finally, the DASS has demonstrated construct validity with the BDI ($r = .74$) and BAI ($r = .81$) [19].

The Centre for Epidemiological Studies Depression Scale (CES-D). Depressive symptomatology in the general population was also measured using the CES-D [12]. The CES-D is a 20-item self-report scale designed to measure depressive symptoms in the general population over the past week. The CES-D assesses four domains of positive affect, somatic symptoms, interpersonal problems, and depressed affect. Items are answered on a 4-point Likert-like scale ranging from 0 *(rarely or none of the time)* to 3 *(most or all of the time)*. Scores are summed, and higher scores reflect greater depressive symptoms. The CES-D has been reported to have sound internal reliability, with an alpha coefficient of $\alpha = .85$ [12]. Further, the CES-D has good construct validity when compared with other measures of depression, with correlations coefficients ranging from $r = .65$ to $r = .77$ [20].

The Coping Scale for Adults (CSA). Coping ability was assessed using the Coping Scale for Adults (general, short form) (CSA; [21]). The CSA (general, short form) measures four dimensions of coping in adults with 19 items (there is one additional open ended question which was not used in this study). The four dimensions are "dealing with the problem", "non-productive coping", "optimism", and "sharing", which are measured with 18 items, and the final item measures "not coping". Each item is scored on a 5-point Likert-like scale, ranging from *Doesn't apply or don't do it to Used a great deal.* Frydenberg and Lewis [21] report adequate to excellent alpha coefficients for each of the coping strategies measured, ranging from $\alpha = .71$ to a $= .92$. Recently, Lewis, Roache and Romi [22] investigated the structural validity of the CSA on 515 adult community members (teachers). Their results indicated that the CSA measured three coping strategies: "passive avoidant strategies", "working at solving the problem with others, while remaining socially connected", and "relaxation". As different factor structures have been reported for the CSA, the factor structure was tested in this study (see below). Three factors were identified, which were similar to the three factors identified by Lewis et al., being "dealing with the problem", "non-productive coping", and "sharing". These factors were utilised in this study.

The Rosenburg Self Esteem Scale (RSES). Finally, self-esteem was measured using the RSES [22]. The RSES is a 10-item unidimensional scale which measures global self-esteem, scored using a Likert-like scale from 1 *(strongly agree)* to 4 *(strongly disagree).* The RSES has been reported to have sound internal reliability, with an alpha coefficient of $\alpha = .88$ [24]. Robins et al. [24] also reported good construct validity, with a median correlation of .75 with the Single-Item Self Esteem Scale (SISE, [24]).

4.3 Phase 2: Procedure

Sample 1 participants ($N = 140$) were administered the EDS, the CES-D, the CSA, and the RSES. Sample 2 participants ($N = 125$) were administered the EDS and the DASS. Both samples were administered the questionnaires in identical procedures as outlined in Phase 1.

V. RESULTS: PHASE 2

Data was initially examined for accuracy of data entry, missing values, outliers, and fit between their distributions and the assumptions of multivariate statistics. This resulted in no deletions. Next, given that the CSA did not have adequate structural validity reported, an exploratory factor analysis tested the factor structure on Sample 1. Principal components analysis (PCA) with three components to be extracted was used for the current analysis. The KMO measure of sampling adequacy was adequate (.59) and the Bartlett's Test of Sphericity was significant (< .001) indicating the matrix was suitable for factor analysing. Ensuring items loaded on components at .30 or higher, ten items of the CSA were eliminated, leaving a total of eight items measuring coping ability in a three factor solution, accounting for 61.6% of the variance. The final three factor solution was interpreted as "dealing with the problem (DP)" (items 3, 8, and 9), "non-productive coping (NC)" (items 14, 16, and 18), and "sharing (S)" (items 12 and 17). Cronbach alpha coefficients ranged from .61 for "non-productive coping" to .63 for "sharing", which are adequate for two and three item scales [25].

5.1 Sample 1 Data Set: Predicting Depressive Symptomatology (CES-D)

A series of regression analyses were conducted to (a) test the direct relationship between the EDS subscales and depressive symptomatology (CES-D); (b) test if the EDS subscales contribute to the prediction of depressive symptomatology (CES-D) over and above other known predictors of depressive symptomatology (coping ability and self-esteem); and (c) test whether the relationship between each EDS subscale and depressive symptomatology (CES-D) is either mediated or moderated by coping ability and self-esteem. Since theoretically coping ability and self-esteem could either mediate or moderate the relationship between explanatory style and depressive symptomatology, separate analyses were conducted to explore mediation and moderation.

