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Is Tutoring Stressful?: Measuring Tutors' Cortisol Levels

Erik Simmons
Queensland University of Technology

Laura K. Miller, Caroline Prendergast, and Christiana McGuigan
James Madison University

When exploring the emotional work of tutoring, writing center literature typically foregrounds writers' emotional health, with limited consideration of tutors' wellbeing or stress levels. For instance, tutors are advised to "gauge the cognitive load of student writers" (Feitosa 15) and be attuned to writers' mental states (Bullock), in addition to helping their peers self-regulate their emotions (Kervin and Barrett). Tutors may even take on the role of counselor or "psychoanalyst" if students "exhibit behavior patterns of anxiety, self-doubt, negative cognition, and procrastination" (Murphy 14). Although experienced tutors know their work can be emotionally draining and stressful, current research does not fully investigate these experiences. To address this gap, researchers in our writing center explored tutor stress, compassion fatigue, and burnout in a pilot study, the results of which we shared at the 2014 International Writing Centers Association Collaborative (Schubert et al). We found, by surveying tutors (n = 7), that factors within the tutoring session (e.g., stressed students, unfamiliar genres, language barriers) caused more stress for tutors than external factors (e.g., coursework, personal issues, health). The top three stressors for tutors were self-imposed high performance expectations, weak papers, and "problem" students (i.e., students who were demanding or rude). Although our response rate was low (15% of total staff), these preliminary results identified potential stressors and inspired us to design a biometric study to understand how stressful tutoring can be.

While some stress can be beneficial, high levels of stress are associated with a variety of health problems, including cardiovascular disease, decreased immune response, and sleep disruption (Kelloway et al.). Stress can also impair thinking and decision making (Porcelli and Delgado). In the writing center,

tutors are expected to prioritize among various writing concerns; however, session productivity may suffer if stress impedes a tutor's ability to make sound judgments. Noreen Lape has argued that tutors need to develop their emotional intelligence in order to enact "a pedagogy of empathy" (3), but we have little evidence that describes how this pedagogy influences tutors' emotional states. Since writing centers are places where we often labor in under-resourced working conditions (Boquet), studying stress in this context should be a higher priority.

BIOMETRICS IN THE WRITING CENTER

To explore tutors' stress levels in greater depth, we used biometric procedures, which are methods of quantifying physiological states and characteristics (e.g., heart rate monitors, voice analysis, skin conductance response tests). We measured salivary cortisol levels, which indicate how much cortisol (a hormonal indicator of emotional stress) is present in a person's saliva. Cortisol is a commonly used biological indicator of stress, and it provides reasonably accurate information about the physiological processes that contribute to perceived stress levels (Hellhammer et al.). Although it may seem counterintuitive to study tutoring through a biological lens, evidence provided by carefully applied biometric techniques can expose previously invisible tutoring experiences. Additionally, biometric approaches to stress measurement can complement commonly-applied self-report approaches. Although both biometric and self-report techniques provide limited views of stress, we chose a biometric approach because of its underrepresentation in existing writing center literature. Specifically, we chose to measure salivary cortisol (instead of urinary or blood-based cortisol measurement techniques) because it provides a relatively easy method of cortisol measurements without inducing additional stress in participants. Moreover, salivary cortisol has been found to correlate highly with plasma and serum cortisol measurements (Hellhammer et al.).

We were guided by the following research question: Do writing tutors at our university show changes in cortisol levels before and after a tutoring shift? We hypothesized that tutors would experience higher levels of stress, reflected through elevated cortisol levels, after completing their tutoring shifts. We designed this study to provide a preliminary understanding of stress, knowing that we could not account for all of the confounding factors that may contribute to tutor stress. Our goal was not to provide a definitive understanding of the experience of stress in the writing center, but to explore tutors' stress levels through a biometric lens, a model for research methods not previously used in writing center research.

METHOD

In total, 18 subjects participated in the study and ranged in age from 19 to 45. Research participants included four faculty tutors and 14 peer tutors who were employees in our university's writing center. Participants were recruited through the writing center's email list and in person during weekly professional development meetings. Participating tutors provided a saliva sample upon entering the writing center and then worked their shifts as usual. Tutors provided a second saliva sample immediately following their shift. Shift durations ranged from one to four hours, and samples were collected from any time between 10:00 a.m. and 8:00 p.m.

