Gender Differences in Vagal Tone Adaptation in an Expressive Writing Paradigm

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ABSTRACT

Research shows that writing about traumatic, stressful or emotional events is associated with improved health and well-being. We assessed the effects of a standard vs. meaning-making expressive writing format on autonomic nervous system function over time. Heart rate and to a lesser degree, vagal tone, improved over time in both conditions but vagal tone and respiration changes were moderated by gender.

INTRODUCTION

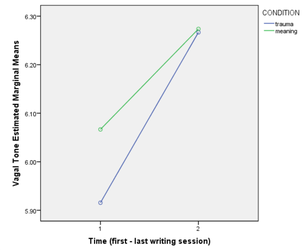
An extensive body of literature shows that writing about traumatic or emotional experiences results in improved physical health and emotional well-being. In Pennebaker's (1997) expressive writing paradigm, participants are instructed to write about either traumatic emotional events or neutral topics over several sessions. Those assigned to the expressive writing condition typically display physical and psychological health improvements over time compared to the control condition. This study extends pilot work we did in our lab which found that when participants engaged in cognitive restructuring (subjects were asked to reframe an emotional experience in positive terms i.e., meaning-making), vagal tone and heart rate improved. A second major difference in our study versus previous published work is that our study assessed the effects of expressive writing on autonomic nervous system responses (e.g., vagal tone, cardiac impedance) over time.

METHOD

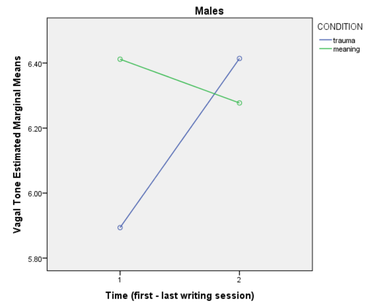
Fifty subjects (25 male), ranging in age from 18 to 44 years (M=24.64; SD=6.18 yrs.), participated. Each was randomly assigned to the standard expressive (n=24) or the meaning-making (n=26) condition. Subjects wrote for at least two sessions and most wrote for three while physiological measures were recorded. Subjects viewed a neutral video (ocean) for three minutes. Next, they were instructed to write continuously for 15 minutes about a traumatic experience followed by viewing the neutral video. A series of questions was asked at the end (e.g., "how traumatic was the experience you just wrote about?").

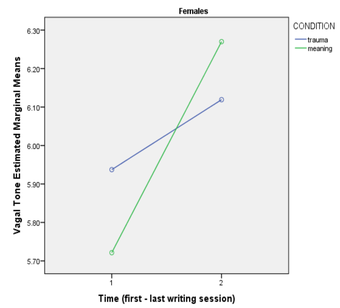
Results

A repeated-measures ANOVA comparing the first to the last writing session within-subjects and gender and condition between subjects showed a trend in improvement in vagal tone over time, F(1, 45) = 3.430, p = .071. The main effect of condition was not significant, indicating there was no difference between the standard expressive and meaning-making conditions, F(1, 45) = .092, p = .764.



However, there was a Time x Condition x Gender interaction, F(1, 45) = 2.874, p = .097 that approached significance. Males in the standard writing condition showed improved vagal tone over time whereas the males in the meaning-making condition did not.





In contrast, women showed significant improvement in vagal tone over time in the meaning-making compared to the standard writing condition.

We conducted the same analyses for respiration and heart rate. For respiration, we found a significant Time x Gender interaction, F(1, 45) = 6.229, p = .016 where men's respiration improved over time across conditions but women's respiration did not change in the standard writing condition and declined somewhat in the meaning making condition. In analyzing heart rate, we found a main effect of Time, F(1, 45) = 8.159, p = .006 and no significant interactions. Men and women in both writing conditions showed improvement in heart rate over time.

Discussion

The results of this study show that expressive writing results in improved heart rate and a trend towards improvement in vagal tone over time for both expressive writing conditions. However, it is likely that women may benefit more from a meaning-making expressive writing paradigm compared to the standard whereas the opposite may be true for men and they may benefit more from a standard expressive writing format.

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