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## Does Peer-to-Peer Writing Tutoring Cause Stress? A Multi-Institutional RAD Study

Matthew Nelson

Loyola Marymount University, matthew.nelson@lmu.edu

Kathleen Weaver

Loyola Marymount University, kat.weaver@lmu.edu

Sam Deges

University of California, San Diego, sdeg9@gmail.com

Pornchanok Ruengvirayudh

Loyola Marymount University, porsche.ruengvirayudh@lmu.edu

Savannah Garcia

University of La Verne, sgarcia5@laverne.edu

*See next page for additional authors*

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### Authors

Matthew Nelson, Kathleen Weaver, Sam Deges, Pornchanok Ruengvirayudh, Savannah Garcia, and Sarah Dunn



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*Matthew Nelson*

(Loyola Marymount University)

*Kathleen Weaver*

(Loyola Marymount University)

*Sam Deges*

(University of California, San Diego)

*Pornchanok Ruengvirayudh*

(Loyola Marymount University)

*Savannah Garcia*

(University of La Verne)

*Sarah Dunn*

(California State University, San Bernardino,  
Palm Desert Campus)

**Abstract** Writing center literature often notes the stress and anxiety of students as a special concern for peer writing tutors, and tutor training manuals offer advice for tutors on how to manage student writers' anxiety and stress in sessions. Few writing center sources, however, examine the stress/anxiety tutors may experience as a result of their work in the writing center, despite increasing interest in emotions and emotional labor in writing centers. This multi-institutional study examines whether peer writing tutors experience increased stress/anxiety while tutoring. Using a mixed-methods approach combining both surveys and physiological data (salivary cortisol levels controlled against days when they did not tutor), this study investigates the stress/anxiety of 21 tutors across 63 tutoring appointments. The data suggest that peer tutors who enter tutoring sessions in stressed or anxious states are potentially prone to increased stress or anxiety from tutoring. Moreover, they exhibited an inhibited awareness of both student writers' stress and the potential impact of that stress on tutoring sessions. Results suggest that writing centers should increase their focus on tutor well-being, most crucially on emotional labor and its impacts for peer writing tutors.

**Keywords** stress, cortisol, RAD research, emotional labor, writing tutoring, writing centers

## Introduction

Peer writing tutoring occurs at a curiously central point in both the institution and the "life cycle" of a writer's learning. The tutor

sits midway between instructor and learner, between expectations and understandings, between start and finish, between learning process and graded product. It is not surprising then that, working at such a potentially

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fraught fulcrum, tutors themselves report students' feelings as a prominent factor in their work. Responding to student writers' emotions "[is a] common, everyday [experience] for writing tutors, not only because college can be emotionally taxing, but also because writing centers may be perceived as places students go to feel better as often as they are perceived as places to get help with writing" (Driscoll & Wells, 2020, p. 17). Tutor training manuals emphasize the need for tutors to learn to respond to students' emotional states—in particular their stress and anxiety (Holliday & Said, 2008; Martinez et al., 2011; Meyer & Smith, 1987; Newsome, 1991; Ryan & Zimmerelli, 2016; Whitman et al., 1987) and in the day-to-day of any writing center, student stress is a frequent topic of attention and conversation. Tutors routinely report to colleagues and supervisors the effect that student writers' stress—over their writing, their instructors' responses, their self-perceived abilities—has on them.