All assumptions for all regression analyses were met. Non-productive coping ($r = .50$, $p < .01$), self-esteem ($r = -.51$, p < .01), and the EDS globality subscale ($r = .24$, $p < .05$) were significantly associated with depressive symptomatology as measured by the CES-D. Internality and stability were

included in the moderation analyses as main effects for the interaction terms entered at the last step in the analyses as is the procedure recommended by Baron and Kenny [26].

5.1.1 Examining direct relationships. Non-productive coping and self-esteem were entered into a linear regression analysis to examine their direct relationship with depressive symptomatology in this sample. As expected, non-productive coping accounted for a significant 12.3% of variance ($\beta = .33$. $p < .001$, $sr^2 = 12.3\%$) and self-esteem accounted for a significant 15.2% of the variance in depressive symptomatology ($\beta = -0.37$. $p < .001$, $sr^2 = 15.2\%$). Next, the EDS subscales were entered into a linear regression analysis to examine whether the EDS subscales predicted depressive symptomatology directly. Results indicated that the EDS globality accounted for a significant 5.8% of the variance in depressive symptomatology in this sample ($\beta = .24$, $p < .01$, $sr^2 = 5.8\%$). The other EDS subscales were non-significant.

To test if the EDS subscales predicted depressive symptomatology over and above known predictor variables (non-productive coping and self-esteem), a hierarchical regression analysis was conducted. Non-productive coping and self-esteem were entered at Step 1, and the EDS subscales were entered at Step 2. Results indicated that the significant variance initially accounted for by EDS globality became non-significant once non-productive coping and self-esteem were considered in the analysis ($\beta = .11$, $p = .12$, $sr^2 = 2\%$).

5.1.2 Examining mediation (with non-productive coping and self esteem). Following the mediation rules by Baron and Kenny [26], the significant predictor variable (EDS globality) was entered in Step 1 of a hierarchical regression analysis. The significant mediator variables (non-productive coping and self esteem) were entered at Step 2 in separate analyses. At this step, the beta (β) values for globality were observed for any reduction. If a reduction was observed, a mediation effect was indicated, and was tested for significance using the Sobels test [27] as is accepted practice.

Non-productive coping, as a mediator, was analysed first. The initial β value for EDS globality at Step 1 was significant, accounting for approximately 6% of the variance in depressive symptomatology, $\beta = .24$, $p < .01$, $sr^2 = 5.8\%$. At Step 2, when non-productive coping was added to the analysis, the β value for globality was reduced, but still significant, $\beta = .16$, $p < .05$, $sr^2 = 4.4\%$, indicating a possible partial mediation effect. The Sobels test of this reduction was not significant (Sobel = .07, $p = 0.95$), indicating that non-productive coping did not partially mediate the relationship between globality and depressive symptomatology.

Self-esteem as a mediator was analysed next. The initial β value for EDS globality at Step 1 was significant, accounting for approximately 5% of the variance in depressive symptomatology, $\beta = .23$, $p < .01$, $sr^2 = 5.3\%$. At Step 2, when self-esteem was added to the regression equation, the β value for globality was reduced and became non-significant, $\beta = .11$, $p = .15$, $sr^2 = 1.7\%$, indicating a possible full mediation effect. The Sobels test was significant (Sobel = 2.66, $p < .01$) evidencing that self-esteem fully mediated the relationship between globality and depressive symptomatology in this population (see Figure 1). Thus, the relationship between

EDS globality and depressive symptomatology can be explained as being due to low self-esteem.
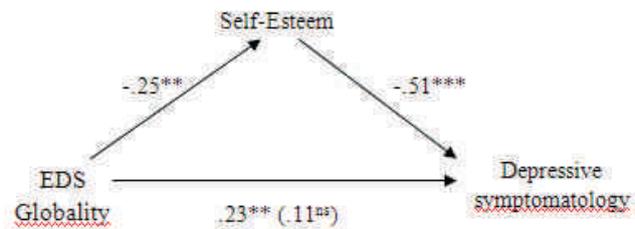

Figure 1: Self-Esteem (RSES) mediating the relationship between EDS globality and depressive symptomatology (CES-D); * = $p < .05$, ** = $p < .01$, *** = $p < .001$

5.1.3 Examining moderation (with coping ability and self-esteem). Following the moderation rules by Baron and Kenny [26], each EDS subscale (globality, stability and internality) were entered as predictor variables at Step 1, in three separate analyses. All moderator variables (non-productive coping and self-esteem) were entered at Step 2 for each analyses, and their respective interaction terms were entered at Step 3. None of the interaction terms in all analyses were significant thereby violating the assumptions for a moderation analysis [26]. Thus, non-productive coping and self-esteem do not moderate the relationships between any EDS subscale and depressive symptomatology in this population.

