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**ACT and CBT: A Comparison of Predictors for Depression and Anxiety**

Madeline Yorke

Western Michigan University

Honors Thesis

Dr. Scott Gaynor

## **Introduction**

Depression and anxiety are among the most commonly diagnosed mental health issues in the United States and across the world. In the past decade, an increasing amount of attention on these conditions has surfaced regarding rising diagnoses and greater concern for treatment. In 2022, the National Health Statistics Report published a study that stated an estimated 4.1% of adults are considered to have high levels of anxiety. The estimated prevalence of depression in the United States was 7.1% in 2018 (Greenberg et al., 2021). Comparatively, the lifetime prevalence for Generalized Anxiety Disorder (GAD) is found to range from 4-7% (Kessler, 2000) and is 16% for depression (Kessler et al., 2003). While both disorders have the ability to cause significant impairment on their own, they are often comorbid. One study completed by Lamers et al. in 2011 showed lifetime estimates of anxiety and depression comorbidity to be as high as 81%.

Increasing prevalence of depression and anxiety has led to a greater need for treatment options across the United States. Two common models that are known to be effective treatments for anxiety and depression are Cognitive Behavioral Therapy (CBT) and Acceptance and Commitment Therapy (ACT). Historically, CBT and ACT have been compared innumerable times and are often considered to be competing therapies. Although these treatments operate using different principles, they are both supported with substantial research showing effectiveness in their methods.

Acceptance and Commitment Therapy focuses on psychological flexibility as its core construct. Psychological flexibility is the ability of a person to respond functionally to a stimulus or event. This response should be appropriate for the context of the stimulus and congruent with that person's values (Masuda and Tully, 2012). Psychological flexibility involves being

immersed in the present moment, acknowledging all feelings and emotions, and developing a behavioral repertoire that moves the person further towards their values and goals. The construct involves six core subconstructs that synergistically interact one another (Masuda and Tully, 2012). These six variables include “contact with the present moment”, “values”, “committed action”, “self-as-context”, “defusion”, and “acceptance”. While each variable is an important aspect of psychological flexibility, focus during this study will be on “values”, “committed action”, and “defusion.”

“Values” as a core piece of psychological flexibility refers to a person’s desired qualities that lead their actions. Values is a descriptive term used to denote how a person chooses to lead their life and act with purpose. Examples of values may include generosity, honesty, or empathy, among many other options. Once these values are selected, they should be used as a checkpoint to ensure that each action a person takes fits within what is important to them. Someone who lives without strong values often will experience a lack of direction, which leads to impulsive, and often meaningless, decision making. According to the ACT model, having a clear vision of values is critical to living a meaningful life. These values act as a compass that guides action and assists in making important decisions (Twohig, 2012).

Going hand in hand with “values” is “committed action.” While someone can choose to live with strong values, committed action is required in order to follow through with exercising a purposeful life (Twohig, 2012). To express committed action, a person should embody their values in daily life, even when it may cause negative emotions, is inconvenient, or causes discomfort. Actions could include something as simple as making the bed every morning. Committed action can be crucial in recovering from mental illnesses, as it leads the person to

take actions to improve their health and wellbeing. In combination, commitment to values is essential to feeling fulfilled throughout a person's lifetime.

Third, the study will be evaluating defusion as a variable in psychological flexibility. Humans have a tendency to "fuse" thoughts together and create a relationship between themselves and that thought. Most of the time, this process is done without realization. Fusing certain words or symbols with thoughts can lead to self-targeting and negative feelings. A person who struggles to defuse is at risk of having a substantially lower self-image than someone who does not (Twohig, 2012). For example, say that two students fail an exam. The student who is highly fused with their thoughts may say a statement like "I am a failure" and believe it is representative of true reality with some conviction, whereas the student with strong defusion skills may say "I failed that exam, but I am not a failure," recognizing the statement is not necessarily reflective of the truth. In the first statement, the outcome of a failed exam was fused with the student, therefore creating an association in the mind between failing and the actual person. The student with strong defusion was able to differentiate between an unfortunate or negative event and themselves as a whole. Defusion provides the ability to create distance between actions and thoughts, and bring awareness to self-destructing notions (Twohig, 2012).

