Temporal investigations of Paige E. Connell & Sarah K. Hu's interactions in the Caron lab

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INTRODUCTION

It is well known that Paige E. Connell (PhD), and Sarah K. Hu spend a lot of time together. However, studies illustrating this time together are sparse. Based on recorded events and empirical observations, we present explanations of how much time (and the nature of this time) these two spend together at both diel and annual scales.

TAKE HOME MESSAGE

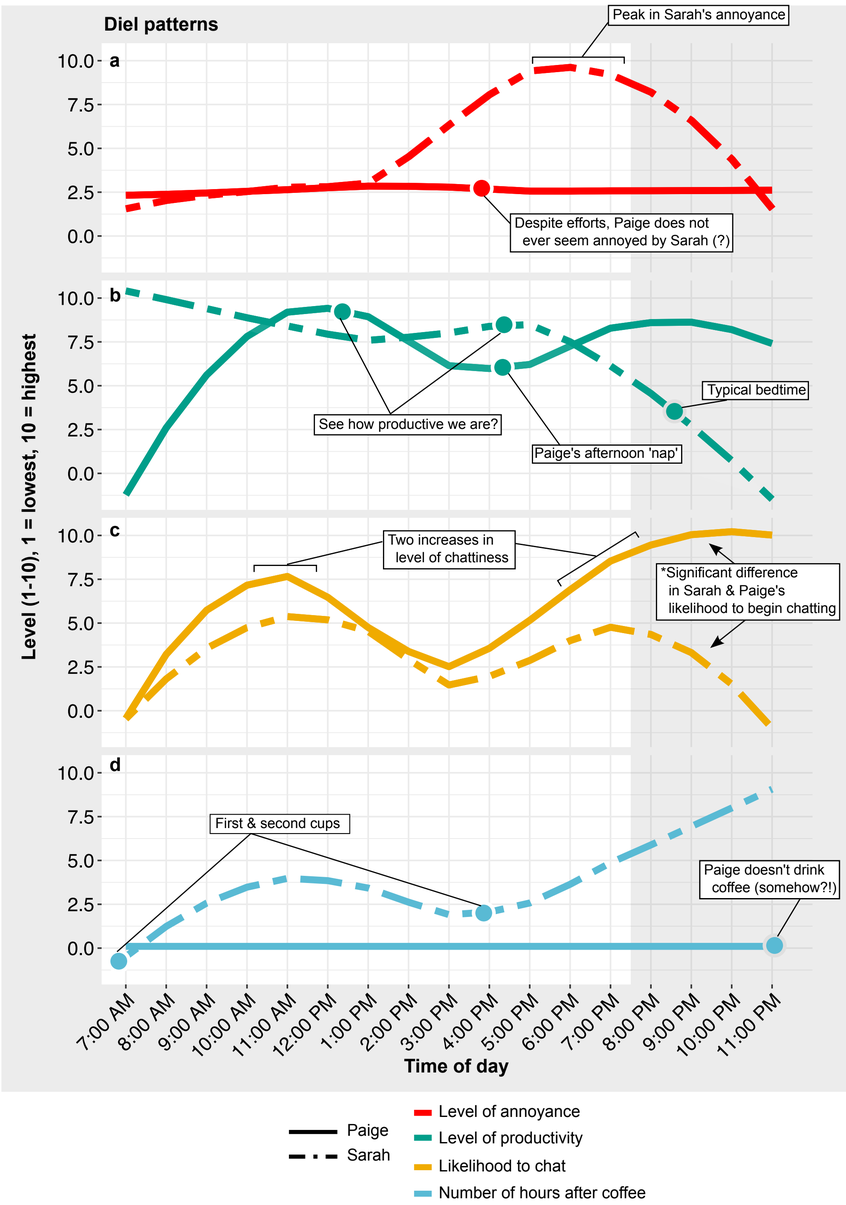
Congratulations Doctor Paige E. Connell. Thank you for being a wonderful lab mate, friend, & sister. The evidence presented here suggests that we've had too much fun getting our PhDs.

A glimpse into daily life

What happens throughout the day in Paige & Sarah's office?

Figure 1. Daily trends for Paige & Sarah. Trend lines represent the mean level, on a scale of 1 (lowest) to 10 (highest), for either Paige's or Sarah's **(a)** annoyance of one another, **(b)** personal level of productivity at work, **(c)** likelihood to strike up conversation at work, and **(d)** hours post coffee consumption. Paige (solid line) and Sarah (dotted line) spend an extraordinary amount of time together while at work. Their individual behaviors influence one another, impacting Sarah's ability to tolerate Paige (a) and their productivity levels (b). As scientists, they recorded totally real (definitely not made up) observations at each hour. Smoothed trend lines were calculated based on fitting a simple model to local subsets of data (LOESS method, which combines linear least squares regression and nonlinear regression). Grey sections indicate nighttime.

