The Effects of Relationships on ANS function and Wellness

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Background

The quality of relationships and social networks plays a vital role on well-being (Feeney & Collins, 2015). Social support is linked to positive biological profiles in that social support protects against the negative effects of changes in cardiovascular, neuroendocrine, and immune function. Furthermore, when exploring Autonomic Nervous System (ANS) function, higher heart rate variability has been shown to reflect a psychophysiological state compatible with social interaction (Quintana, Guastella, Outhred, Hickie, & Kemp, 2012). Social support has been shown to buffer against the negative effects of life stressors (Cohen & Wills, 1985), and ultimately, mortality (Holt-Lunstad, Smith, & Layton, 2010). In summary, social relationships are important for both health and well-being (see review: Cohen, 2004).

Alternatively, social isolation, social disconnectedness, and loneliness have been shown to have negative effects on health (Cornwell & Waite, 2009) as individuals who are socially isolated display not only psychological, but also, physical consequences such as: increased risk of inflammation and hypertension (Yang et al., 2016) and greater vascular resistance, slower wound healing, and poorer sleep efficiency (Cacioppo & Hawkley, 2003). In a neuroimaging study examining the effects of social exclusion on health, results show that "social pain is analogous in its neurocognitive function to physical pain" (Eisenberger, Lieberman, & Williams, 2003, pp. 292).

In college students, females report more stress from romantic relationships, relationships with their parents, and quality of peer relationships when compared to their male counterparts (Darling, McWey, Howard, & Olmstead, 2007). Concordantly, aspects of social well-being (i.e. need to belong) tend to have greater negative impacts on college-aged females when compared to males (Baldwin, Towler, Oliver, & Datta, 2017). Moreover, the quality of such relationships have both psychological (Umberson & Montez, 2010), as well as physiological (Heaphy & Dutton, 2008) ramifications on health.

In order to better understand the health and well-being of an individual, one should consider his/her relationship qualities and characteristics. Although much is known about the positive and negative consequences that relationships have on individual health such as: research is lacking regarding its connection between ANS function and domains of wellness (i.e. physical, social, emotional, spiritual, psychological, intellectual). It is critical to examine the effects of both quantity and extent of relationships in conjunction with health and wellness to truly understand the effects that relationships have on quality of life.

Study Aims/Hypotheses

This study aimed to explore the connection between relationships, wellness, and ANS function. Our main hypotheses were as follows:

(A) there will be a negative correlation between perceived stress and the number of meaningful relationships

(B) overall wellness will be positively correlated with number of meaningful relationships,

(C) there will be a positive association between perceived social support and the number of meaningful relationships,

(D) the number of meaningful relationships will predict wellness,

(E) the number of meaningful relationships will reflect better ANS function at rest

(F) mental imagery of one's most meaningful relationship will result in better ANS function when compared to baseline.

Methods

Participants: One hundred sixty college students (M = 18.63, SD = 1.17) were asked to complete a survey package (demographics, wellness, perceived stress, and relationship satisfaction).

Materials Used: Once complete, participants were asked to sit quietly for 5 minutes prior to obtainment of physiological measures [Heart Rate Variability (HRV), Skin Conductance (SC), and Electroencephalography (EEG)]. After this acclimation period, participants were prepared for physiological recordings using the Thought Technology sensors interfaced with their software program and assessed for 5 minutes.

Procedure: After baseline readings, the social manipulation was introduced. First, participants were asked to list all of the important relationships currently in their lives and indicate the significance/roles of the aforementioned relationships. Next, they were asked to indicate the most important relationship to them and then asked to think about this relationship while creating and maintaining an image of this relationship in their mind with their eyes closed until further notice. During this time, HRV and SC recordings were taken simultaneously for two minutes. Upon completion of this task, participants were thanked for their service.