Many studies have been published establishing the relationships between variables in psychological flexibility and mental health. Research has shown that subjects who score well in values, committed action, and defusion are often more psychologically flexible. Research has demonstrated that psychological inflexibility has a strong correlation to mental health issues. Those who are less flexible have a weaker ability to separate themselves from negative situations and continue to persevere through undesirable events. When repeated negative events occur, a

person who is inflexible is unable to overcome or outlast the circumstances and have increased chances of developing anxiety or depression.

Cognitive Behavioral Therapy (CBT) is the second therapy that is being compared in this study. A primary construct of CBT involves the role of distorted or harmful patterns of cognition (Spinhoven et al., 2018). Two notable forms of maladaptive cognitive patterns are repetitive negative thoughts (RNT) and worry. While worry is not a core feature of CBT, it is highly consistent with the construct, and its conceptualization emerges from the CBT model. In its general form, CBT emphasizes the bidirectional relationships between thoughts, feelings, and behavior, captured in the cognitive-behavioral triad.

Borkovec's model of Generalized Anxiety Disorder (GAD) has been a longstanding theory used in behavioral psychology to explain worry. Borkovec suggests that worry is a method of cognitive avoidance as a response to a perceived future threat (Borkovec, 1994). A major area of concern that contributes to the continuation of mood and anxiety symptoms is repetitive negative thinking (RNT). RNT is a transdiagnostic process that features repetitive negative thoughts oriented towards events or experiences that seem uncontrollable and abstract, as opposed to concrete and predominately verbal in nature (Ehrig & Watkins, 2008). In previous studies, RNT is found to have a significant role in the maintenance of emotional disorders (Ehrig & Watkins, 2008). RNT often manifests similarly to a cycle, where recurrent focus on negative thought content prolongs negative mood, and in turn predisposes further engagement in RNT.

Two sub-constructs, worry and rumination, are identified as predominant features of RNT. Rumination is not evaluated in this study. Worry is defined as the process of engaging in RNT about uncertain and undesirable future outcomes (Borkovec, 1994). Worry is seen to be as future oriented, where anxiety roots in concern with upcoming events. A commonly accepted

theory is that worry is a cognitive attempt at forming methods for preventing bad events from happening, or preparing for their onset. In this theory, the avoidance response is negatively reinforced because it precludes emotional processing of fear related stimuli, which is necessary for the extinction of anxiety symptoms. This process leads to the continuum of worry.

RNT and worry has been heavily investigated for relationships to mental health. Research has shown a positive correlation between worry and increased amounts of RNTs. Furthermore, those with increased worry scores also commonly have more symptoms of anxiety. Those who consistently endure negative thinking are not able to recover from the worry of upcoming events, therefore inducing anxiety symptoms. It is this process repeated regularly that leads to disorders such as GAD. When repeated events occur that are perceived as stressful, especially with the potential of undesirable outcomes, a person with significant RNT would struggle to overcome the feelings of anxiety and increase their likeliness of developing a chronic disorder (Borkovec, 1994).

The overall purpose of this study is to determine how well ACT variables compared to CBT variables explain the variation in depression and anxiety. At least one ACT process variable will be statistically significant above all competing CBT process variables for predicting overall psychological distress (DASS-Total).

## **Methodology**

### **Participants**

Participants in this study will be students who experience significant worry and are currently enrolled as an undergraduate or graduate candidate at Western Michigan University. Participants must be at least 18 years of age or older. There are no exclusion criteria for this

study. Participant recruitment will involve communication via verbal and e-mail correspondence from various campus organizations and distribution of flyers at on-campus locations. Students may be offered extra credit points for participation in the study at their instructor's discretion. Approximately 300 students will be screened for the study with the goal of a minimum of 30 students completing the study.

