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Randomised Controlled Trial of a Web-Based Acceptance and Commitment Therapy

(ACT) Program to Promote Mental Health in University Students

ONLINE ACT PROGRAM FOR UNIVERSITY STUDENTS

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### Abstract

**Objective:** This study evaluated a 4-week web-based Acceptance and Commitment Therapy (ACT) mental health promotion intervention for university students.

**Method:** Participants were randomised to intervention ( $n = 596$ ) or waitlist control ( $n = 566$ ). Assessment of primary outcomes (depression, anxiety, stress, well-being, self-compassion, life satisfaction, and academic performance) and ACT processes (acceptance, cognitive fusion, education values, valued living, and present moment awareness) occurred at pre- and post-intervention and 12-week follow-up for intervention participants, and the same pre-post interval for waitlist control participants. **Results:** Analyses showed significant improvements from pre- to post-intervention compared to waitlist control on all primary outcomes and ACT

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processes. All intervention gains were maintained at follow-up. Improvements on all primary outcomes were mediated by three or more ACT processes in both samples.

Intervention effects were consistent across both sample groupings. **Conclusion:**

Findings provide support for a web-based ACT mental health promotion intervention for university students.

Keywords: Acceptance and Commitment Therapy, university students, web-based, mental health promotion, telepsychology.

University student mental health is a serious public health concern affecting many students across a wide range of disciplines (Bewick, Koutsopoulou, Miles, Slaa, & Barkham, 2010; Gallagher, 2012; Regehr, Glancy, & Pitts, 2013). A high proportion of students (83.9%) report elevated levels of distress (Stallman, 2010), almost half of whom are diagnosed with psychological disorders each year (Blanco et al., 2008). Furthermore, the majority of these students fail to seek help (Blanco et al., 2008; Stallman & Shochet, 2009). However, if most students with mental health problems sought help through university counselling services, wait times would be long with strained counsellor to student ratios of 1:4,340 (Stallman, 2012) in Australia and 1:1,604 in America (Gallagher, 2014). Elevated psychological distress adversely impacts student functioning in many areas including academic achievement, work, physical and emotional health, and quality of life (Andrews & Wilding, 2004; Vaez & Laflamme, 2008), and causes considerable long-term health and adjustment problems (Rickwood, Deane, Wilson, & Ciarrochi, 2005). These findings highlight the need for university-wide transdiagnostic mental health promotion interventions that target comprehensive skills training. Transdiagnostic approaches, such as ACT, are likely to have greater reach than disorder-focused approaches in the context of a larger target

population. Such approaches also fit well within the university setting as they are more likely to encompass the major areas of dysregulation present in some students (Craske, 2012; Hayes, Pistorello, & Levin, 2012).

Web-based psychological interventions are efficacious in targeting specific mental health problems in students (e.g., Beintner, Jacobi, & Taylor, 2012; Christensen, Griffiths, & Jorm, 2004; Croom et al., 2015) and are a preferred avenue for students to obtain information and services (Ryan, Shochet, & Stallman, 2010). Web-based interventions facilitate skill development around a busy schedule, allow participants to choose programs that suit their needs, and reduce the impact of stigma associated with attending appointments (Amstadter, Broman-Fulks, Zinzow, Ruggiero, & Cercone, 2009; Eisenberg, Golberstein, & Gollust, 2007).

A limitation of standalone web-based psychological interventions is that effect sizes tend to be small (Cuijpers, van Straten, & Andersson, 2008) compared to face-to-face therapy, guided self-help, or web-based programs where participants have therapist contact (Farrand & Woodford, 2013). However, given two-thirds of students needing help will not seek it, (Stallman & Shochet, 2009) other alternatives for mental health promotion require investigation. Web-based transdiagnostic informed mental health promotion interventions are required in order to maximise reach and address a wide range of deficits among students (Craske, 2012).

Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2011) is an empirically supported transdiagnostic approach which fosters mental health skills through the development of psychological flexibility (Biglan, Hayes, & Pistorello, 2008). Numerous reviews and meta-analyses indicate that ACT is effective in improving mental health and well-being in clinical and non-clinical populations (A-Tjak et al., 2015; French, Golijani-Moghaddam, & Schröder, 2017; Ruiz, 2012).

According to the ACT framework, psychological flexibility is enhanced through six core processes (acceptance, cognitive defusion, present moment awareness, flexible perspective taking, values, and committed action), which constitute important skills for enhancing mental health (Hayes et al., 2011). A recent meta-analysis showed that ACT delivered in self-help formats, such as web-based interventions, had beneficial effects on depression, anxiety, and psychological flexibility, especially when accompanied by clinician guidance (French et al., 2017). However, this analysis also stated that effect sizes were small and methodology and reporting bias may inflate effect sizes (French et al., 2017). In addition, web-based ACT interventions with varied levels of practitioner involvement for students have shown improvements in many areas including education values, depression, social anxiety, academic concern, well-being, values obstruction, mindful acceptance, life satisfaction, and academic performance (Chase et al., 2013; Levin, Haeger, Pierce, & Twohig, 2016; Levin, Pistorello, Seeley, & Hayes, 2014; Rasanen, Lappalainen, Muotka, Tolvanen, & Lappalainen, 2016). ACT interventions delivered in other formats with students have shown improvements on a similarly wide range of outcomes (Muto, Hayes, & Jeffcoat, 2011; Pakenham, 2015; Stafford-Brown & Pakenham, 2012).

The current study addressed limitations of previous web-based ACT mental health promotion studies for university students, by including all six ACT core processes, a larger sample size, a wide range of outcomes and ACT process measures, cultural validation of ACT web-based interventions for students beyond North America and Finland, and more rigorous testing of the influence of ACT processes and academic behaviours in a standalone web-based intervention. In addition, previous web-based ACT interventions for university students have targeted clinical populations, such as those with elevated depression, anxiety, or psychological distress

(Levin, Haeger, et al., 2016; Levin, Hayes, Pistorello, & Seeley, 2016; Levin et al., 2014; Rasanen et al., 2016). A broader mental health promotion approach, as used in the present study, is required to reach students who do not identify as needing mental health assistance, but may benefit from learning mental health skills (Eisenberg, Golberstein, et al., 2007; Eisenberg, Gollust, Golberstein, & Hefner, 2007; Kim, Saw, & Zane, 2015), those with a mental health disorder who do not wish to seek formal treatment (Eisenberg, Gollust, et al., 2007; Stallman & Shochet, 2009), and those who may develop a mental health problem in the future (Stallman, 2010).

The aim of the present study was to evaluate the effectiveness of a web-based ACT mental health promotion intervention, called YOLO (You Only Live Once) in a randomised controlled trial. We hypothesised that compared to a waitlist control (WLC), the intervention participants would show significant improvements from pre- to post-intervention on the primary outcomes (depression, anxiety, stress, well-being, self-compassion, life satisfaction, and academic performance) and ACT processes (acceptance, cognitive fusion, present moment awareness, and values). It was also hypothesised that the ACT processes would mediate changes on the primary outcomes.

## **Method**

### **Participants, Recruitment and Procedure**

Participants were 1,162 university students from one Australian university. Eligibility criteria were enrolment at the university, fluent in English, and 18 years or older. Recruitment occurred through posters displayed at university services (e.g., student services and medical clinic), university Facebook posts, class announcements and a university wide email to students. Recruitment materials specified the YOLO Program was developed to promote self-development and well-being rather than

target mental health problems. Interested students accessed a website for more information and clicked to enrol in the study by providing their email address (university or otherwise), enrolled degree and confirming they met the age and English fluency requirements. Participants were monitored through the website's administration portal where the primary author could view levels of engagement and completion. Students were randomized using a random number generator to either the intervention or WLC and provided unique log-in details and instructions on how to proceed. Consent was obtained online whereby participants read a study information sheet and were invited to endorse either "agree" or "not agree" to participate. After consenting, all participants were automatically directed to complete the online pre-intervention assessment. No incentive or compensation was provided to students for participating in the study. A strategy tip sheet containing some of the intervention exercises was provided to intervention participants on completion of 12-week follow-up assessments and to waitlist participants on completion of post-intervention assessments; however, they were unaware of receiving this until just prior to completing the assessment.

### **Participant Flow and Characteristics**

A total of 2,158 potential participants expressed interest in participating in the YOLO Program. Of these, 2,110 were eligible to participate and were randomised to a condition and sent log-in information. Participants who did not complete 100% of the pre-intervention assessment were removed leaving a pre-intervention YOLO Program sample of  $n = 596$  and a WLC group of  $n = 566$ . A CONSORT (Consolidated Standards of Reporting Trials) flow chart of participant inclusion, and assessment and intervention completions for both groups is displayed in Figure 1. Sample characteristics of participants indicated 67.8% were female, 70.6% were domestic

students, 63.9% were undergraduate students, 23.5% were master's students, and 12.5% were research and higher degree (doctoral level) students. The mean age was 26.85 years ( $SD = 8.77$ ; median = 24; range = 18 - 65). All faculties of the university were represented with 22.9% from science, 19.4% humanities and social sciences, 18.2% health and behavioural sciences, 16.4% business, economics, and law, 10.9% engineering architecture and information technology, 9.6% medicine, and 2.5% missing or unclear.

**Intervention.** Once the pre-intervention assessment was completed, participants were given immediate access to the YOLO Program and instructed to aim to complete one module per week over 4-weeks, although they had flexibility to complete as desired within the 4-week period. After the 4-week intervention period expired, participants were advised that the post-intervention assessment was open on the Program website and were given 4-weeks to complete it. Sixteen weeks after completion of the pre-intervention assessment, participants were advised that the 12-week follow-up assessment was open and were given 4-weeks to complete it.