Results

Table 1

Variables		Relationships	PSS	PWS	SPS
Relationships	Pearson Correlation	1	0.001	0.184**	0.035
	Sig. (2-tailed)		0.989	0.039	0.697
	N		126	126	124
PSS	Pearson Correlation		1	-0.650**	-0.261**
	Sig. (2-tailed)			0.000	0.010
	N			98	98
PWS	Pearson Correlation			1	0.446**
	Sig. (2-tailed)				0.000
	N				98
SPS	Pearson Correlation				1
	Sig. (2-tailed)				
	N				

Note. PSS = Perceived Stress Scale. PWS = Perceived Wellness Scale. SPS = Social Provisions Scale.
**. Correlation is significant at the 0.01 level (2-tailed).

Table 2

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	62.057	1	62.057	4.356	0.039*
Residual	1766.688	124	14.247		
Total	1828.744	125			

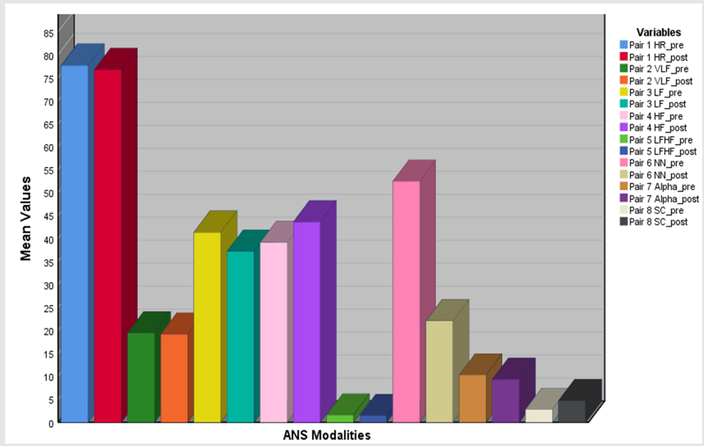
Dependent Variable: Overall Perceived Wellness
Predictor: (Constant), Number of Relationships

Table 3

Variables		Psychological	Emotional	Social	Physical	Spiritual	Intellectual
Relationships	Pearson Correlation	0.064	-0.023	0.188*	0.028	0.140	0.201*
	Sig. (2-tailed)	0.480	0.801	0.036	0.756	0.119	0.024
	N	125	125	125	125	125	125
Psychological	Pearson Correlation	1	0.593**	0.442**	0.297**	0.717**	0.350**
	Sig. (2-tailed)		0.000	0.000	0.001	0.000	0.000
	N		130	130	130	130	130
Emotional	Pearson Correlation		1	0.361**	0.425**	0.653**	0.408**
	Sig. (2-tailed)			0.000	0.000	0.000	0.000
	N			130	130	130	130
Social	Pearson Correlation			1	0.307**	0.484**	0.178**
	Sig. (2-tailed)				0.000	0.000	0.043
	N				130	130	130
Physical	Pearson Correlation				1	0.371**	0.206**
	Sig. (2-tailed)					0.000	0.019
	N					130	130
Spiritual	Pearson Correlation					1	0.510**
	Sig. (2-tailed)						0.000
	N						130
Intellectual	Pearson Correlation						1
	Sig. (2-tailed)						
	N						

Note. *. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Figure 1



Conclusion/Implications

1.) Higher quantities of significant relationships is positively associated with enhanced perceptions of quality of life.
2.) Higher numbers of significant relationships reflect both the ability to create and maintain meaningful relationships (social wellness), and the seeking out of mentally stimulating activities (intellectual wellness).
3.) Consistent with Lane et al. (2009), conscious emotional experiences, reflected in the current study's mental imagery task, led to increases in arousal (increased SC) and in modulating effects on the heart (increased HF, decreased LF HRV) allowing for contextually appropriate emotional responses.
Our results suggest that relationships are vital in our perception of wellness and can reflect changes in autonomic function. Thus, due to the importance and prevalence of relationships in today's society, whether platonic, romantic, parental, or religious, all relationships have the potential to impact one's quality of life and subsequent health status.

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