### **Design and Variables**

The design of this study will be cross-sectional. There will be process and outcome variables. The predictor variables are psychological and behavioral processes represented in either the CBT or ACT model. The ACT variables include valued living, cognitive defusion, and psychological flexibility. The CBT variables included repetitive negative thoughts (RNT) and worry. The outcome variables will include overall psychological distress and depression. These variables will be measured by scoring on the DASS-Total questionnaire.

### **Demographic Measures**

**Demographics.** A researcher-developed questionnaire will be used to measure the demographics of participants. The participants will be asked to indicate information including their age, sex, gender, race, religion, socioeconomic status (SES), and education level.

**Current Health Services.** A researcher-developed questionnaire will be used to evaluate any current use of healthcare services by the student. This questionnaire will ask participants to indicate if they are currently receiving any psychological treatments from a therapist for mental health problems. They will also be asked to note if they had any medication change within the last eight weeks.



## **Outcome Measures**

**Depression and Anxiety Related Stress.** The Depression Anxiety Stress Scale-21 (DASS-21) was used to measure depression, anxiety, and psychological distress. This measure consists of 21 questions separated into three subscales: Depression, Anxiety, and Stress. A four-point Likert-type scale was used to ask the participants about their distress over the last week. The scale ranges from 1 (Did not apply to me at all) to 4 (Applied to me very much or most of the time). Internal consistency for this measure's subscale ranges from good to excellent ( $\alpha > 0.87$ ). For college undergraduates, the average mean depression score is 4.1 (SD = 4.3), the average mean anxiety score is 3.9 (SD = 3.6), and the average mean stress score is 6.0 (SD = 4.1), with possible scores ranging from 0-21. The average combined mean score is 14.1 (SD = 10.6) with possible scores ranging from 0-63 (Kia-Keating, et al, 2017).

## **Predictor Measures**

**Worry.** The Penn State Worry Questionnaire-16 (PSWQ-16) was used to measure worry. This measure consists of 16 questions. A five-point Likert-type scale was used, ranging from 1 (Not at all typical of me) to 5 (very typical of me). The internal consistency for this measure is excellent ( $\alpha = 0.93$ ). Normative research indicates the PSWQ-16 has a mean of 46.00 and a standard deviation of 12.13 for White-American non-clinical college students. For African-American non-clinical college students had a mean of 42.45 and a standard deviation of 10.64 (Carter, et al., 2005).

**Repetitive Negative Thinking.** The Perseverative Thinking Questionnaire (PTQ) was used to measure repetitive negative thinking. The PTQ measures repetitive thought that is intrusive, difficult to control, perceived as unproductive, and interferes with mental capacity

while being content independent. The measure consists of 15 questions separated into three subscales: the core characteristics of RNT, perceived unproductiveness of repetitive negative thinking, and repetitive negative thinking capturing mental capacity. A five-point Likert-type scale was used to ask participants to rate their frequency of repetitive negative thought. The scale ranges from 0 (never) to 4 (almost always). The PTQ exhibits excellent internal consistency ( $\alpha = 0.94 - 0.95$ ) and subscale internal consistencies that range from adequate to excellent. The core characteristics of RNT has an internal consistency of  $\alpha = 0.92-0.94$ . The unproductiveness of RNT has an internal consistency of  $\alpha = 0.77-0.87$ . Finally, RNT capturing mental capacity has an internal consistency of  $\alpha = 0.82-0.90$ . The mean for the general, non-clinical population is 28.14 with a standard deviation of 12.77.

**Psychological Flexibility.** The Acceptance and Action Questionnaire-II (AAQ-II) was used to measure psychological flexibility. The measure assesses one's ability to connect with present-moment stimuli, including emotions and thoughts, and creating a behavior that acts towards one's chosen values. The measure contains seven items. A seven-point Likert-type scale was used ranging from 1 (never true) to 7 (always true). The AAQ-II exhibits good internal consistency ( $\alpha = 0.88$ ). Normative research indicates that the AAQ-II has a mean score of 28.34 for undergraduate, non-clinical college students at the University of Kentucky (Bond et al., 2011).