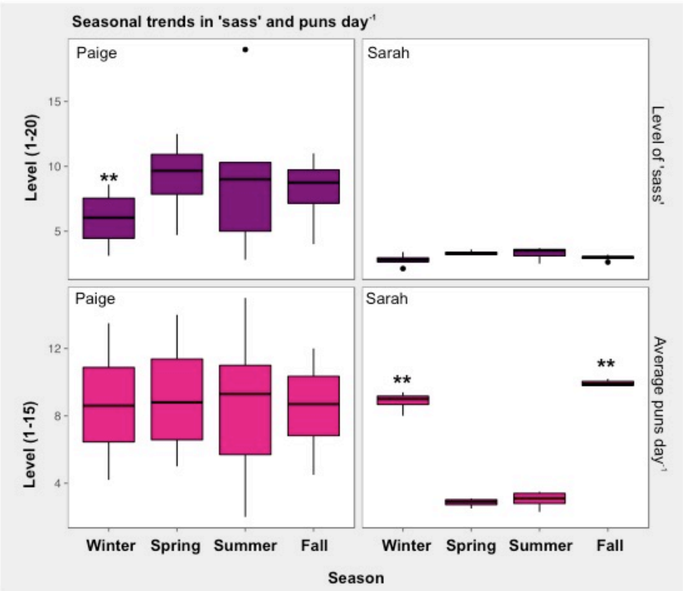
Findings: While Paige's annoyance with Sarah is non-existent, Sarah appears to have a peak in level of annoyance from mid- to late afternoon (a), which promptly ends with her bedtime (8-9PM). This increase in Sarah's annoyance of Paige corresponds to Sarah's decrease in productivity (b). Part b also illustrates the differences in Sarah and Paige's peak work times; Sarah begins her day earlier with peaks in productivity following coffee consumption (d), while Paige's highly productive hours are late morning and early evening. Fostering their strong friendship in and out of the lab, both Paige and Sarah's level of chattiness peaks in the mid morning hours and during dinner time (c). However, note that Sarah's likelihood to chat always remains lower than Paige's.



Seasonal 'sassiness'

Observed seasonality in 'sass' and pun rates.

Figure 3. Box plots of seasonal trends in 'sass' and puns per day. Box plots represent the distribution of either 'sass' (top) or average puns per day (bottom) from Paige (left) or Sarah (right). The lower and upper components of each box represent the 25th and 75th percentiles, respectively, and the median is denoted by the horizontal line. Vertical lines (whiskers) extend to the lower and higher values, if a value is smaller or larger than 1.5 of the inter-quartile range, it is noted by a data point (outlier). Asterisks (**) indicate significantly different values based on season.



Findings: Overall, Paige's 'sass' and puniness varied year to year within each season (Figs. 2c and 2d). The only significantly lower 'sass' season for Paige was in the winter. Authors speculate that Paige's level of 'sass' is lowest when she is coldest. Additionally, Sarah's rate of puns delivered per day appears to be seasonal: highest in the winter and fall. This could be attributed to Sarah's preference of season and frequency of holidays during months of peak puniness. Based on the data presented it is obvious that, in addition to being productive and awesome PhD students, Paige and Sarah's daily and seasonal friendship is important.

Time in graduate school

Monthly to annual trends correspond to significant events from the past four years.