**Waitlist Control.** Once the pre-intervention assessment was completed, participants were advised of their allocation to the WLC group. To encourage waitlist retention, two emails were sent to participants advising of the number of weeks to their second assessment. Four-weeks after completion of the pre-intervention assessment, participants were given access to the second assessment which had to be completed in four-weeks. After completion of this assessment, participants were given access to the YOLO Program and provided with the same completion instructions and timeframe as the intervention group. After the 4-week intervention period expired, participants were advised that the post-intervention assessment was

open on the Program website and were given 4-weeks to complete it. No follow-up assessment was conducted on WLC participants.

**Monitoring of Participants.** Participants were monitored online through the YOLO Program administrator portal during the intervention periods and sent standard generic non-personalised reminder emails every 3-7 days to prompt Program engagement, until the 4-week completion window expired. Standard reminder emails for completion of all assessments were sent at 1-week intervals until the window for completion lapsed. Standard short message service (SMS) text messages or emails were sent at a relevant point in each module to reinforce Program content (see Table 1 for details). Standard emails were sent on module completion, providing a short video recap and instructions for the next module. The Program remained open to participants for 16-weeks (from the pre-intervention assessment for intervention participants and from the second assessment for WLC participants). The study received ethics approval by the university's internal review board (approval number 15-PSYCH-PHD-47-JS).

**YOLO Program.** The YOLO Program is a 4-week web-based intervention for university students consisting of four 30-45 minute modules, each targeting one or two of the six ACT core processes (Viskovich & Pakenham, 2018). Table 1 contains details of the YOLO Program content. Program exercises were 5-15 minutes duration. Modules could only be completed in sequential order. Previous exercises could be repeated, but participants could not progress forward until completion of the previous module, although a participant could skip an exercise if desired. The Program consisted of animated presentations, video clips, audio files and written exercises. No face-to-face contact occurred during the study. Modifications were made to the piloted YOLO Program based on participant feedback (Viskovich & Pakenham,



2018) as follows: the values module was moved to the beginning of the Program to enhance engagement, two additional videos were added to the values and defusion modules to further explain content, two additional interactive exercises were added to the defusion and acceptance modules to reinforce understanding, one exercise in the values module was changed to enhance content coherency, and disruptive cartoon aesthetics were minimised. In addition, the introduction of specific emails or SMS messages at relevant points of Program completion were introduced in order to reinforce the Program's content.

### **Measures**

Cronbach's alphas for all measures across all three assessments and in both groups were  $\geq .75$  and are presented in Table 2.

### **Primary Outcomes.**

***Depression, Anxiety and Stress.*** The widely used 21-item Depression Anxiety and Stress Scale Short Form (Lovibond & Lovibond, 1995) measured depression, anxiety and stress. Participants rate how much each statement applied to them over the past week on a 4-point scale (0 *did not apply to me at all* to 3 *applied to me very much or most of the time*) with higher scores indicating higher distress. Items are summed for each subscale and multiplied by two for comparison to the 42-item parent measure.

***Well-Being.*** The widely used 14-item Mental Health Continuum Short Form (Keyes, 2009) measured well-being. Each item is rated on a 6-point scale (0 *never* to 5 *every day*) with higher mean scores indicating higher well-being.

***Self-Compassion.*** The widely used 12-item Self-Compassion Scale Short Form (Raes, Pommier, Neff, & Van Gucht, 2011) measured self-compassion. Participants rate how they typically act towards themselves in difficult times on a 5-point scale (1

*almost never to 5 almost always*) with higher mean scores indicating higher self-compassion.

**Life Satisfaction.** The widely used 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) measured global life satisfaction in university students. Participants rate level of agreement on a 7-point scale (1 *strongly disagree* to 7 *strongly agree*), with higher scores indicating higher global life satisfaction.

**Academic Performance.** A brief 12-item scale was constructed to measure facets of academic performance including study habits, motivation to study, and overall grades or marks. Participants were asked to “Rate how well you are performing academically at university in the following areas over the last four weeks” on a 10-point scale (1 *performing at your worst* to 10 *performing at your best*) with an additional option to select ‘not applicable’. Sample items include: *Study discipline, Motivation to study, and Quality of your academic work*. Mean scores were calculated with higher scores indicating an increase in overall academic performance.

Exploratory factor analysis using principal axis factor extraction and direct oblimin rotation showed a clear 1-factor solution. Items with complex loadings or loadings <.40 were removed with successive factor analyses, until a stable, single-factor was achieved. Seven items were retained for the final scale accounting for 65% of the variance ( $\alpha$  range = .93 to .94).

#### **ACT Processes.**

**Acceptance.** The widely used 7-item Acceptance and Action Questionnaire II (Bond et al., 2011) measured experiential avoidance, which is the reverse process of acceptance. Responses are recorded on a 7-point scale (1 *never true* to 7 *always true*). Scores are totalled with higher scores indicating lower acceptance.

**Cognitive Fusion.** The 7-item Cognitive Fusion Questionnaire (Gillanders et al., 2014) is a reliable and valid measure (McCracken, DaSilva, Skillicorn, & Doherty, 2014) of cognitive fusion, the reverse of defusion. Responses are recorded on a 7-point scale (1 *never true* to 7 *always true*). Scores are summed with higher total scores indicating greater cognitive fusion.

**Values.** Two values domains were measured: education values and general values-based living. **Education Values.** The 9-item education values subscale of the Personal Values Questionnaire II (Blackledge, Ciarrochi, & Bailey, n.d.) was used. Participants are asked for a written response regarding their education values, combined with questions that assess three areas of education values: values success, intrinsic/appetitive values motivation (e.g., positively reinforced by making their life meaningful) and extrinsic/aversive values motivation (e.g., used to avoid/escape unwanted thoughts and feelings). Items are rated on a 5-point scale and a mean is created for values success as well as a ratio score, calculated by dividing scores on extrinsic/aversive motivation by intrinsic/appetitive motivation. Lower scores indicate the value is more intrinsic/appetitive. Previous ACT student intervention studies have found this measure to be reliable and valid (Levin et al., 2014). **Value Based Living.** The 16-item Engaged Living Scale (Trompetter et al., 2013) is a reliable and valid instrument measuring values-based living (Trompetter, Bohlmeijer, Veehof, & Schreurs, 2015). Responses are recorded on a 5-point scale (1 *completely disagree* to 5 *completely agree*). A total score is calculated with higher scores indicating higher valued living.

**Present Moment Awareness.** The well-established 15-item *Mindful Attention Awareness Scale* (Brown & Ryan, 2003) was used to measure present moment

awareness. Responses are recorded on a 6-point scale (1 *almost always* to 6 *almost never*). Higher mean scores indicate higher levels of present moment awareness.

**Measures of Participant Descriptive Characteristics.** Demographic information was obtained for age, gender, student domestic/international status, degree type (undergraduate, masters, and research and higher degree) and degree title (open-ended: coded into university faculty).

**Program Performance Measures.**

**System Usability.** The widely used 10-item *System Usability Scale* (Brooke, 1996) measured online program usability. It provides a global view of subjective assessments of usability. Items are rated on a 5-point scale (1 *strongly disagree* to 5 *strongly agree*) with scores ranging from 50 to 100. Higher scores indicate higher system usability.

**Participant Satisfaction.** Four open-ended questions obtained feedback on Program impacts, likes, dislikes, and device issues. Four forced-choice questions inquired whether participants would recommend the Program to other students, the helpfulness of email reminders, viewing of the weekly recap videos, and type of device used.

**Data Analysis Approach**

Missing data was extensively analysed. Little's Missing Completely at Random test on post-intervention  $\chi^2(489, N = 309) = 446.25, p = .917$  and 12-week follow-up scores  $\chi^2(446, N = 249) = 394.39, p = .962$  indicated data was missing completely at random. In addition, multivariate and chi-square analyses used to compare post-intervention and follow-up completers versus non-completers on all outcomes and demographics at these assessment points revealed three significant differences at  $<p$

.05. One for student type (domestic versus international)  $\chi^2 (1, N = 595) = 3.99, p = .046$  with international students being less likely to complete than domestic students; age  $F (1, 591) = 13.09, p = <.001$  with older students being more likely to complete than younger students; and degree level  $\chi^2 (2, N = 595) = 22.43, p = <.001$ , with research and higher degree students completing less than undergraduate and master's students. Further analyses investigating data not missing at random due to specific outcome measures, found 2.3% was not missing at random, which is small enough to ignore (Scheffer, 2002). Loss of participant data appeared to be due to attrition at the assessment points and these percentages are similar to those found in the YOLO Program pilot study (Viskovich & Pakenham, 2018) and other web-based ACT intervention studies with similar intervention completion rates (Eustis, Hayes-Skelton, Orsillo, & Roemer, 2018; Levin, Pistorello, Hayes, Seeley, & Levin, 2015).

In line with the CONSORT guidelines (Moher et al., 2010), effects of the Program on primary outcomes and ACT processes were analysed using the following samples:

**Intention-to-Treat (ITT) Sample.** In order to provide a conservative estimate of intervention effects an ITT sample was created using multiple imputation. Missing data in the ITT sample was 48% at post-intervention and 68% at the 12-week follow-up. This sample ( $n = 1,162$ ) includes observed and imputed data from all randomised participants who completed the pre-intervention assessment, regardless of whether they used the intervention or completed subsequent assessments. Multiple imputation in SPSS was used to impute the data due to its robustness and reduced error rates compared to other methods (Rubin, 1996). Variables included in the model were all pre- and post-intervention primary outcomes and ACT processes for both conditions (Intervention vs WLC). Due to the high level of missing data, 40 imputations were

requested as this allows sufficient power retention to detect the false rejection of the null hypothesis (Graham, Olchowski, & Gilreath, 2007). The original results were compared against the imputed results for consistency. Trends were consistent; therefore, the pooled imputed results were reported.