Psychological flexibility will also be measured using the Psy-Flex (PF) self-report measure. The PF is a 6-item measure. Items are endorsed on a seven-point Likert-type scale ranging from 7 (very often) to 1 (seldom). This instrument has demonstrated excellent internal consistency ( $\alpha = .90$ ). Normative research indicates that the psy-flex has a mean score of 20.7 for non-clinical college students in the Netherlands (Jongste, 2022).

**Cognitive Fusion.** The Cognitive Fusion Questionnaire (CFQ) was used to measure cognitive fusion. The CFQ contains seven items that measure the degree to which one interprets their thoughts literally and how one's emotions and behaviors are overly influenced by cognition. A seven-point Likert-type scale was used to ask participants to rate the degree to which they experience stress associated with cognitive fusion, from 1 (never true) to 7 (always true). The CFQ has an internal consistency that ranges from good to excellent ( $\alpha = 0.88-0.93$ ). Normative research indicates that the CFQ has a mean of 25.50 for non-clinical college students at the University of Pisa (Donati et al., 2021).

**Valued Living.** The Valuing Questionnaire (VQ) was used to measure valued living. The valuing questionnaire measures the degree to which one lives in accordance with their personally selected values in the past week. The VQ contains 10 items that assess valued living using a seven-point Likert-type scale that ranges from 3 (nearly every day) to 0 (not at all). Both subscales of the VQ, Progress and Obstruction, demonstrate good internal consistency ( $\alpha > 0.79$ ). Normative research indicates that the VQ-Progression has a mean score of 17.2 for non-clinical college students at the University of Adelaide. For the VQ-Obstruction, college students had a mean of 12.1 (Smout et al., 2014).

## **Procedures**

Data was collected via online survey. A web-based survey application, Qualtrics Research Suite, was used for the secure collection and storage of data. Participants were offered an online informed consent document to read and will indicate consent electronically before gaining access to the survey items. After informed consent was obtained, participants were asked to complete nine measures. This took an estimated 35 minutes to complete in total.

The following measures were used: the clinician-developed demographics, clinician-developed current psychological services, DASS-21, PSWQ-16, PTQ, AAQ-II, CFQ, VQ.

## **Data Analysis**

**Descriptive Statistics.** A statistical software program, SPSS, was used to compute descriptive statistics. Demographic information will be analyzed as well as mean, standard deviations, and reliability statistics.

**Bivariate Correlations.** A Pearson's R test was used to assess bivariate correlations. Correlations will be conducted within and between all predictor and outcome variables. A significance level of  $p < .05$  will be used to test for significance.

**Multiple Regression.** Hierarchical multiple regression models will be used to assess the predictive power of the target variables. The predictor variables will be all variables found to have significant correlations with at least one outcome variable as determined by testing with bivariate correlation. The outcome variables will be psychological distress as measured by the DASS-21 Total score. The DASS-21 total score is an aggregate score of overall depressive, anxiety, and stress symptoms, which makes it ideal for targeting commonly experienced symptoms of psychological distress. A significance level of  $p < .05$  will be used to test for significance.

As the purpose of this study is to determine the best predictor for psychological distress, the following procedure will be used. All predictors found to be significant from bivariate correlations will be used in a multiple linear regression model, controlling for gender, race, age, and socioeconomic status. The strongest predictor will be identified as that which meets one of two conditions. The first is the predictor that has the lowest p-value within a model where all

predictors are statistically significant. The second is the predictor that shows significance wherein every other predictor in the model is nonsignificant. It is possible that neither condition is met from this initial model. Thus, a backwards stepwise regression approach will be used. All predictors found to be significant within the initial model will be taken and applied to a new regression model. This process will be repeated until a model is applied by which all predictors in that model are significant. The predictor within this model that has the lowest significant p-value will be identified as the strongest predictor.

