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A Model to Explore the Origin of Heart Rate Variability.

Heart rate variability (HRV) is the variation in the time interval between heartbeats. Correlation between loss of HRV and a body undergoing a state of stress (exercise, disease, etc.) has been well documented in clinical practice and experimental studies. However, this correlation has not been fully linked to underlying physiological mechanisms. Previous work hypothesizes that current cardiovascular models need to incorporate a respiratory component to capture the variability seen in heart rate data. This work attempts to model heart rate as a function of blood pressure and respiration, and incorporates neuroendocrine control of these mechanisms by the parasympathetic and sympathetic branches of the nervous system, to explain the source of HRV in a resting, healthy state. (Received September 25, 2018)