**Per-Protocol (PP) Sample.** The PP sample contains intervention ( $n = 127$ ) and WLC ( $n = 364$ ) participants who adhered to the trial design (total  $n = 491$ ) with no data imputations. Trial design adherence included intervention participants who completed the intervention and all three assessments, and WLC participants who completed both assessments. Due to the uneven sample size, the assumption of equal variances was analysed using an Welch's t test calculator (Gaetano, 2019). Results showed that all between group variances were equal with exception of post-intervention scores for well-being and education values success. For these outcomes the Welch's t test was used to ensure unequal variances did not inflate the significance value of the repeated measures ANOVAs. Results indicated that compared to waitlist control, significant results were found for post-intervention well-being ( $t = 3.58, p = .001$ ) and education values success ( $t = 4.57, p = <.001$ ).

### **Statistical Analyses**

Preliminary analyses determined whether the intervention and WLC groups differed on study variables at pre-intervention using one-way ANOVAs and chi-square analyses. Intervention group post-intervention assessment completers and non-completers were compared on pre-intervention primary outcomes, ACT processes and demographics using one-way ANOVAs and chi-square analyses. As participants were given 4-weeks to complete the post-intervention assessment, the week in which they completed was examined to ascertain if it was associated with the outcomes. That is, a one-way ANOVA compared post-intervention scores for the intervention group with

the week in which they completed the assessment (week 1 – 4). Pre-intervention Depression Anxiety and Stress Scale scores were compared to norms.

Repeated measures ANOVAs examined changes from pre- to post-intervention between groups on primary outcomes and ACT processes for the ITT and PP samples. Additional repeated measures ANOVAs were conducted with the intervention group for the ITT and PP samples for post- to follow-up and pre- to follow-up.

An additional subset of analyses was conducted on intervention and WLC participants in the ITT sample whose pre-intervention distress scores fell in the clinically significant severe to extremely severe range using normative cut-off scores of depression  $\geq 21$ , anxiety  $\geq 15$ , and stress  $\geq 26$  (Lovibond & Lovibond, 1995): depression (intervention  $n = 76$ ; WLC  $n = 91$ ), anxiety (intervention  $n = 96$ ; WLC  $n = 125$ ), and stress (intervention  $n = 71$ ; WLC  $n = 73$ ). Repeated measures ANOVAs examined changes from pre- to post-intervention between groups for this subset of participants. In addition, clinically significant change was investigated using the reliable change index (RC; Jacobson & Truax, 1991). The decrease in scores necessary for reliable change equates to a decrease in scores of 2.85 for depression, 2.68 for anxiety, and 4.48 for stress. Further, level of intervention completion for this subgroup of distressed participants was investigated to ascertain if it differed from the larger sample.

Concurrent mediation analyses in both the ITT and PP samples were conducted using SPSS bootstrapping macro PROCESS (Preacher & Hayes, 2004) for mediation analyses incorporating the study conditions (e.g., pre- to post-intervention for intervention vs WLC). Pre- to post-intervention scores for each ACT process measure were examined as potential mediators of change on each significant pre- to post-intervention outcome. In addition, temporal mediation analyses in the ITT sample for

the intervention group only were conducted using bootstrapping macro MEMORE (Montoya & Hayes, 2016) for mediation analyses of single group repeated measures designs. Pre- to post-intervention scores for each ACT process measure were examined as potential mediators of change on each significant post-intervention to follow-up primary outcome. Effects of mediation were identified via bias corrected and accelerated (BCa) confidence intervals (CI) for the indirect effects using 5,000 bootstrapped samples. Mediation is significant if the 95% BCa CIs for the indirect effects does not include zero (Preacher & Hayes, 2004).

Two sets of analyses were conducted on intervention participants in the ITT sample to examine factors associated with intervention completion. First, multivariate ANCOVAs were used to ascertain if post-intervention scores on primary outcomes and ACT processes were associated with level of intervention completion, controlling for pre-intervention scores. Second, univariate ANOVAs and chi-square analyses examined whether pre-intervention primary outcomes, ACT processes and socio-demographics were associated with intervention completion.

Repeated measures ANOVAs and mediation analyses were conducted on the WLC participants who completed their post-intervention assessment ( $n = 188$ ). Descriptive analyses were performed on data from forced-choice questions for the full sample. All participant responses to open-ended questions were analysed according to Braun and Clarke (2006) steps for thematic analysis. A power analysis using G\*Power software indicated that to achieve 80% power to detect an effect size of  $d = 0.20$ ,  $p = <.01$  and a correlation between repeated measures of 0.5, 198 participants



per condition would be required. A significance value of  $p < .01$  was used for all analyses.

## Results

### Preliminary Analyses

There were no differences between the intervention and WLC groups at pre-intervention on primary outcomes, ACT processes or socio-demographics. Post-intervention assessment completers and non-completers did not differ significantly on pre-intervention primary outcomes, ACT processes or socio-demographics. Primary outcomes and ACT processes did not vary as a function of time of completion of the post-intervention assessment (weeks 1, 2, 3 or 4).

The following incidence rates of mild and moderate distress were found in the total sample at pre-intervention assessment ( $n = 1,162$ ): depression 40.3% ( $n = 468$ ), anxiety 39.1% ( $n = 454$ ) and stress 36.9% ( $n = 429$ ). Rates of severe and extremely severe symptoms were: depression 14.4% ( $n = 167$ ), anxiety 19% ( $n = 221$ ) and stress 12.4% ( $n = 144$ ).

### Changes in Primary Outcomes and ACT Processes

**ITT Sample.** Results of the repeated measures ANOVAs for the ITT sample are summarised in Table 3. Compared to the WLC group, intervention participants improved pre- to post-intervention on primary outcomes depression, stress, well-being, self-compassion, life satisfaction and academic performance and on ACT processes acceptance, cognitive fusion, education values, valued living, and present moment awareness with mostly small effect sizes evident. Intervention participants improved from post-intervention to follow-up on the primary outcomes anxiety  $F(1, 595) = 16.93, p < .001, d = .19, CI [.08, .31]$  and academic performance  $F(1, 586) = 13.95, p < .001, d = .16, 95\% CI [0.27, 0.16]$ , but evidenced a marginally significant

decrease in life satisfaction  $F(1, 595) = 5.39, p .02, d = .08, 95\% \text{ CI } [-.03, .20]$ .

Finally, pre-intervention to follow-up analyses indicated all outcomes and ACT processes increased significantly with none returning to pre-intervention levels.

**Clinical distress subgroup.** Regarding analyses on participants who reported severe and extremely severe levels of depression, anxiety and stress, compared to WLC, intervention participants improved from pre- to post-intervention on depression  $F(1, 166) = 11.56, p .001, d = .59, 95\% \text{ CI } [-0.90, -0.28]$ , anxiety  $F(1, 220) = 16.55, p <.001, d = .37, 95\% \text{ CI } [-0.64, -0.10]$ , and stress  $F(1, 143) = 13.51, p <.001, d = .48, 95\% \text{ CI } [-0.81, -0.14]$ . RC scores indicated for depression, 2.6% (2) of participants remained the same, 90.8% (69) improved, and 6.6% (5) deteriorated. For anxiety, 10.4% (10) remained the same, 81.3% (78) improved, and 8.3% (8) deteriorated. For stress, 14.1% (10) remained the same, 80.3% (57) improved, and 5.6% (4) deteriorated. Regarding intervention completion, participants with severe or extremely severe distress reported similar levels of intervention completion (all four modules) compared to the larger sample (34%). The percentages of participants in the severe and extremely severe ranges on each distress subscale who completed the intervention are as follows: depression, severe ( $n = 13, 39.4\%$ ) and extremely severe ( $n = 12, 27.9\%$ ); anxiety, severe ( $n = 22, 47.8\%$ ) and extremely severe ( $n = 15, 30\%$ ); stress, severe ( $n = 17, 32.7\%$ ) and extremely severe ( $n = 7, 36.8\%$ ).

**PP Sample.** Results of the repeated measures ANOVAs for the PP sample ( $n = 491$ ) are summarised in Table 3. Analyses showed that compared to WLC, intervention participants improved from pre- to post-intervention on all primary outcomes and ACT processes except education values ratio, which approached significance. Intervention participants reported significant improvement from post-intervention to follow-up on the ACT process valued living  $F(1, 123) = 7.04, p .009,$

$d = .15$ , 95% CI [-0.40, 0.09]. Further, marginally significant improvements from post-intervention to follow-up emerged on the primary outcomes anxiety  $F(1, 126) = 4.98$ ,  $p = .027$ ,  $d = -.20$ , 95% CI [-0.05, 0.44] and well-being  $F(1, 126) = 5.33$ ,  $p = .023$ ,  $d = .13$ , 95% CI [-0.36, 0.13]. Finally, pre-intervention to follow-up analyses indicated all outcomes and ACT processes increased significantly at  $p < .01$ , with none returning to pre-intervention levels.

### Mediation Analyses

**Concurrent mediation.** Mediation analyses indicated that compared to WLC, four of the ACT processes mediated improvements on six or more primary outcomes in the ITT and PP samples (see Table 4). The most frequent mediators of change across both samples were acceptance, cognitive fusion, valued living, and present moment awareness, which mediated changes on all primary outcomes.