To observe the predictive utility of the ACT and CBT models, the two highest variables from the bivariate correlations from each model will also be used in a linear regression for each outcome. The model will be assessed for significance and r-squared values of each model will be compared to determine which has the greater predictive utility. The model that is both statistically significance and has the greater r-squared value will be selected. The significance level is  $p < .05$ . R-squared values can be artificially inflated by using more predictors within a linear regression model. Only the two highest predictive variables will be used to account for this and provide a more balanced comparison.

### **Compensation for Participation**

Students taking classes at WMU may be offered extra credit opportunities for participation at the instructor's discretion.

## Results

Means, standard deviations, and sample proportions were assessed for demographics. The mean age of the sample was 20.21 with a standard deviation of 3.53. By gender, 84.3% of the sample consisted of women, 10.8% were men. All sample statistics on demographics are provided in Table 1.

**Table 1**

*Descriptive Statistics*

Variable	Mean	SD	<i>n</i>	Percentage
Age	20.21	3.53		
Sex				
Male			11	10.8
Female			91	89.2
Gender				
Woman			86	84.3
Man			11	10.8
Nonbinary			2	2.0
Prefer Not to Answer			1	1.0
Other			2	2.0
Ethnicity				
Black/African American			7	6.9
Native American/Native Alaskan			1	1.0
Asian			5	4.9
Hispanic/Latino			6	5.9
Native Hawaiian/Pacific Islander			2	2.0
Caucasian/White			68	66.7
Middle Eastern			4	3.9
Prefer not to answer			3	2.9
Other			6	5.9
Household Income				
Below \$20,000			13	12.7
\$20,000-\$39,999			11	10.8
\$40,000-\$59,999			17	16.7
\$60,000-\$79,999			14	13.7
Above \$80,000			25	24.5
Prefer Not to Answer			22	21.6
Spirituality/Religion				
Atheist			15	14.7
Agnostic			14	13.7

Buddhist	2	2.0
Christian	42	41.2
Hindu	1	1.0
Jewish	3	2.9
Muslim	2	2.0
Other	23	22.6
Education Level		
High school diploma or equivalent	25	24.5
Some college coursework	65	63.7
Associate's degree	9	8.8
Bachelor's degree	2	2.0
Other degree	1	1.0

*Note.* Descriptive statistics involving demographic profiles of participants.

Means and standard deviations were calculated for all predictor and outcome variables. Mean scores approximated the scores expected for this population. The mean for each variable is consistent with previous normative research. Descriptive statistics for these variables are provided in Table 2.

**Table 2.**

*Process and Outcome Descriptive Statistics*

Measure	Mean	Standard Deviation
DASS-21 Total	20.63	13.060
PSWQ-16	59.47	11.460
PTQ	33.18	12.080
AAQ-II	26.63	9.279
PF	20.22	3.934
CFQ	29.33	10.311
VQ Progression	18.37	5.220
VQ Obstruction	15.32	6.322

*Note.* DASS = Depression, Anxiety and Stress Scale-21. PSWQ-16 = Penn State Worry

Questionnaire-16. PTQ = Perseverative Thinking Questionnaire-16. AAQ-II = Acceptance and Action Questionnaire-II. PF = Psy-Flex. CFQ = Cognitive Fusion Questionnaire. VQ = Valuing Questionnaire.

To evaluate significant relationships, Pearson's  $r$  bivariate correlations were conducted within and between all predictor and outcome variables. Nearly all variables were significantly correlated with one another. All correlations and significance levels are provided in the bivariate correlation matrix in Table 3.

**Table 3.**

*Bivariate Correlations*

	1	2	3	4	5	6	7	8
1 PSWQ-16	—							
2 PTQ	.687**	—						
3 PF	-.172	-.390**	—					
4 AAQII	.641**	.728**	-.285**	—				
5 CFQ	.671**	.798**	-.383**	.863**	—			
6 VQ Prog	-.171	-.246**	.224*	-.384**	-.302**	—		
7 VQ Obst	.626**	.745**	-.275**	.792**	.776**	-.281**	—	
8 DASS Total	.533**	.546**	-.263**	.644**	.655**	-.300**	.634**	—

*Note.* Bivariate correlations. Each process variable significantly correlated with at least one outcome variable. \* signifies a  $p$ -value  $< 0.05$ . \*\* signifies a  $p$ -value  $< 0.01$ .