In summary, EDS globality accounts for a significant amount of variance in depressive symptomatology (5 – 6%) in this population, but its effects become non-significant when non-productive coping and low self-esteem are considered. Further, self-esteem fully explains (mediates) the relationship between EDS globality and depressive symptomatology.

5.2 Sample 2 Data Set: Predicting Depressive Symptomatology (with DASS)

Having investigated the EDS against the well validated measure of depressive symptomatology (CES-D), a second series of analyses was conducted to examine the EDS against another well validated measure of depressive symptomatology, the Depression Anxiety Stress Scale (DASS; [11]). A series of regression analyses were conducted to (a) examine the direct relationship between the EDS subscales and depressive symptomatology (DASS); (b) examine whether the EDS subscales contribute to depressive symptomatology over and above other known predictors of depressive symptomatology (anxiety and stress); and (c) examine whether the relationship between each EDS subscale and depressive symptomatology (DASS) is mediated or moderated by anxiety and stress. Separate analyses were conducted to test for mediation and moderation.

All assumptions for all regression analyses were met. EDS globality ($r = .23$, $p < .05$), anxiety ($r = .63$, $p < .01$) and stress ($r = .77$, $p < .01$) were significantly associated with depressive symptomatology as measured by the DASS. In line with suggestions by Baron and Kenny [26], internality and stability were included in the moderation analyses as

main effects for the interaction terms entered at the last step of each analysis.

5.2.1 Examining direct relationships. Anxiety and stress were initially entered into a linear regression analysis to examine their direct relationship with depression in this sample. Stress accounted for a significant 34.8% of the variance in depression ($\beta = .69$, $p < .001$, $sr^2 = 34.8\%$). Anxiety was non-significant in this sample, accounting for a non-significant 1.4% of the variance ($\beta = .11$, $p = .19$, $sr^2 = 1.4\%$). Next, the EDS subscales were entered into a linear regression analysis to examine whether the EDS subscales predicted depressive symptomatology directly. Results indicated that the EDS globality subscale accounted for a significant 4.8% of the variance ($\beta = .22$, $p < .05$, $sr^2 = 4.8\%$). The other subscales were non-significant.

A second regression analysis was conducted to examine whether the EDS subscales accounted for any variance in depressive symptomatology (DASS) over and above known predictor variables (anxiety and stress). Anxiety and stress were entered at Step 1, and the EDS subscales were entered at Step 2. Results indicated that the EDS globality subscale no longer accounted for any variance in depressive symptomatology after anxiety and stress were entered into the analysis ($\beta = .06$, $p = .33$, $sr^2 = 0.8\%$).

5.2.2 Examining mediation (with anxiety and stress). Using the same procedures as previously described with the Sample 1 data, the significant predictor variable (EDS globality) was entered in Step 1 of an hierarchical regression analysis. The significant mediator variables (anxiety and stress) were entered at Step 2, in separate analyses, and any change in beta (β) values were examined for significance using Sobels test.