**Temporal mediation.** Mediation analyses in ITT sample for the intervention only group indicated post-intervention to follow-up improvements in anxiety were mediated by pre- to post-intervention improvements in acceptance  $ab = -.35$ , BCa CI [-0.57, -0.20], cognitive fusion  $ab = -.48$ , BCa CI [-0.73, -0.30], valued living  $ab = -.19$ , BCa CI [-0.37, -0.06], and present moment awareness  $ab = -.19$ , BCa CI [-0.36, -0.07]. In addition, post-intervention to follow-up improvements in academic performance were mediated by pre- to post-intervention improvements in acceptance  $ab = .06$ , BCa CI [0.02, 0.10], cognitive fusion  $ab = .07$ , BCa CI [0.03, 0.13], valued living  $ab = .09$ , BCa CI [0.05, 0.14], and present moment awareness  $ab = .06$ , BCa CI [0.03, 0.11].

### Analysis of Intervention Completion

Intervention completion analyses used a five-level completion variable (did not start the Program, started/completed module 1, started/completed module 2,

started/completed module 3 and started/completed module 4) and pre- to post-intervention scores. Results of multivariate ANCOVAs showed that the pre-to post-intervention improvements on the primary outcomes and ACT processes varied as a function of intervention completion for depression  $F(4, 595) = 3.97, p = .003$ , anxiety  $F(4, 595) = 3.49, p = .008$ , self-compassion  $F(4, 595) = 3.64, p = .006$ , and academic performance  $F(4, 590) = 6.04, p = <.001$ . Simple contrasts using the fifth level of intervention completion variable (completed four modules) as the reference group, indicated significant mean differences in program completion levels. Compared to those completing four modules, participants who completed none of the Program reported lower academic performance  $t(4) = -.51, p = .002$ ; one module completers reported higher depression  $t(4) = 1.90, p = <.001$  and anxiety  $t(4) = 1.57, p = .001$ , and lower academic performance  $t(4) = -.53, p = <.001$ ; and two module completers reported lower self-compassion  $t(4) = -.21, p = .001$  and academic performance  $t(4) = -.55, p = .001$ .

Analyses examining whether pre-intervention primary outcomes, ACT processes and demographics for the intervention group were associated with intervention completion, indicated only education values success was marginally related to program completion  $F(4, 595) = 2.46, p = .044$ . Those who completed four modules of the Program reported marginally higher education values success compared to one module completers  $t(4) = -.409, p = .032$ .

### **Replication Analysis in WLC**

A replication experiment within the context of the study design was conducted with WLC participants who completed the post-intervention assessment ( $n = 188$ ) to ascertain if similar changes in primary outcomes and ACT processes were observed

after access to the Program. Repeated measures ANOVAs examined changes from the second assessment to post-intervention on primary outcomes and ACT processes.

Results were consistent with the main analyses showing significant improvements on all primary outcomes and ACT processes at  $p < .01$ . Mediation analyses also indicated a similar pattern to that of the main analyses with a minimum of three ACT process measures mediating all primary outcomes and valued living, cognitive fusion, and acceptance being the most frequent mediators of change.

### **Program Usability**

Compared to System Usability Scale norms (Sauro, 2011), YOLO Program mean scores from 477 participants (49%) were above average ( $M = 76.88$ ,  $SD = 15.08$ ), indicating participants found the Program easy to use, well integrated and consistent. Most (96%) participants used a laptop computer with only a few (4%) using phones and tablets. The majority (92%) of participants reported no difficulty viewing the Program on their device of choice. Participants accessed the Program via laptop or desktop computer (88%), phones (8%) and tablets (4%). A few (9%) mentioned difficulty with phone compatibility, password/login, connectivity, instructions, and problems with YouTube videos.

### **Participant Intervention Feedback**

Responses to open-ended questions were coded into themes with the four most frequently reported summarised below. A total of 288 participants responded to the open-ended question about Program impacts: 42% ( $n = 121$ ) self-awareness/insight, 31.3% ( $n = 90$ ) defusion impacts, 30.5% ( $n = 88$ ) changes in perspective, and 27.1% ( $n = 78$ ) tools/strategies provided. Only 2.4% ( $n = 7$ ) indicated the Program had no impact. A total of 283 participants responded to an open-ended question about Program likes. Responses fell into categories of Program and content likes. Program

likes included: 28.6% ( $n = 81$ ) videos, 22.3% ( $n = 63$ ) exercises/approach, 17.7% ( $n = 55$ ) easy to use, and 13.8% ( $n = 39$ ) structure. Content likes included: 10.6% ( $n = 30$ ) the helpful nature of the Program, 9.2% ( $n = 26$ ) real life examples/relevance, 9.2% ( $n = 26$ ) self-awareness/insight, and 8.1% ( $n = 23$ ) values. A total of 283 participants responded to an open-ended question about Program dislikes. Just over a quarter of participants noted no dislikes (26.5%  $n = 75$ ). For the remaining participants, dislikes were: 15.9% ( $n = 45$ ) content/specific exercises, 11.3% ( $n = 32$ ) too long, and 9.5% ( $n = 27$ ) access/time limit. Of the 294 respondents to the forced-choice question regarding recommending the Program to other students, 75% ( $n = 230$ ) would recommend the Program, 3% ( $n = 9$ ) would not recommend the Program, and 19% ( $n = 55$ ) unsure.

A total of 294 rated the helpfulness of emails and SMSs: 62% ( $n = 183$ ) helpful, 9% ( $n = 26$ ) unhelpful, and 29% ( $n = 85$ ) sometimes helpful. A total of 294 participants rated their preference for the frequency of reminders: 78% ( $n = 229$ ) right amount, 17% ( $n = 50$ ) too many, and 5% ( $n = 15$ ) not enough. A total of 294 participants indicated the extent to which they viewed weekly recaps: 24% ( $n = 71$ ) yes, 36% ( $n = 105$ ) no, 18% ( $n = 52$ ) sometimes, and 22% ( $n = 66$ ) watch later.

### **Discussion**

This study trialled a web-based ACT program, called YOLO, to promote mental health in university students. As predicted, compared to WLC, intervention participants improved from pre- to post-intervention on most primary outcomes and measured ACT processes with mostly small effect sizes. Intervention gains on most outcomes were maintained at follow up despite the marginally significant decrease in life satisfaction from post-intervention to follow-up, although it did not return to pre-intervention levels. Anxiety and academic performance in the ITT sample and valued

living in the PP sample continued to improve post-intervention to follow-up. Additionally, improvement post-intervention to follow-up on anxiety and well-being in the per-protocol analyses were marginally significant. Pre-intervention to follow-up analyses indicated significant intervention gains on all primary outcomes and ACT processes three months following Program completion. The improvements on distress, well-being, self-compassion, life satisfaction and the ACT processes, are consistent with results of the YOLO Program pilot study (Viskovich & Pakenham, 2018), and with previous web-based and face-to-face ACT intervention studies with university students (Levin, Haeger, et al., 2016; Levin et al., 2014; Muto et al., 2011; Rasanen et al., 2016; Stafford-Brown & Pakenham, 2012). A notable finding is the improvement in academic performance, a relevant outcome mostly neglected in other ACT intervention studies with university students.

A potential explanation for the marginally significant decrease in life satisfaction from post-intervention to follow-up is that the value's focus of the intervention may have sensitised participants to life domains associated with discontent around life purpose or agency. In support of this view, lack of agency and purpose in life has been found to be associated with lower life satisfaction in young adults ((Cotton Bronk, Hill, Lapsley, Talib, & Finch, 2009).

Pre- to post-intervention mediation analyses for each sample grouping indicated that all five measured ACT process measures mediated changes in three or more primary outcomes. In addition, analyses of WLC participants who received the intervention indicated three ACT process measures mediated changes on all primary outcomes. Further, temporal mediation analyses on the ITT intervention only group showed four of the core ACT processes mediated improvements at follow-up on anxiety and academic performance. Acceptance, cognitive fusion, and valued living,

ACT core processes, emerged as the most frequent mediators of change. To our knowledge, the present study and the YOLO Program pilot study (Viskovich & Pakenham, 2018) are the first web-based ACT interventions to show mediation of all the measured ACT processes across a wide range of primary outcomes. Of particular interest for this population, was the mediating role of education values with respect to depression, anxiety, well-being, self-compassion, and academic performance, particularly given that it has also been shown to be related to high grade point average (Chase et al., 2013; Paliliunas, Belisle, & Dixon, 2018). Education values are likely to play a potent motivating role in fostering both learning and personal wellbeing (Neff, Hsieh, & Dejitterat, 2005). Only a few ACT university student studies have investigated education values (e.g., Levin, Haeger, et al., 2016; Levin, Hayes, et al., 2016; Levin et al., 2014), and none have examined education values as a mediator of change.

Intervention completion analyses suggest potential variables responsible for drop-out in web-based mental health promotion programs for students, as well as providing areas for revised content aimed at increasing engagement for these sub-groups of participants. The association between elevated depression and anxiety and drop-out may suggest that students who have clinically significant distress require therapist contact, given that web-based psychological interventions with therapist involvement yield greater effect sizes than standalone web-based programs (Andersson & Cuijpers, 2009; Lappalainen et al., 2014; Rasanen et al., 2016). However, students who fell in the clinical range of distress were found to benefit from the intervention similarly to those who reported non-clinical distress and evidenced intervention completion rates that were similar to or exceeded those of the larger sample. Lower self-compassion was also associated with drop-out. In line with ACT's



values-based approach, Neff et al. (2005) found a link between self-compassion and mastery (values-based) goals, which allowed students to perceive failures as learning experiences, judge themselves less harshly and not over-identify with setbacks. Self-compassion may therefore buffer students against the stress of academic failures. Students with lower self-compassion may have dropped-out of YOLO Program because of feeling overwhelmed with academic challenges. Finally, lower education values and poorer academic performance were also associated with drop-out. Low commitment and connection to education values are likely to diminish sustained motivation to perform at a high level academically and, hence, dropping out of education related programs, such as the YOLO Program, is more probable (Reinwand et al., 2015). These findings indicate intervention enhancements are needed to further engage these sub-groups of participants earlier in the intervention. Additionally, given intervention drop-out occurred at varied intervals throughout the Program by a number of students, with and without distress, it is possible that these participants had a preference for other forms of support or felt they benefitted enough from the intervention to discontinue use.