Yet this topic has been little explored in writing center research. Daniel Lawson (2015), reporting in *WLN: A Journal of Writing Center Scholarship* the results of a systematic search of the archives of both *WLN* and *Writing Center Journal (WCJ)* archives, notes that "there is not much in the way of scholarship on affective dimension in writing center work" (p. 22). Though they were thinking of administrators, Nicole Caswell, Jackie Grutsch McKinney, and Rebecca Jackson's (2016) *The Working Lives of Writing Center Directors* offered a strong call for the field to attend to the centrality of emotional labor in writing center work. Since these voices were raised, attention to the affective components of writing center work, and specifically in tutoring, has grown. The program for the annual conference of the International Writing Centers Association (IWCA) in 2016 reveals, for example, just one session focused on emotions in the writing center; but 2017's program shows at least five sessions connected to emotion (e.g., stress, mindfulness, emotional support in tutoring). By 2018, regional writing center conferences were taking emotion-centered concepts as their central themes—"mindfulness" was the theme of the South Central Writing Centers Association's conference, for example, while "writing

center labor and self-care" was the focus of the East Central Writing Center Association's conference—and two special issues of *WLN: A Journal of Writing Center Scholarship* have focused on the emotional component of writing center sessions and on wellness and self-care in the writing center.

The impact of the emotional components of writing tutoring, especially stress and anxiety, should be a central concern for those of us who work in or oversee writing centers. Research shows that those who work in professions that require emotional work, notably teachers, can over time suffer from emotional exhaustion, burnout, and other long- and short-term negative health effects (Yanay & Shahar, 1998). Students today, even before the COVID-19 pandemic, when our study was conducted, are arriving at college with unprecedented mental health challenges (American College Health Association, 2018; Conley et al., 2020). So as writing center professionals, we need, at a minimum, to clarify the kinds of emotional labor peer writing tutors are asked to perform, as well as the potential effects. As Driscoll & Wells (2020, pp. 18, 25) note, "Emotions are at the core of writing center work. . . . Even if tutors are better trained and more prepared to engage in emotional labor and help students manage emotions, this labor—especially unacknowledged—can take a deep toll on those who perform it." Writing center researchers should endeavor to learn more about the role that affective experiences play in peer-to-peer writing tutoring. Our study attempts to shine light on the issue and to suggest potential future research paths.

### A RAD Approach to Tutor Stress

In 2020, Erik Simmons, Laura K. Miller, Caroline Prendergast, and Christiana McGuigan published an important step for empirical research on emotion in writing center tutoring. Recognizing the outsized role that stress plays in both writing center literature, particularly training manuals, and in the everyday testimony of writing tutors, and the relative lack of research on the topic, the authors examined whether tutoring affected tutors' stress levels. Using a novel approach for writing center

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studies, they looked at biometric measures—salivary cortisol levels—to study the impact of tutoring on stress (Simmons et al., 2020). Cortisol is produced by the adrenal cortex when the body appraises itself as being in a stressful situation (Aschbacher et al., 2013). Cortisol is then, as the authors note, “a commonly used biological indicator of stress,” which “provides reasonably accurate information about the physiological processes that contribute to perceived stress levels” (Simmons et al., 2020, p. 19). These researchers persuasively argue that “evidence provided by carefully applied biometric techniques can expose previously invisible tutoring experiences” (Simmons et al., 2020, p. 19). Pursuing this, their study analyzed cortisol samples submitted before and after tutoring shifts in order to draw conclusions about whether tutoring impacted tutors’ stress levels. Their results surprised them, showing that tutoring actually corresponds with a *drop* in cortisol levels, signaling reduced stress. The authors offer a possible explanation, suggesting tutors may be so occupied by the task of tutoring that they lose their focus on their own stressors, entering a “flow state” while tutoring (Simmons et al., 2020, p. 22).

Simmons, Miller, Prendergast, and McGuigan (2020), however, label their study as “exploratory,” acknowledging the limitations of their methodology: “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” (p. 20). A rigorous, RAD approach should build on the foundations of their approach while accounting for factors excluded by their methodology and analysis, with an open mind about the results. Our study hopes to extend the approach used by Simmons, Miller, Prendergast, and McGuigan (2020) to study tutors’ experience of stress. In doing so, we answer Dana Lynn Driscoll and Sherry Wynn Perdue’s (2012) call for RAD research on writing center work: research that Haswell (2005) defines as “replicable, aggregable, and data supported,” that is to say, an “inquiry that is explicitly enough systematized in sampling, execution, and analysis to be replicated; exactly enough circumscribed to be extended; and factually enough supported to be verified” (p. 201). This

allows the field to “develop multiple situated studies that ask similar questions” (Driscoll & Perdue, 2012, p. 31). Studies of this type remain rare in writing center scholarship. We hope the current study embodies the value of pursuing promising research inquiries using common terms and methodologies.

