

AAQ-II Measure of Avoidance Levels Association with Physiological Responses during Self-Critical and Self-Compassionate Writing Tasks

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Introduction:

Heart Rate Variability (HRV) is the variance between consecutive heartbeats in milliseconds. Experiential avoidance can be defined as an attempt to avoid or neglect unpleasant thoughts, feelings, memories, and situations that could potentially cause discomfortability or pain. Past researchers have found a significant difference in HRV during a stressful event for individuals that report higher levels of experiential avoidance and self-ruminative symptoms. This could indicate a parasympathetic withdrawal leading to added stress symptoms. While a relationship between HRV and an individual's avoidance of negative stimuli has already been documented in previous studies, little research has been done on the impact that an individual's level of experiential avoidance could have on HRV during a self-critical and self-compassionate writing task, using the AAQ-II's measure of avoidance. The purpose of this study is to examine whether higher levels of avoidance measured by the Acceptance and Action Questionnaire 2nd Edition (AAQ-II) is correlated with HRV levels during a self-critical and self-compassionate writing exercise.

Methods:

The data were collected from a randomly controlled trial consisting of 84 college students. We collected data via an Electrocardiogram (ECG), a blood pressure monitor, and the AAQ-II questionnaire. Participants completed the AAQ-II prior to a lab visit. The lab visit consisted of the following: 5 minute baseline, 10 minutes of a breathing intervention or nature video, 5 minutes of a self-critical writing exercise, 5 minutes of a self-compassionate writing exercise, and a 10 minute recovery period. We used regression analysis to determine the relationship between the variables.

No significant data to suggest a relationship between HRV during self-compassionate and self-critical writing tasks and higher scores of experiential avoidance reported by the AAQ-II.

Data:

Time	SDNN		Mean HR		LF		HF		LF Log		HF Log		LF/HF Ratio		RMSSD	
	p-val	r ²	p-val	r ²	p-val	r ²	p-val	r ²	p-val	r ²	p-val	r ²	p-val	r ²	p-val	r ²
Base	0.822	0.0006	0.523	0.0046	0.9175	0.0001	0.8071	0.0007	0.5555	0.0039	0.6573	0.0022	0.179	0.0202	0.94	0.0001
Int 1	0.882	0.0003	0.934	0.0001	0.4286	0.0071	0.87	0.0003	0.8354	0.0005	0.5355	0.0043	0.783	0.0009	0.584	0.0034
Int 2	0.839	0.0005	0.8804	0.0003	0.4935	0.0053	0.6092	0.003	0.7513	0.0011	0.1231	0.0268	0.287	0.0129	0.426	0.0072
Critical	0.716	0.0015	0.8472	0.0004	0.9164	0.0001	0.546	0.0041	0.7326	0.0013	0.5155	0.0048	0.146	0.0236	0.346	0.01
Comp.	0.536	0.0044	0.7023	0.0017	0.2985	0.0123	0.9055	0.0002	0.9349	0.0001	0.9476	0	0.655	0.0023	0.725	0.0014
Rec 1	0.582	0.0034	0.6613	0.0022	0.1779	0.0203	0.5243	0.0046	0.7507	0.0011	0.338	0.0103	0.13	0.0256	0.46	0.0024
Rec 2	0.74	0.0012	0.5639	0.0038	0.4535	0.0063	0.5486	0.0041	0.7187	0.0015	0.3165	0.0117	0.0755	0.0351	0.265	0.0139

*Highlighted: p<0.2

**Base = Baseline; Int 1 = Intervention 1; Int 2 = Intervention 2; Critical = Self-Critical Writing Task; Comp = Self-Compassionate Writing Task; Rec 1 = Recovery Period 1; Rec 2 = Recovery Period 2

***SDNN = standard deviation of normal to normal intervals; Mean HR = Mean Heart Rate; LF = Low Frequency Power; HF Power = High Frequency Power; LF Log = Log transformed LF data; HF Log = Log transformed HF data; RMSSD = Root Mean Square of Successive Differences

Results:

Looking at experiential avoidance scores as a continuous variables, we found no significant relationship of experiential avoidance to any measure of HRV. The table shows the p-values and r squared values for the regressions of the variables measured by the ECG and blood pressure monitor. Highlighted values were the close to significant, however, they are still not significant.

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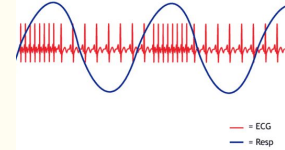
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Example of Biofeedback Data: HRV



Discussion:

Our results contradict previous research that suggests that there is a relationship between HRV during stressful tasks and experiential avoidance levels. However, these findings may be the result of some of this study's limitations. The first limitation to note is that this study was a secondary analysis of pre-existing data and was not powered for the secondary analysis. The study was designed to study the effects of biofeedback breathing in comparison to a compassion-focused therapy (CFT) breathing exercise. Additionally, none of the participants had previous experience with biofeedback. Participants in the biofeedback breathing group could have had trouble following the pacer which could have added more variability in the HRV data that we recorded. This study consisted of an in-lab experience - which may not represent a participant's true physiological response. Additionally, we lacked a diverse sample. We took a convenience sample to recruit participants, and the majority were college-aged, caucasian female students attending Brigham Young University. Furthermore, our sample had a restricted range of scores of experiential avoidance measured by the AAQ-II. If we had a larger range of scores that was more representative of wider population, perhaps we would have seen a stronger relationship between the variables.

Future studies should include a more diverse and larger sample than the current study. Researchers should recruit participants that have biofeedback experience. A future study should also be powered to analyze the relationship between personality traits and physiological feedback. This will address the limitations above and increase the power of the study.