Despite not targeting distressed students, the study found relatively high prevalence rates for mild to extremely severe levels of distress (38.7% - 58.5%), which were similar to those of the YOLO Program pilot study (48.5% - 58.5%, Viskovich & Pakenham, 2018) and other large scale university student mental health prevention studies (e.g., Stallman, 2010). Noteworthy is the effect of the YOLO Program on participants showing severe to extremely severe levels of distress. In addition, the rates of Program completion of distressed participants were similar to those of the larger intervention group sample (34%). Participants with severe depression (39.4%), severe anxiety (47.8%), and extremely severe stress (36.8%) all

reported 4-module completion rates above that of the larger intervention group sample. Further, those with extremely severe depression (27.9%) and anxiety (30%) also reported comparable levels to that of the larger intervention group sample. These findings highlight the potential benefits of a web-based transdiagnostic informed intervention for students across the distress continuum.

Despite being given no incentive to participate, over 2000 students responded to the invitation to take part in the study, and almost all participants that completed the post-intervention assessment (97.6%,  $n = 288$ ) reported significant positive impacts from participation and most (78%,  $n = 294$ ) reported they would recommend the Program to a friend. Importantly, descriptive and qualitative analyses on student feedback confirmed the statistical improvements. Program completion rates and post-intervention and follow-up assessment completion rates for the present study were relatively low, although they were slightly higher than those of the YOLO Program pilot study (Viskovich & Pakenham, 2018). Lower rates of attrition were documented in several ACT web-based studies with student populations (e.g., Levin, Hayes, et al., 2016; Levin et al., 2014; Rasanen et al., 2016); however, they also targeted clinically distressed students, included some therapist contact, and provided participation incentives. In contrast, other ACT intervention studies with therapist involvement, and one with an assessment completion incentive, also recorded similar completion rates to the present study, highlighting the variability of completion rates within this population (e.g., Eustis et al., 2018; Levin et al., 2015). High levels of attrition in standalone web-based programs do not necessarily indicate low student acceptability or effectiveness. Only a small (13%) proportion of participants who completed the pre-intervention assessment did not engage in the Program and there was a high repeat user rate (87%), defined as logging into the Program to complete an activity

more than once. The low completion rates fall within the range typically found in non-guided self-help websites (Richards & Richardson, 2012) and support the observation that students do not have to complete an entire intervention to benefit from it (Stallman & Kavanagh, 2016).

Study limitations include the high proportion (63.9%) of female participants, although this is typical of similar university student studies (e.g., Levin, Hayes, et al., 2016; Levin et al., 2015). Second, the high drop-out rate and associated levels of missing data is a potential limitation; however, results in both the ITT and PP samples were similar, the study had a large sample size, and findings replicated those of the YOLO Program pilot study (Viskovich & Pakenham, 2018). Third, the follow-up period was brief at 12 weeks and it is unknown if improvements were sustained beyond this point. However, the 12-week follow-up period matched or exceeded those of other similar studies (e.g., Levin, Hayes et al., 2016). Fourth, given a WLC was used, it cannot be said with certainty that the effects are due specifically to ACT versus another active treatment. Finally, the large number of tests undertaken increases the risk of Type I error rate; however, effect sizes were in the expected range of standalone web-based studies, significance values were mostly  $p < .01$ , and the qualitative and descriptive student feedback data converged with the statistical findings.

### **Conclusion**

Findings from this study support the effectiveness of the YOLO Program web-based ACT program for promoting mental health in university students. Findings showed that compared to WLC, intervention participation was associated with improved mental health skills such as acceptance, defusion, valued living, and present moment awareness, which show potential in improving well-being, self-compassion, life

satisfaction, distress and academic performance. Results were replicated within the WLC group, lending further support to the Program's effectiveness. Several variables were related to intervention drop-out, with lower academic performance showing the strongest association. All measured ACT processes mediated changes in the primary outcomes in both samples and pertinent to this population, education values mediated the changes in academic performance. This study highlights the potential of a transdiagnostic ACT web-based intervention to impact a wide range of mental health dimensions in a student population. An automated version of the YOLO Program is about to be offered as part of the University's suite of online well-being resources for students. This will allow further evaluation of the Program, as well as provide useful data on student uptake and the sustainability requirements for such a resource. The findings from this study contribute to the mounting evidence supporting the efficacy of evidence-based telepsychology interventions.

### References

- A-Tjak, J. G. L., Davis, M. L., Morina, N., Powers, M. B., Smits, J. A., & Emmelkamp, P. M. (2015). A meta-analysis of the efficacy of Acceptance and Commitment Therapy for clinically relevant mental and physical health problems. *Psychotherapy and Psychosomatics*, *84*(1), 30-36. doi: 10.1159/000365764
- Amstadter, A. B., Broman-Fulks, J., Zinzow, H., Ruggiero, K. J., & Cercone, J. (2009). Internet-based interventions for traumatic stress-related mental health problems: A review and suggestion for future research. *Clinical Psychology Review*, *29*(5), 410-420. doi: 10.1016/j.cpr.2009.04.001

- Andersson, G., & Cuijpers, P. (2009). Internet-based and other computerized psychological treatments for adult depression: A meta-analysis. *Cognitive Behaviour Therapy, 38*(4), 196-205. doi: 10.1080/16506070903318960
- Andrews, B., & Wilding, J. M. (2004). The relation of depression and anxiety to life-stress and achievement in students. *British Journal of Psychology, 95*, 509-521. doi: <https://doi.org/10.1348/0007126042369802>
- Beintner, I., Jacobi, C., & Taylor, C. B. (2012). Effects of an Internet-based prevention programme for eating disorders in the USA and Germany: A meta-analytic review. *European Eating Disorders Review: The Journal of the Eating Disorders Association, 20*(1), 1-8. doi: 10.1002/erv.1130
- Bewick, B., Koutsopoulou, G., Miles, J., Slaa, E., & Barkham, M. (2010). Changes in undergraduate students' psychological well-being as they progress through university. *Studies in Higher Education, 35*(6), 633-645. doi: 10.1080/03075070903216643
- Biglan, A., Hayes, S. C., & Pistorello, J. (2008). Acceptance and commitment: Implications for prevention science. *Prevention Science, 9*(3), 139-152. doi: 10.1007/s11121-008-0099-4
- Blackledge, J. T., Ciarrochi, J., & Bailey, A. (n.d.). *Personal Values Questionnaire II*. Retrieved from [https://contextualscience.org/personal\\_values\\_questionnaire](https://contextualscience.org/personal_values_questionnaire). Accessed 19 August 2015.
- Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S. M., & Olfson, M. (2008). Mental health of college students and their non-college-attending peers: Results from the National Epidemiologic Study on Alcohol and Related Conditions. *Archives of General Psychiatry, 65*(12), 1429-1437. doi: 10.1001/archpsyc.65.12.1429

- Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., . . . Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, *42*, 676-688. doi: 10.1016/j.beth.2011.03.007
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101. doi: 10.1191/1478088706qp063oa
- Brooke, J. (1996). *SUS - A quick and dirty usability scale*. Retrieved from <https://www.usability.gov/how-to-and-tools/methods/system-usability-scale.html>. Accessed 13 August 2015.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*(4), 822-848. doi: 10.1037/0022-3514.84.4.822
- Chase, J. A., Housmanfar, R., Hayes, S. C., Ward, T. A., Vilardaga, J. P., & Follette, V. (2013). Values are not just goals: Online ACT-based values training adds to goal setting in improving undergraduate college student performance. *Journal of Contextual Behavioral Science*, *2*(3-4), 79-84. doi: 10.1016/j.jcbs.2013.08.002
- Christensen, H., Griffiths, K. M., & Jorm, A. F. (2004). Delivering interventions for depression by using the internet: Randomised controlled trial. *BMJ*, *328*(7434), 265. doi: 10.1136/bmj.37945.566632.EE
- Cotton Bronk, K., Hill, P. L., Lapsley, D. K., Talib, T. L., & Finch, H. (2009). Purpose, hope, and life satisfaction in three age groups. *The Journal of Positive Psychology*, *4*(6), 500-510. doi: 10.1080/17439760903271439

- Craske, M. G. (2012). Transdiagnostic treatment for anxiety and depression. *Depression and Anxiety, 29*(9), 749-753. doi: 10.1002/da.21992
- Croom, K., Staiano-Coico, L., Lesser, M. L., Lewis, D. K., Reyna, V. F., Marchell, T. C., . . . Ives, S. (2015). The glass is half full: Evidence for efficacy of alcohol-wise at one university but not the other. *Journal of Health Communication, 20*(6), 627-638. doi: 10.1080/10810730.2015.1012239
- Cuijpers, P., van Straten, A., & Andersson, G. (2008). Internet-administered cognitive behavior therapy for health problems: A systematic review. *Journal of Behavior Medicine, 31*(2), 169-177. doi: 10.1007/s10865-007-9144-1
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*(1), 71-75. doi: 10.1207/s15327752jpa4901\_13
- Eisenberg, D., Golberstein, E., & Gollust, S. E. (2007). Help-seeking and access to mental health care in a university student population. *Medical Care, 45*(7), 594-601. doi: <https://doi.org/10.1097/mlr.0b013e31803bb4c1>
- Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry, 77*(4), 534-542. doi: 10.1037/0002-9432.77.4.534
- Eustis, E. H., Hayes-Skelton, S. A., Orsillo, S. M., & Roemer, L. (2018). Surviving and Thriving During Stress: A Randomized Clinical Trial Comparing a Brief Web-Based Therapist-Assisted Acceptance-Based Behavioral Intervention Versus Waitlist Control for College Students. *Behavior Therapy*. doi: 10.1016/j.beth.2018.05.009