Anxiety, as a mediator, was analysed first. The initial β value for EDS globality at Step 1 was significant, accounting for 5.3% of the variance in depressive symptomatology, $\beta = .23$, $p < .01$, $sr^2 = 5.3\%$. At Step 2, when anxiety was added to the regression equation, the β value for globality was reduced and became non-significant ($\beta = .13$, $p = .10$, $sr^2 = 2.3\%$) indicating a possible full mediation effect. The Sobels test of this reduction was significant (Sobel = 2.02, $p < .05$) indicating that anxiety fully mediated the relationship between EDS globality and depressive symptomatology (DASS) (see Figure 2).
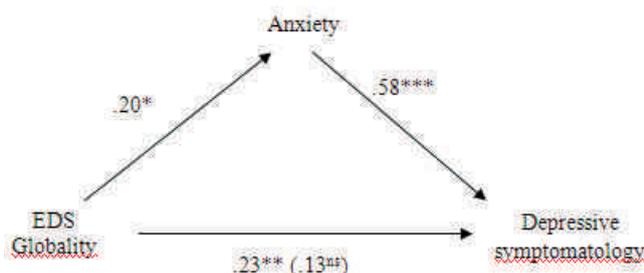
Next, stress was analysed as a mediating variable. The initial β value for EDS globality at Step 1 was again significant, accounting for 5.3% of the variance in depressive symptomatology, $\beta = .23$, $p < .05$, $sr^2 = 5.3\%$. At Step 2, when stress was added to the analysis, the β value for globality was again reduced and non-significant ($\beta = .07$, $p = .28$, $sr^2 = 1.0\%$) indicating a possible full mediation effect. The Sobels test of this reduction was significant (Sobel = 2.44, $p < .01$) indicating that stress also fully mediated the relationship between EDS globality and depressive symptomatology (DASS). Thus, the relationship between EDS globality and depressive symptomatology (DASS) can also be explained as being due to stress and anxiety.
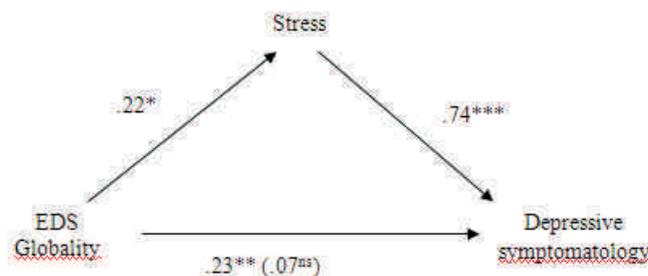

Figure 3: Stress mediating the relationship between EDS globality and depressive symptomatology (DASS). * = p < .05, ** = p < .01, *** = p < .001

5.2.3 Examining moderation (with anxiety and stress). Each EDS subscale was entered in the analysis at Step 1, as predictor variables, in three separate analyses. All moderator variables (anxiety and stress) were entered at Step 2 in each analyses, and their respective interaction terms were entered at Step 3. The interaction term between stress and EDS globality was significant, $\beta = .13$, $p < .05$, $sr^2 = 3.6\%$, indicating that stress influences the strength of the relationship between EDS globality and depressive symptomatology. No other interaction result was significant. This interaction effect was graphed using the computational tool provided by Dawson and Richter [28], which generated simple regression lines based on values of the moderator 1 SD above and below the mean (refer Figure 4). Figure 4 demonstrates that as globality attributions to a negative event increase, depressive symptomatology increases for those who were high in stress, however depressive symptomatology does not change for those low in stress.

Figure 2: Anxiety (Anx) mediating the relationship between EDS globality and depressive symptomatology (DASS).
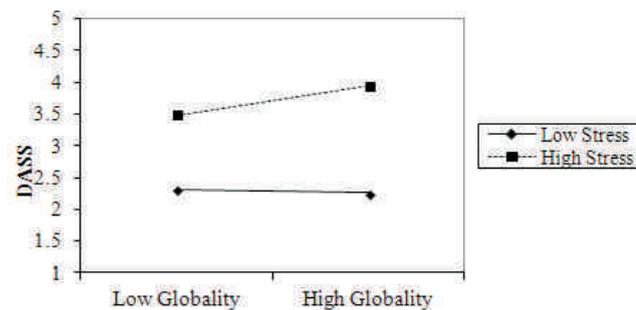* = p < .05, ** = p < .01, *** = p < .001

Figure 4: Stress moderates the relationship between EDS globality and depressive symptomatology (DASS)

Thus, when depressive symptomatology is measured using the DASS, results indicate that again the EDS globality accounts for approximately 5% of the variance in depressive symptomatology in this population, but its effects become non-significant when stress and anxiety are considered. Further, the relationship between EDS globality and depressive symptomatology can also be explained as being due to anxiety, as well as stress. Finally, besides explaining the relationship between depressive symptomatology in this population, it appears stress also strengthens this relationship. That is, depressive symptomatology in this population is strongest for those who are global in their attributions and are also high in stress.

VI. DISCUSSION

This study set out to achieve two aims: (a) to confirm the structural validity of the EDS on further populations, and (b) to investigate the construct validity of the EDS dimensions with depressive symptomatology in the general population as was recommended by Travers et al. [4]. The study was successful in the first aim, and partially successful in the second aim.

