

College campus cat: Exploring PetPace collar data and survey data to measure physiological responses and physical activity during campus visits

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Introduction. Smartcollars function as non-invasive tools to measure animals' physiology and activity in naturalistic settings. The current study describes PetPace smartcollar data collected in a cat with owner-provided survey data to compare data collected in the context of campus visits with the cat's behavior at home. First, heart rate variability (HRV) and physical activity are compared between campus days and days at home. Second, associations between smartcollar data and survey data are explored.

Methodology. Continuous 24-h smartcollar data and daily survey data were collected during 55 days, of which 3 days during campus visits. The smartcollar provided continuous (i.e. every 2 to 15m) data about HRV and activity (except 2-3h charging time every 3-4 days). HRV was calculated using vasovagal tonal index and activity was measured with a tri-axial accelerometer. The owner provided survey data at the end of each day about perceived stress and activity in the cat. Smartcollar data were aggregated on the day level and merged with the survey data.

Results. First, the collar measured higher HRV, indicating lower stress, on campus days (Mdn = 9.2) compared to days at home (Mdn = 9.0); the distributions differed significantly (Mann-Whitney U = 26.00, $p < 0.05$). Second, interestingly, we found no significant Kendall's tau-b correlations between collar-measured and survey-reported activity ($\tau_b = .10$, $p = .38$) or stress ($\tau_b = .18$, $p = .16$).

Conclusions. While exploratory, our study is the first that examined associations between a cat's 24-h physiological data and daily survey data collected in home and campus contexts. Since significant differences were found between HRV at home and on campus, which were not explained by survey data, this study provides evidence that methodological approaches to examine campus cats' stress may benefit from incorporating HRV and activity through smartcollar measurement rather than through survey data alone.