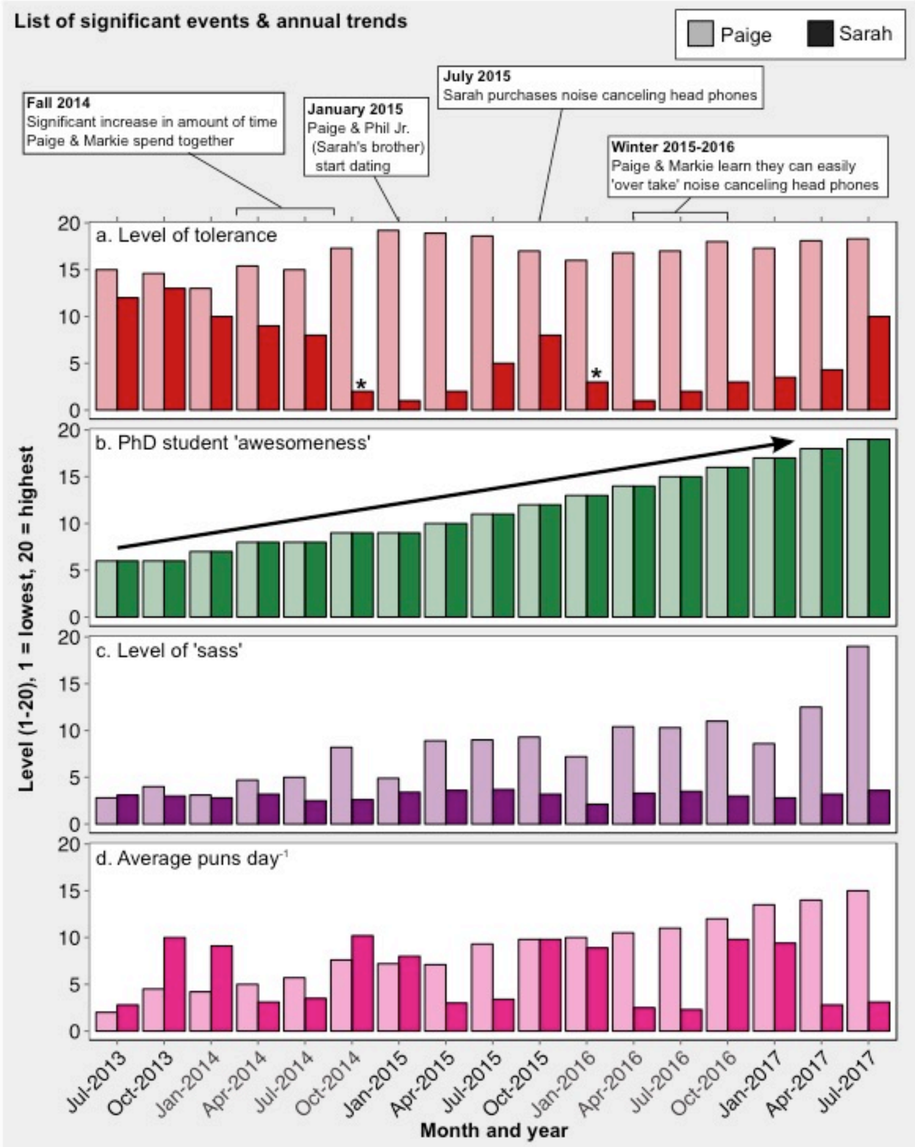


Figure 2. Annual trends. The totally real and not fake data collected by Sarah was averaged quarterly to examine annual trends over the course of Paige's graduate tenure. A list of significant events (top) provides a brief history of the relationship among Sarah, Paige, Markie, and Phil Jr. On a scale of 1 (lowest) to 20 (highest), bar plots demonstrate Sarah and Paige's level of **(a)** tolerance of one another, **(b)** PhD awesomeness, **(c)** sass, and **(d)** the average number of puns delivered per day. Lighter colors represent Paige and darker colors represent Sarah. 'Awesomeness' is defined by how great a student each one is (right, Dave?). Asterisks (*) denote significant decreases from earlier months.

Findings: Similar to Fig. 1a, while Paige's tolerance of Sarah is consistent, Sarah's fluctuates (a). Significant decreases in Sarah's tolerance of Paige corresponds to events over the course of the past 4 years. First, Sarah's wife (Markie) and Paige became best friends forever (BFFs) during the Fall 2014. Shortly thereafter, Paige entered a relationship with Sarah's little brother (Phil Jr.), increasing the amount of time she spent at Sarah and Markie's home. In response to Markie and Paige 'always hanging out', 'punching peppers', and randomly singing musicals, Sarah purchased noise canceling head phones ($300). However, this only temporarily increased Sarah's tolerance of Paige, as in the winter (2015-2016), the noise canceling head phones were found to be no competition for the frequency at which Paige and Markie sing musicals. Regardless, Sarah's tolerance of Paige is projected to increase, as Sarah loves Paige and they could also be defined as 'BFFs'.
Over the course of the past 4 years, both Paige and Sarah have become AWESOME PhD students (obviously, b). Paige's level of (c) 'sass' (or sassiness) and (d) average number of puns delivered per day has steadily increased since her start as a PhD student. Sarah's level of sassiness has remained relatively low (compared to Paige), while Sarah's pun rate appears to be seasonal for some reason (Fig. 3).

Actual pictures from working (*pics or it didn't happen*).

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