Specifically, the structural validity of the EDS was confirmed with a second and third population, using CFA techniques, as well as finding that the three components were not inter-related, thereby providing further support for the need to interpret the EDS at the dimensional level only. Furthermore, the internal reliabilities for all subscales resultant from these CFA results continue to be improved from those originally reported for the ASQ [1], and remain close to .70, which Nunnally [29] states is the minimum alpha coefficient required for a scale to be considered acceptable for research purposes. Together with the structural validity results achieved by Travers et al. [4], these are the only studies that have been successful in achieving structural validity results for a measure of explanatory style, with alpha coefficients for each subscale approaching acceptable levels for research purposes.

Secondly, the current study was successful in demonstrating the partial construct validity of the EDS with measures of depressive symptomatology in the general population, finding that the EDS globality consistently contributed 5% to 6% significant variance to depressive symptomatology measured by both the CES-D and DASS. This study replicates previous studies in this area, including that by Luten, Ralph and Mineka [10], who also found a significant relationship between globality and depression (measured using the BDI; [9]), and by Travers, Creed and Morrissey [4], who found a significant relationship between EDS globality and negative affect measured by the GHQ-12 [8]. Luten et al. [10] and Travers et al. [4] also found a significant relationship between stability and depression or negative affect, which was not supported in the current study. This could be explained as being due to results of the sample size. The current study was conducted with sample sizes of 140 and 125, whereas Luten and colleagues investigated a sample size of 229, and Travers and colleagues investigated a sample size of 396. Future studies would need to ensure large sample sizes to ensure statistical power in the analyses.

Besides demonstrating the direct relationship between EDS globality and depressive symptomatology, the current study was also successful in demonstrating the mediating/moderating effects of known predictor variables on this relationship. Specifically, the current study demonstrated that low self-esteem, anxiety, and stress explain (mediate) the relationship between EDS globality and depressive symptomatology in this population. Only one study has previously found a significant mediating effect of a variable on the relationship between globality and depression, by Lo, Ho, and Hollon [13]. Lo et al. found that brooding significantly mediated the relationship between negative explanatory style (composite score) and depression. Thus, the current study has improved on these findings by finding three further mediating variables on this relationship, as well as isolating which explanatory style dimension (globality) that these mediating variables are interacting with to explain their effects on depression.

Finally, the current study demonstrated that high stress also strengthens (moderates) the significant relationship between EDS globality and depressive symptomatology in this population. That is, for those in the general population that experience depressive symptomatology as a result of their global attributions, those that are also experiencing high stress will have their depressive symptoms exacerbated, compared to those who are not under stress at the time. This study appears to be the first to find a significant moderation result (stress) on the relationship between EDS globality and depression.

The current results need to be interpreted against the limitations of the study, including the reliance on young adult student populations, the lack of diversity in the sample and the experimental setting, and the limited sample size. Together these results were successful in confirming the structural validity of the EDS on two further populations, and confirming the construct validity of the EDS globality subscale against depressive symptomatology. However, the EDS stability and EDS internality subscales remain unvalidated. This is despite their improved internal reliability, as reported in Travers, Creed, and Morrissey [4] and Phase 1 of this study. Thus, it is recommended that further investigations into the construct validity of each dimension measured by the EDS be conducted, with the aim of establishing the construct validity of not only the EDS globality subscale, but also the EDS stability and internality subscales. Since the ASQ has also been investigated with short term ill health and achievement, it is recommended that the construct validity of the EDS be investigated with these outcome variables. Finally, since the current study was the first study to find significant mediation and moderation results on the relationship between EDS globality and depressive symptomatology, it is recommended that further studies also need to investigate the presence of mediation and moderation effects of known predictor variables on the relationships between the EDS subscales and outcome variables.

Clinically, the current findings help to inform practitioners when treating clients with depression. Specifically, those clients with depression and have been observed to have global thinking styles (e.g., *my whole life is negative*),

may benefit from treatment that targets their low self-esteem, anxiety, and stress. Further, clinicians are informed from this research that clients with depression and global thinking styles are at risk of more severe depressive symptoms if they are also experiencing stress.

Empirical implications include the need for the EDS to be interpreted at the dimensional level only, and not to sum the subscales to arrive at a total scale score.

VII. REFERENCES

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