## Multiple Regressions

**Demographics.** Multiple linear regression was used to evaluate any potential relationship between demographics, process, and outcome variables. No significant relationship was found between any demographic and variable measure.

**DASS Total.** Multiple linear regression was used to test if the PSWQ16, PTQ, PF, AAQII, CFQ, VQ Progression, and VQ Obstruction significantly predicted the DASS-Total. The overall regression was statistically significant ( $R^2 = 0.493$ ,  $F(7,94) = 13.062$ ,  $p = < 0.001$ ). It was found that VQ Obstruction significantly predicted the DASS-Total ( $\beta = 0.265$ ,  $p = 0.049$ ). It was found



that the PSWQ16, PTQ, PF, AAQII, CFQ, and VQ Progression did not significantly predict the DASS-Total within this model.

**Table 4**

*ANOVA<sup>a</sup> table for Multiple Linear Regression on DASS Total for CBT and ACT Predictors*

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	8494.776	7	1213.539	13.062	<.001 <sup>b</sup>
Residual	8733.067	94	92.905		
Total	1227.843	101			

*Note.* ANOVA model. **a.** Dependent Variable: DASS\_total. **b.** Predictors: (Constant), VQ\_Obst, PF, VQ\_Prog, PSWQ16, PTQ, AAQII, CFQ

**Table 5.**

*Linear Regression Analysis on DASS-Total for CBT and ACT Predictors*

Coefficients <sup>a</sup>					
Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig
1 (Constant)	-2.591	8.714		-.297	.767
PSWQ16	.169	.124	.148	1.367	.175
PTQ	-.126	.149	-.116	-.840	.403
PF	-.147	.276	-.044	-.530	.597
AAQII	.185	.232	.132	.800	.426
CFQ	.364	.219	.288	1.660	.100
VQ_Prog	-.203	.202	-.081	-1.001	.320
VQ_Obst	.548	.275	.265	1.995	.049

*Note.* Regression Analysis. **a.** Dependent Variable: DASS\_total.

To observe the predictive utility of the ACT and CBT models, the two highest variables from the bivariate correlations were placed into the model and the r-squared values were compared. For the DASS Total score, the two highest correlates from the ACT model were

AAQ-II scores ( $r = 0.644$ ) and CFQ scores ( $r = 0.655$ ). The two highest correlates from the CBT model were PSWQ-16 scores ( $r = 0.533$ ) and PTQ scores ( $r = 0.546$ ). For the ACT model, the overall regression was statistically significant ( $R^2 = 0.454$ ,  $F(2,99) = 41.096$ ,  $p < 0.001$ ). For the CBT model, the overall regression was statistically significant ( $R^2 = 0.346$ ,  $F(2,99) = 26.132$ ,  $p < 0.001$ ). Of the two models, the ACT had the greater r-squared value.

**Table 6.**

*ANOVA<sup>a</sup> table for Multiple Linear Regression on DASS Total for CBT Predictors*

	Model	Sum of Squares	df	Mean Square	F	Sig
1	Regression	5952.507	2	2976.253	26.132	<.001 <sup>b</sup>
	Residual	11275.336	99	113.892		
	Total	17227.843	101			

*Note.* ANOVA model. **a.** Dependent Variable: DASS\_total. **b.** Predictors: (Constant), PSWQ16, PTQ

**Table 7.**

*ANOVA<sup>a</sup> table for Multiple Linear Regression on DASS Total for ACT Predictors*

	Model	Sum of Squares	df	Mean Square	F	Sig
1	Regression	7814.838	2	3907.419	41.096	<.001 <sup>b</sup>
	Residual	9413.005	99	95.081		
	Total	17227.843	101			

*Note.* ANOVA model. **a.** Dependent Variable: DASS\_total. **b.** Predictors: (Constant), AAQII, CFQ

## Discussion

The overall purpose of the study was to evaluate the predictive utility of process variables related to ACT and CBT. Both the ACT and CBT models were found to have significance when predicting the outcome variable, the DASS-21 Total score. Although both were significant, throughout each statistical analysis, ACT variables consistently performed better than CBT variables. In bivariate correlations and multiple linear regression analyses, ACT variables were found to have more consistency with the DASS-Total compared to CBT variables.