After all samples were collected, we processed them using the Salimetric Cortisol High Sensitivity Enzyme Immunoassay Protocol. In general, the range and interpretation of cortisol concentration varies widely based on a number of factors, such as the type of analytical procedure used, the gender and age of subjects, and the time of day. The average half-life (rate of metabolization or natural decay) for cortisol is 66 minutes. This means once cortisol is secreted, it takes, on average, 66 minutes for the body to reduce levels of original secretion in half (Weitzman et al.). Given this half-life, the cortisol level measured at the end of the shift was influenced by stress levels during the shift and at the time of collection. According to the interpretation guidelines provided by the manufacturers of this particular assay kit, an acceptable range for our sample would be approximately 0.021 (extremely low stress) to 1.551 (extremely high stress) micrograms per deciliter. Lower scores indicate lower cortisol concentration.

To interpret tutors' stress levels, we calculated the difference in scores between pre- and post-sample cortisol concentrations (i.e., the difference between the mean pre-shift cortisol concentration and the mean post-shift cortisol concentration). A paired samples *t*-test was used to compare the mean scores of pre-samples to post-samples. Although additional factors may induce stress (e.g., tutor demographics, length of shift, or time of day), our analyses did not account for these factors due to the limited sample size and the exploratory nature of the study.

RESULTS

Our overall findings suggest that tutors' stress levels significantly decreased from pre-shift to post-shift, which contradicts our hypothesis. The paired samples t-test indicated a statistically significant difference between pre-shift samples (M = 0.47, SD = 0.46) and post-shift samples (M = 0.09, SD = .05), $t(17) = 3.735$, $p = .002$. This difference suggested a large effect size (d = 1.16).

Specifically, cortisol concentration (measured in micrograms per deciliter) decreased by an average margin of 0.38: a 65% decrease over the span of a shift. The magnitude of the difference varied greatly across participating tutors (see fig. 1).

Figure 1 displays the observed salivary cortisol concentrations for each of the 18 sample pairs. Each line represents one participant's sample pair. The horizontal axis displays the two time points at which data were collected (pre-shift and post-shift), and the vertical axis displays the salivary cortisol concentration in micrograms per deciliter. The dotted line indicates the mean values for pre- and post-shift cortisol concentration (0.47 and 0.09, respectively). Note the high variance among the pre-shift samples compared to the relatively uniform post-shift sample values.

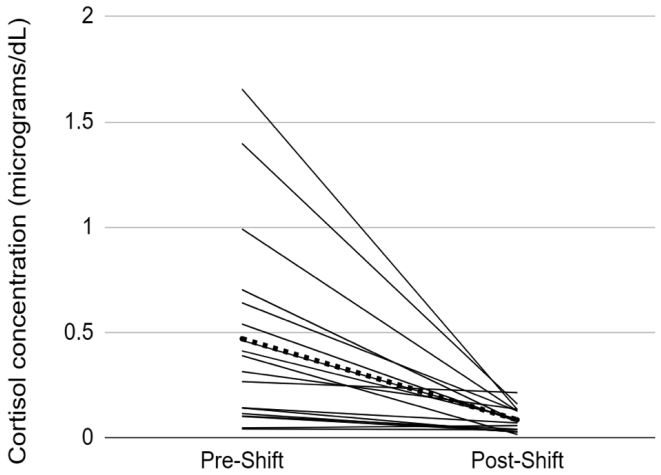

Fig. 1. Comparison of Cortisol Concentrations for Individual Participants.

DISCUSSION

Although we hypothesized that cortisol levels would be higher at the end of a tutoring shift than at the beginning, we found the opposite to be true: cortisol levels dropped significantly after a tutoring shift. Our preliminary study was able to identify this pattern of decreased stress, but more rigorous studies are necessary to verify this effect, explain why this pattern occurs, and explore additional factors that may affect tutor stress. As noted by Hellhammer et al., there are a variety of physiological, demographic, and situational factors (e.g., gender, medication, health) that influence salivary cortisol levels. Future investigations may seek to control statistically or methodologically for these influences. One possible explanation for our findings is that tutoring provides an opportunity to

simultaneously perform meaningful work and reduce stress—perhaps because tutoring is a helping profession. Research has shown that helping others can alleviate the stress of the helper (Melkman et al.) and contribute to reports of more life satisfaction (Buchanan and Bardi). For example, productive sessions may allow tutors to share in students' relief and appreciation. Tutors may also enjoy the process of helping others and the work of tutoring. These positive emotions could explain the decreased cortisol concentrations. Some research also suggests that increased social interaction may reduce cortisol levels, meaning that the social interaction inherent in tutoring may lead to lower stress (Stetler and Miller).