- Farrand, P., & Woodford, J. (2013). Impact of support on the effectiveness of written cognitive behavioural self-help: A systematic review and meta-analysis of randomised controlled trials. *Clinical Psychology Review*, 33(1), 182-195. doi: 10.1016/j.cpr.2012.11.001
- French, K., Golijani-Moghaddam, N., & Schröder, T. (2017). What is the evidence for the efficacy of self-help acceptance and commitment therapy? A systematic review and meta-analysis. *Journal of Contextual Behavioral Science*, 6(4), 360-374. doi: 10.1016/j.jcbs.2017.08.002
- Gaetano, J. (2019). Welch's t-test for comparing two independent groups: An Excel calculator (1.0.1). <https://ideospectus.com/2018/10/22/welchs-t-test-calculator-v-1-0/>.
- Gallagher, R. P. (2012). Thirty Years of the National Survey of Counseling Center Directors: A Personal Account. *Journal of College Student Psychotherapy*, 26(3), 172-184. doi: 10.1080/87568225.2012.685852
- Gallagher, R. P. (2014). *National survey of college counseling centers 2013. Section one: 4-year directors*. Pittsburgh, PA: University of Pittsburgh.
- Gillanders, D. T., Bolderston, H., Bond, F. W., Dempster, M., Flaxman, P. E., Campbell, L., . . . Remington, B. (2014). The development and initial validation of the Cognitive Fusion Questionnaire. *Behaviour Therapy*, 45, 83-101. doi: 10.1016/j.beth.2013.09.001
- Hayes, S. C., Pistorello, J., & Levin, M. E. (2012). Acceptance and Commitment Therapy as a Unified Model of Behavior Change. *The Counseling Psychologist*, 40(7), 976-1002. doi: 10.1177/0011000012460836



- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2011). *Acceptance and Commitment Therapy. An experiential approach to behavior change* (2nd ed.). New York, NY: The Guildford Press.
- Jacobson, N. S., & Truax, P. (1991). Clinical Significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, *59*(1), 12-19. doi: 10.1037/0022-006X.59.1.12
- Keyes, L. M. (2009). *Brief description of the mental health continuum short form (MHC-SF)*. Retrieved from <http://www.sociology.emory.edu/ckeyes/>. Accessed 14 August 2015.
- Kim, J. E., Saw, A., & Zane, N. (2015). The influence of psychological symptoms on mental health literacy of college students. *American Journal of Orthopsychiatry*, *85*(6), 620-630. doi: 10.1037/ort0000074
- Lappalainen, P., Granlund, A., Siltanen, S., Ahonen, S., Vitikainen, M., Tolvanen, A., & Lappalainen, R. (2014). ACT Internet-based vs face-to-face? A randomized controlled trial of two ways to deliver Acceptance and Commitment Therapy for depressive symptoms: An 18-month follow-up. *Behaviour Research and Therapy*, *61*, 43-54. doi: 10.1016/j.brat.2014.07.006
- Levin, M. E., Haeger, J. A., Pierce, B. G., & Twohig, M. P. (2016). Web-based Acceptance and Commitment Therapy for mental health problems in college students: A randomized controlled trial. *Behavior Modification*, *41*(1), 141-162. doi: 10.1177/0145445516659645
- Levin, M. E., Hayes, S. C., Pistorello, J., & Seeley, J. R. (2016). Web-based self-help for preventing mental health problems in universities: Comparing Acceptance and Commitment Training to mental health education. *Journal Clinical Psychology*, *72*(3), 207-225. doi: 10.1002/jclp.22254

- Levin, M. E., Pistorello, J., Hayes, S. C., Seeley, J. R., & Levin, C. (2015). Feasibility of an Acceptance and Commitment Therapy adjunctive web-based program for counseling centers. *Journal of Counseling Psychology, 62*(3), 529-536. doi: 10.1037/cou0000083
- Levin, M. E., Pistorello, J., Seeley, J. R., & Hayes, S. C. (2014). Feasibility of a prototype web-based Acceptance and Commitment Therapy prevention program for college students. *Journal of American College Health, 62*(1), 20-30. doi: 10.1080/07448481.2013.843533
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behavior Research and Therapy, 33*(3), 335-343. doi: 10.1016/0005-7967(94)00075-U
- McCracken, L. M., DaSilva, P., Skillicorn, B., & Doherty, R. (2014). The Cognitive Fusion Questionnaire: A preliminary study of psychometric properties and prediction of functioning in chronic pain. *Clinical Journal of Pain, 30*(10), 894-901. doi: 10.1097/AJP.0000000000000047
- Moher, D., Hopewell, S., Schulz, K. F., Montori, V., Gotzsche, P. C., Devereaux, P. J., . . . Consolidated Standards of Reporting Trials, G. (2010). CONSORT 2010 Explanation and elaboration: Updated guidelines for reporting parallel group randomised trials. *Journal of Clinical Epidemiology, 63*(8), e1-37. doi: 10.1016/j.jclinepi.2010.03.004
- Montoya, A. K., & Hayes, A. F. (2016). Two-condition within-participant statistical mediation analysis: A path-analytic framework. *Psychological Methods*. doi: 10.1037/met0000086

- Muto, T., Hayes, S. C., & Jeffcoat, T. (2011). The effectiveness of Acceptance and Commitment Therapy bibliotherapy for enhancing the psychological health of Japanese college students living abroad. *Behavior Therapy*, *42*(2), 323-335. doi: 10.1016/j.beth.2010.08.009
- Neff, K. D., Hsieh, Y.-P., & Dejjitrat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity*, *4*(3), 263-287. doi: 10.1080/13576500444000317
- Pakenham, K. I. (2015). Training in Acceptance and Commitment Therapy fosters self-care in clinical psychology trainees. *Clinical Psychologist*, 1-9. doi: 10.1111/cp.12062
- Paliliunas, D., Belisle, J., & Dixon, M. R. (2018). A randomized control trial to evaluate the use of Acceptance and Commitment Therapy (ACT) to increase academic performance and psychological flexibility in graduate students. *Behavior Analysis in Practice*. doi: 10.1007/s40617-018-0252-x
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717-731. doi: 10.3758/BF03206553
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy*, *18*, 250-255. doi: 10.1002/cpp.702
- Rasanen, P., Lappalainen, P., Muotka, J., Tolvanen, A., & Lappalainen, R. (2016). An online guided ACT intervention for enhancing the psychological wellbeing of university students: A randomised controlled trial. *Behavior Research and Therapy*, *78*(2016), 30-42. doi: 0.1016/j.brat.2016.01.001

- Regehr, C., Glancy, D., & Pitts, A. (2013). Interventions to reduce stress in university students: A review and meta-analysis. *Journal of Affective Disorders, 148*(1), 1-11. doi: 10.1016/j.jad.2012.11.026
- Reinwand, D. A., Crutzen, R., Elfeddali, I., Schneider, F., Schulz, D. N., Smit, E. S., . . . de Vries, H. (2015). Impact of educational level on study attrition and evaluation of web-based computer-tailored interventions: Results from seven randomized controlled trials. *Journal of Medical Internet Research, 17*(10), 1-16. doi: 10.2196/jmir.4941
- Richards, D., & Richardson, T. (2012). Computer-based psychological treatments for depression: A systematic review and meta-analysis. *Clinical Psychology Review, 32*(4), 329-342. doi: 10.1016/j.cpr.2012.02.004
- Rickwood, D., Deane, F. P., Wilson, C. J., & Ciarrochi, J. (2005). Young people's help-seeking for mental health problems. *Australian e-Journal for the Advancement of Mental Health, 4*(3 Suppl), 1-34. doi: <https://doi.org/10.5172/jamh.4.3.218>
- Rubin, D. B. (1996). Multiple imputation after 18+ years. *Journal of the American Statistical Association, 91*(434), 473-489. doi: <https://doi.org/10.2307/2291635>
- Ruiz, F. J. (2012). Acceptance and Commitment Therapy versus traditional Cognitive Behavioral Therapy: A systematic review and meta-analysis of current empirical evidence. *International Journal of Psychology and Psychological Therapy., 12*(2), 333-357. Retrieved from <https://www.ijpsy.com/volumen312/num333/334.html>.
- Ryan, M. L., Shochet, I. M., & Stallman, H. M. (2010). Universal online interventions might engage psychologically distressed university students who are unlikely

to seek formal help. *Advances in Mental Health*, 9(1), 73-83. doi:  
10.5172/jamh.9.1.73

Sauro, J. (2011). *Measuring Usability with the System Usability Scale (SUS)*.

Retrieved from <https://measuringu.com/sus/d>. Accessed 25 January, 2017.

Scheffer, J. (2002). Dealing with missing data. *Research Letters in the Information and Mathematical Science*, 3, 153-160. Retrieved from [www.scirp.org](http://www.scirp.org).