A complete analysis of bivariate correlations between the outcome variables and predictor variables was done. Every bivariate correlation performed between process and outcome variables were significant to either the 0.05 or 0.01 level. For the DASS-21, ACT process variables had impressive Pearson's  $r$  values for AAQII (0.644), CFQ (0.655), and VQ-Obstruction (0.634). Comparatively, CBT process variables had lower Pearson's  $r$  values for PSWQ-16 (0.533) and PTQ (0.546).

Based on the results of the bivariate correlations, multiple linear regressions were performed to demonstrate the predictive utility of ACT vs. CBT process variables. In order to give both sets of variables equal circumstances, the top two bivariate correlations were used for both ACT and CBT. These regressions were run independently of each other to analyze the  $r$ -squared value of each regression model. For the DASS-21, the CFQ and AAQII were used for the ACT model that resulted in a  $r$ -squared of 0.454. The CBT model included the PSWQ-16 and PTQ, that showed a  $r$ -squared value of 0.346. As demonstrated by the data, the ACT model had a higher  $r$ -squared value. The methods involved in this statistical analysis allowed the ACT and CBT process variables to be evaluated without potential interference from other variables.

Complete multiple linear regression models were also performed to evaluate how all process variables competed for significance. Every process variable, PSWQ-16, PTQ, AAQII, CFQ, VQ-Obstruction, VQ-Progression, and the PF, were used in each regression. For the DASS-21, VQ-Obstruction was found to significantly predict the model with a p-value of 0.049.

In every model, an ACT process variable had a higher significance compared to the top CBT process variable. While the ACT model may have been demonstrated more consistency, both the ACT and CBT models were found to successfully predict outcome variables. The data presented in the results suggests that the ACT model has an advantage in predictive abilities.

The results found via statistical analysis are consistent with current models in psychological research. The ACT model incorporates six core processes that are theorized to interact synergistically, often represented in a “Hexaflex” diagram that visually demonstrates the influence of each process on the others. The process variables used in the CBT model incorporate only two core processes, worry and RNT. While the worry model focuses on what and how much distress someone has, the ACT model also includes constructs that demonstrate how distress affects their daily lives through committed action and values. The ACT accounted for a greater degree of variance, which suggests that it likely covers a broader range of processes compared to the worry model. Given our results, it is possible that psychological distress can be related to the degree of change in the lifestyle of an individual as opposed to the specific thoughts causing distress, which would need to be confirmed through further research.

### **Limitations and Future Research**

The CBT model often includes cognitive distortions and levels of activation (examples include engagement in tasks that are pleasant, values consistent, or promote mastery of some

activity). This study compared the ACT model to a CBT-adjacent model, the Borkovec worry model. A head-to-head comparison with a more representative CBT model may have different outcomes.

A limitation to the population sample is that only college students were used in the study. It is unknown if the same results would replicate in the general population.

Finally, only a cross-sectional design was used in this study. A stronger study to consider in the future may include measurements taken longitudinally. This would allow the researcher to evaluate if more severe scores in predictor variables at one point predicts more severe scores of outcome variables at a later time.

## **Conclusion**

In conclusion, both the ACT and CBT models showed statistically significant predictive utility for psychological distress. Although both were significant, bivariate correlation and linear regression demonstrated that the ACT model accounted for a greater degree of variance compared to the worry model. Overall, the ACT model appears to offer a stronger paradigm for predicting psychological distress.

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