It is also possible that tutoring provides a welcome reprieve from outside stressors, as tutors get a break from class obligations and personal stress. Research has shown that work breaks can prove mentally advantageous for remaining sharp and engaged (Ariga and Lleras). Conversely, the expectancy of starting a new task could increase stress. For example, a tutor coming from a class with an entire work shift ahead of them may experience heightened stress. As the shift ends and another portion of the day is complete, the tutor may experience relief, which could explain part of the decrease in cortisol concentration. However, since the half-life of cortisol is 66 minutes, relief could only play a part in reduced cortisol levels because the post-session sample still reflected cortisol levels secreted during the shift. In the future, collecting mid-shift saliva samples could provide richer information about when and how steeply cortisol levels change during a shift. For comparison, researchers may also examine how tutors' stress levels change over a comparable period of time in the absence of tutoring (e.g., while reading or writing). In addition to collecting more biometric information, researchers could interview or survey tutors about their stress before and after tutoring shifts. For example, survey items such as "Before a shift, I am often anxious about how it will go" and "After a shift ends, I feel a sense of relief" could effectively supplement biometric measurements.

The observed decrease in cortisol concentrations could also be attributed to the task at hand. Tutoring is challenging, but if a tutor's skills adequately meet that challenge, a tutor may experience a flow state—extreme, goal-directed focus on a task (Csikszentmihalyi). In a flow state, people can lose a sense of time, experience reduced self-focus, and devote all their attention to the activity at hand. If a tutor feels a sense of flow while tutoring, they are likely not ruminating on personal stressors, which could cause cortisol levels to decrease. Different skill levels could affect flow states; therefore,

future research could investigate links between stress experiences during tutoring sessions and tutors' levels of skill and education (e.g., differences between undergraduate peer tutors and faculty tutors). It is also possible that a tutor's perception of a session's effectiveness influences their stress levels. Future researchers could therefore explore relationships between tutors' perceptions of success and their experiences of stress and flow.

We acknowledge that our exploratory study has limitations. For one, we had no control over participants' behavior outside of the workplace. Participants were instructed not to engage in any activities that would influence cortisol levels, such as eating large meals, exercising immediately before a shift, drinking alcohol, or consuming caffeine within 15 minutes of providing a sample; however, participants may not have followed these instructions from the assay kit. Also, the writing center's location on campus required some degree of physical activity, as students walked from other buildings on campus to begin their shift. By the time the post-shift sample was collected, tutors had likely been sitting for several hours, which could explain lower cortisol levels. Future research could investigate this possibility by including a control group of tutors who sit in the writing center for two to three hours before data collection. This research design could help isolate the social effects of tutoring from the physical effects.

This small study was also unable to differentiate between contextual or demographic factors because the sample size lacked sufficient power to investigate additional variables of interest. For example, we could not study whether different shift durations were associated with different stress level changes because there were not enough participants in each condition for comparison. It is possible that different shift lengths and number of tutoring sessions accounted for different levels of stress reduction. A larger sample or replication across different universities would represent more demographic variation in peer, graduate, and faculty tutors, which would enable researchers to explore other important variables (e.g., age, gender, ethnicity, experience level). Despite our inability to control for these variables, the consistent trend seen in this data set suggests that a similar pattern of decreased stress levels could be expected in future research.

These findings provide a glimpse into the stress experienced by writing center tutors. Although we cannot determine causality, we encourage more biometric approaches to investigating tutors' experiences because they can illuminate otherwise veiled experiences. For instance, we can envision researchers using

affordable heart rate monitors or smartphone apps to track and monitor tutors' or clients' moods. Measures of psychological constructs inevitably represent a single piece of the emotional picture; therefore, repeated research using a variety of approaches and modes of study is critical to developing a more complete understanding of tutors' and clients' experiences. Collaborating with scientists across disciplines who can help administer such experiments, as we have done, is an approach we hope others will also undertake. We believe biometrics offer unique ways to make the invisible labor of writing center work (Caswell et al.) more observable.

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