Stafford-Brown, J., & Pakenham, K. I. (2012). The effectiveness of an ACT informed intervention for managing stress and improving therapist qualities in clinical psychology trainees. *Journal of Clinical Psychology*, 68(6), 592-613. doi:  
10.1002/jclp.21844

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist*, 45(4), 249-257. doi:  
10.1080/00050067.2010.482109

Stallman, H. M. (2012). University counselling services in Australia and New Zealand: Activities, changes, and challenges. *Australian Psychologist*, 47(4), 249-253. doi: 10.1111/j.1742-9544.2011.00023.x

Stallman, H. M., & Kavanagh, D. J. (2016). Development of an internet intervention to promote wellbeing in college students. *Australian Psychologist*. doi:  
10.1111/ap.12246

Stallman, H. M., & Shochet, I. A. N. (2009). Prevalence of mental health problems in Australian university health services. *Australian Psychologist*, 44(2), 122-127. doi: 10.1080/00050060902733727

Trompetter, H. R., Bohlmeijer, E. T., Veehof, M. M., & Schreurs, K. M. (2015). Internet-based guided self-help intervention for chronic pain based on

Acceptance and Commitment Therapy: A randomized controlled trial. *Journal of Behavioral Medicine*, 38(1), 66-80. doi: 10.1007/s10865-014-9579-0

Trompetter, H. R., ten Klooster, P. M., Schreurs, M. G., Fledderus, M., Westerhof, G. J., & Bohlmeijer, E. T. (2013). Measuring values and committed action with the Engaged Living Scale (ELS): Psychometric evaluation in a nonclinical sample and a chronic pain sample. *Psychological Assessment*, 25(4), 1235-1246. doi: 10.1037/a0033813

Vaez, M., & Laflamme, L. (2008). Experienced stress, psychological symptoms, self-rated health and academic achievement: A longitudinal study of Swedish university students. *Social Behavior and Personality*, 36(2), 183-196. doi: 10.2224/sbp.2008.36.2.183

Viskovich, S., & Pakenham, K. I. (2018). Pilot evaluation of a web-based Acceptance and Commitment Therapy program to promote mental health skills in university students. *Journal of Clinical Psychology*, 74(12), 2047-2069. doi: 10.1002/jclp.22656

**Figure**

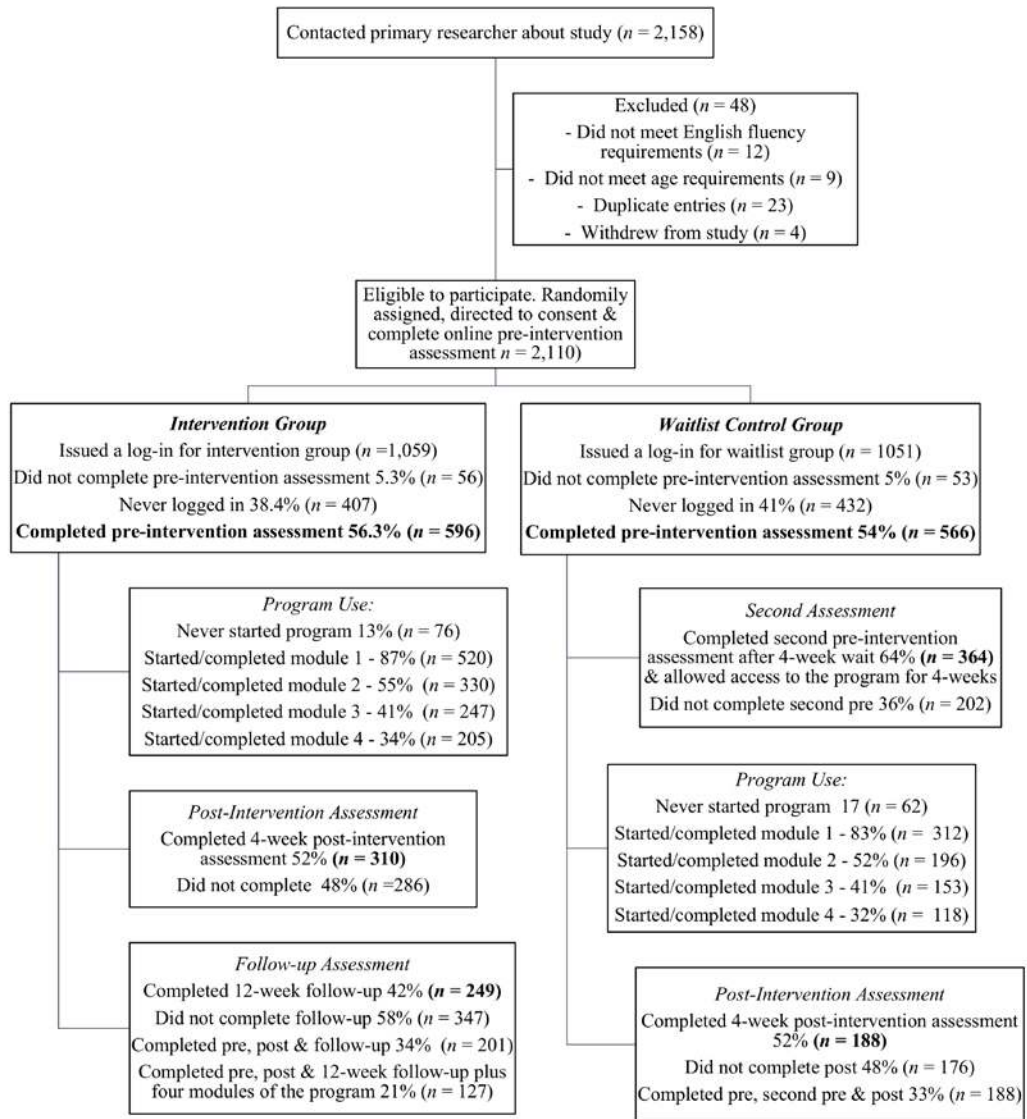


Figure 1. CONSORT diagram for flow of participants. Bold indicates sample sizes at each assessment point for each treatment arm. Figures for Program Use report percentage of participants who completed each module, therefore, they do not sum to 100%. Percentages listed in Assessment boxes use  $n = 596$  (treatment) and  $n = 566$  (waitlist) for calculation.

Table 1 *Blinded Program Content*

Module	Content
Module 1: Values and Committed Action	Definition of values introductory video, values video, values exercises (e.g., contemplating what is important in your life, 80-year old birthday speech, values drop), committed action
Module 2: Cognitive Fusion	exercise (e.g., SMART goal training), troubleshooting video,
Module 3: Acceptance	experiential avoidance video.
Module 4: Mindfulness and the Observer Self	<p><i>Content reflection prompt (at completion of Exercise 2):</i> choose a value you identified in this exercise that you wish to start expressing in your life, identify the ‘why’ behind this value and find one small action to express it.</p> <p>Thought evolution introductory video, defusion exercise (e.g., leaves on a stream), defusion task (e.g., what thoughts hook you), defusing from thoughts video, defusion video, defusion exercise (e.g., hands as thoughts).</p> <p><i>Content reflection prompt (at completion of Exercise 3) –</i> reminder to listen to what your mind is saying, create distance and use the “I notice I’m having the thought” strategy.</p> <p>Definition of acceptance, willingness video, metaphor (e.g., passengers on the bus) and related task, acceptance exercise (e.g., struggle switch), metaphors (e.g., unwanted party guest), acceptance exercise (e.g., costs of avoidance and SPACE).</p> <p><i>Content reflection prompt (at completion of Exercise 1) –</i> quicksand metaphor.</p> <p>Mindfulness definition, formal and informal mindfulness task, video on presence, tasks (e.g., practicing mindfulness), metaphor (e.g., classroom metaphor), observing self-video, observer self exercise (e.g., relaxation observation exercise).</p> <p><i>Content reflection prompt (at completion of Exercise 1) –</i> do one activity mindfully today.</p>



Table 2 Cronbach Alpha's for the RCT Intervention and Waitlist Control Group for Each Primary Outcome and ACT Process Measure Across All Time Measurement Points

Outcome	Total Sample	Intervention Group			Waitlist Control Group	
		Pre	Post	FU	Pre	Post
<b>Primary Outcome Measures</b>						
Depression	.90	.89	.89	.89	.90	.91
Anxiety	.79	.79	.82	.75	.79	.81
Stress	.83	.83	.87	.84	.83	.86
Well-Being	.93	.93	.94	.95	.93	.95
Self-Compassion	.86	.86	.89	.90	.87	.89
Life Satisfaction	.89	.88	.91	.90	.90	.91
Academic Performance	.93	.92	.94	.90	.93	.90
<b>ACT Process Measures</b>						
Acceptance	.91	.91	.92	.92	.91	.93
Cognitive Fusion	.94	.94	.95	.95	.94	.95
Valued Living	.92	.92	.94	.93	.93	.93
Present Moment Awareness	.88	.88	.92	.91	.89	.92

Note. Total sample  $N = 1,162$ . Intervention group sample pre  $n = 596$ , post  $n = 309$ , follow-up  $n = 249$ . Waitlist group pre  $n = 566$ , post  $n = 364$ .

Table 3 Means, Standard Deviations, ANOVA  $F$  Statistics and Cohen's  $d$  Effect Size for Primary Outcomes and ACT Processes as a Function of Group by Time for Intention-to-Treat (ITT) Sample, and Per Protocol (PP) Sample

	Control group				Intervention group						ANOVA statistics		
	Pre		Post		Pre		Post		Follow-up		$F$	$d$	$CI_s$
	$M$	$SD$	$M$	$SD$	$M$	$SD$	$M$	$SD$	$M$	$SD$			
<b>ITT Sample</b>													
<b>Primary Outcomes</b>													
Depression	11.97	9.00	12.20	7.39	11.59	8.46	9.79	5.66	10.09	5.13	20.05***	-.37†	-.48, -.25

Anxiety	9.5 1	7.1 2	9.4 9	5.8 1	9.1 7	6.9 9	8.4 0	4. 94	7.5 4	3. 86	4.26	- .2	-.32, -.09
Stress	15. 92	7.7 1	15. 67	6.4 5	15. 69	7.8 1	13. 48	5. 80	13. 29	4. 76	22.2 8****	- .3	-.47, -.24
Well-Being <sub>1</sub>	2.8 7	0.9 7	2.7 9	0.8 6	2.9 3	0.9 7	3.0 8	0. 69	3.1 0	0. 66	24.2 0****	.3 7†	.26, .49
Self-Compassion	2.8 3	0.7 2	2.8 3	0.6 1	2.8 5	0.7 1	3.0 9	0. 53	3.0 8	0. 48	50.0 3****	.4 7†	.58, .44
Drinks per week	8.8 2	1.9 8	8.9 0	1.5 3	8.8 0	1.8 9	8.9 5	1. 32	9.1 0	1. 01	0.61	-	-
Life Satisfaction	20. 99	7.3 5	21. 05	6.3 3	21. 35	7.1 9	23. 19	5. 12	22. 76	4. 68	26.1 7****	.3 7†	.26, .49
University performance	5.8 6	1.9 6	5.8 0	1.6 4	6.0 4	1.8 9	6.4 8	1. 33	6.2 6	1. 28	21.7 3****	.4 5†	.34, .58
<i>ACT Processes</i>													
Acceptance	25. 68	9.2 8	25. 58	7.6 3	25. 38	9.4 4	23. 56	6. 27	23. 39	5. 55	14.5 0****	- .2	-.40, -.17
Cognitive Fusion	28. 74	9.7 4	28. 25	7.6 4	29. 09	9.4 6	26. 28	6. 55	26. 06	5. 95	24.3 7****	- .2	-.39, -.16
Education Values:	3.8 6	0.5 7	3.8 0	0.4 4	3.8 8	0.5 5	3.9 0	0. 43	3.9 3	0. 36	5.41	.2 4†	.12, .35
Success <sub>1</sub> Ratio	0.7 1	0.3 5	0.7 5	0.2 6	0.6 8	0.3 2	0.6 5	0. 24	0.6 4	0. 19	12.8 6****	- .4	-.53, -.30
Valued Living Present Moment	54. 47	12. 05	54. 30	9.6 4	55. 16	11. 75	57. 36	8. 22	57. 85	7. 63	19.1 6****	.3 4†	.23, .46
	3.5 9	0.8 2	3.5 8	0.7 1	3.5 9	0.7 9	3.7 6	0. 63	3.7 9	0. 55	21.8 9****	.2 7†	.16, .39
Awareness													

	Control group				Intervention group						ANOVA statistics		
	Pre		Post		Pre		Post		Follow-up				
	<i>M</i>	<i>S</i> <i>D</i>	<i>M</i>	<i>S</i> <i>D</i>	<i>M</i>	<i>S</i> <i>D</i>	<i>M</i>	<i>S</i> <i>D</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>d</i>	<i>CIs</i>
<b>PP Sample</b>													
<i>Primary Outcomes</i>													
Depression	11.82	8.90	12.00	9.12	11.2	8.11	8.10	6.90	7.87	6.78	26.09***	-.45	-.66, .25
Anxiety	9.41	7.43	9.12	7.16	8.62	5.86	6.40	4.83	5.38	4.90	13.44***	-.41	-.61, .21
Stress	15.84	7.92	15.58	7.97	15.5	7.72	12.10	7.9	11.7	6.77	22.94***	-.44	-.64, .23
Well-Being	2.84	0.99	2.79	1.05	3.02	0.96	3.18	0.92	3.29	1.03	12.94***	.39	.18, .59
Self-Compassion	2.82	0.73	2.83	0.74	2.87	0.72	3.17	0.71	3.20	0.74	42.40***	.47	.26, .67
Drinks per week	8.85	1.88	8.94	1.86	8.97	1.67	9.14	1.73	9.15	1.36	0.45	-	-
Life Satisfaction	20.85	7.47	21.01	7.90	21.7	7.46	23.3	7.59	23.4	7.63	9.81*	.30	.10, .51
University performance	5.88	1.97	5.91	2.04	6.02	1.81	6.94	1.67	6.85	1.86	31.28***	.58	.32, .73
<b>ACT Processes</b>													
Acceptance	25.70	9.31	25.63	9.47	24.72	9.60	22.55	8.25	21.82	8.86	11.87***	-.32	-.53, .12
Cognitive Fusion	28.57	9.44	28.27	9.44	28.4	9.71	25.23	8.55	24.01	8.97	19.36***	-.33	-.53, .13
Education Values:	3.8	0.3	3.0	0.3	3.0	0.3	3.0	0.3	4.0	0.5	7.34*	.3	.12,

Success	8	5	81	54	90	56	99	52	01	7	*	2	.53
		5										†	
Ratio	0.7	0.	0.	0.	0.	0.	0.	0.	0.	0.2	4.67	-	-
	1	3	75	32	63	31	61	32	61	8		.4	.65,
		3										4	-.24
												†	
Valued Living	54.	1	54	12	55	11	58	11	60	11.	20.03	.3	.17,
	06	1.	.3	.0	.3	.3	.7	.1	.4	52	***	8	.58
		8	0	0	9	1	3	6	1			†	
		7											
Present Moment Awareness	3.6	0.	3.	0.	3.	0.	3.	0.	3.	0.9	34.90	.3	.13,
	1	8	57	88	58	82	87	85	93	0	***	4	.54
		3										†	

Note. ITT Sample  $n = 1,162$ . PP Sample  $n = 491$ . CI = 95% confidence intervals of effect size. Higher scores on acceptance indicate lower acceptance. ANOVA statistics refer to between-groups repeated measures analysis of pre- to post-intervention scores.

\*\*  $p < .01$ , \*\*\*  $p < .001$ .

Effect sizes † = small, †† = medium.

1 Variances were not equal between groups. However, Welch's t test between groups were significant: well-being ( $t = 3.58, p = .001$ ) and education values success ( $t = 4.57, p = .000$ )

Table 4 Significant Indirect Effects of the Intervention on Outcomes through changes in ACT Processes

	Point estimate	95% BCa Confidence Interval	
		Lower	Upper
<b>Intention-to-Treat Sample</b>			
Depression	-.5882	-.8635	-.3509
Acceptance	-.4213	-.6778	-.2128
Cognitive fusion	-.5200	-.7721	-.3125
Valued living	.0544	-.0678	.1754
Present moment awareness	-.0320	-.1209	.0408
Education values ratio			
<b>Anxiety</b>			
Acceptance	-.7206	-.9975	-.4619
Cognitive fusion	-.7629	-1.0389	-.5010
Valued living	-.3920	-.5965	-.2124
Present moment awareness	-.3359	-.5195	-.1917
Education values ratio	-.1913	-.3505	-.0617
<b>Stress</b>			
Acceptance	-.9365	-1.2686	-.6093
Cognitive fusion	-1.0922	-1.4697	-.7247
Valued living	-.5211	-.7536	-.3143
Present moment awareness	-.5739	-.8281	-.3528

<i>Well-being</i>			
Acceptance	.1066	.0687	.1471
Cognitive fusion	.1054	.0697	.1436
Valued living	.1314	.0902	.1743
Present moment awareness	.0212	.0097	.0351
Education values success	.0110	.0021	.0229
<i>Self-Compassion</i>			
Acceptance	.0986	.0646	.1336
Cognitive fusion	.1036	.0702	.1393
Valued living	.0766	.0527	.1012
Present moment awareness	.0441	.0264	.0638
Education values ratio	.0188	.0059	.0341
<i>Life Satisfaction</i>			
Acceptance	.7136	.4508	.9821
Cognitive fusion	.6672	.4405	.9153
Valued living	1.0973	.7631	1.4523
Present moment awareness	.1121	.0105	.2250
<i>Academic performance</i>			
Acceptance	.1447	.0910	.2040
Acceptance	.1537	.1001	.2128
Cognitive fusion	.1616	.1045	.2279
Valued living	.0685	.0320	.1124
Present moment awareness	.0585	.0249	.0999
Education values success			
<hr/>			
<b><i>Per Protocol Sample</i></b>			
<i>Depression</i>			
Acceptance	-.9505	-1.4965	-.4700
Acceptance	-1.1606	-1.8007	-.6065
Cognitive fusion	-.8206	-1.3042	-.4223
Valued living	-.6042	-1.0241	-.2688
Present moment awareness			
<i>Anxiety</i>			
Acceptance	-.5151	-.8644	-.2300
Cognitive fusion	-.6601	-1.0523	-.3276
Valued living	-.4128	-.7701	-.1408
Present moment awareness	-.4085	-.7378	-.1463
<i>Stress</i>			
Acceptance	-.8766	-1.3892	-.4476
Cognitive fusion	-1.3176	-1.9611	-.7294
Valued living	-.5765	-.9905	-.2365
Present moment awareness	-.9988	-1.5220	-.5542
<i>Well-being</i>			
Acceptance	.0701	.0280	.1208
Cognitive fusion	.0844	.0404	.1374
Valued living	.1084	.0619	.1638
Present moment awareness	.0343	.0047	.0682

Education values success	.0247	.0049	.0513
<i>Self-Compassion</i>			
Acceptance	.0867	.0427	.1330
Cognitive fusion	.0990	.0523	.1515
Valued living	.0715	.0420	.1060
Present moment awareness	.0636	.0316	.1043
Education values ratio	.0175	.0024	.0385
<i>Life Satisfaction</i>			
Acceptance	.4279	.1761	.7519
Cognitive fusion	.491	.2026	.8040
Valued living	.8800	.4569	1.3968
Present moment awareness	.0378	-.2230	.3133
<i>Academic performance</i>			
Acceptance	.1054	.0371	.1948
Cognitive fusion	.1744	.0854	.2850
Valued living	.1436	.0577	.2624
Present moment awareness	.1187	.0441	.2133
Education values success	.0815	.0239	.1583

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*Note.* BCa = Bias corrected and accelerated. Based on 5,000 bootstrapped samples. Intention-to-Treat sample  $n = 1,162$ . Per Protocol sample  $n = 491$ .