A RAD project, however, demands careful attention to methodologies—the details of the study design and their implications. In this instance, we must ask our readers to look carefully at the limitations of Simmons, Miller, Prendergast, and McGuigan’s (2020) study in order to properly contextualize the intentions and value of our own.

One particularly salient limitation in Simmons, Miller, Prendergast, and McGuigan’s (2020) project relates to the nature of cortisol in humans. While cortisol provides an excellent biometric measurement of stress (Gozansky et al., 2005; Vining et al., 1983; Vining & McGinley, 1987), it is not without complexity. Cortisol has several functions in the body—in, for instance, both immune response and maintenance of blood pressure—and a predictable diurnal pattern, with a waking peak in the morning and then a reduction from midday into the night (Dorn et al., 2007). Variations away from this diurnal pattern may occur in relation to excitations in one’s emotional or physical state. The design of the Simmons, Miller, Prendergast, and McGuigan (2020) study, however, does not account for natural diurnal variance in either the data collection (e.g., “samples were collected from any time between 10:00 a.m. and 8:00 p.m.”) or analysis (p. 20). The study compared cortisol levels at the start and end of each tutoring shift (which ranged from 1 to 4 hours) without accounting for the natural change in cortisol levels during these time periods, or controlling for the difference in the shift lengths. If pre- and post-tutoring cortisol levels are the same, this actually indicates that the session was in fact stressful; otherwise, cortisol, following its natural diurnal rhythm, would have fallen.

This dovetails with another crucial limitation: Simmons, Miller, Prendergast, and McGuigan (2020) do not establish a baseline for each tutor’s cortisol levels. While the stress level of each tutor’s pre- and postshift cortisol

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levels were compared, no attempt was made to capture these tutors' cortisol levels at comparable times on nontutoring days, meaning that the study could not account for tutors' preexisting stress—a crucial limiting factor; a tutor whose stress appeared to increase while tutoring may simply be experiencing significant daily stress. Moreover, no attempt was made in the 2020 study to account for tutors' self-perceived stress levels, nor of their estimation of the impact of any stress on the tutoring sessions.

## Our Study

Our study aims to assess stress and anxiety in writing center tutors using a mixed-methods approach, combining survey and physiological data, accounting for limitations in Simmons, Miller, Prendergast, and McGuigan's (2020) study in order to extend the field's understanding of this topic. Studying a population ( $n = 24$ ) of peer writing tutors in two universities with very distinct academic and student profiles, our project furthers the examination of the potential impact of stress on peer writing tutors and tutoring sessions. In particular, we investigate the relation between both tutors' self-perceived stress/anxiety, as well as the stresses and anxieties that they may experience as a result of their work with students. Our methodology included surveys to establish participating tutors' perceived stress and anxiety levels prior to their tutoring session, alongside measurements of salivary cortisol levels and surveys detailing tutors' self-perceived stress and anxiety levels both pre- and post-tutoring session. Comparisons between these data, while accounting for both baseline stress levels and diurnal cortisol slopes, help us explore, in a concrete way, stress and anxiety in writing tutors. While not comprehensive or complete, this work, we hope, will shed meaningful light on one dimension of the emotional labor we ask peer writing tutors to carry out, with particular implications for tutor training and practice.

## Background

For writing tutors, managing and responding to emotion is routine in the performance of

the role. Writing tutors are expected to support students as they face novel intellectual challenges—new genres, unclear expectations, ambiguous feedback—and, of necessity, to help students reduce the anxiety that attends these tasks (McAndrew & Reigstad, 2001; Meyer & Smith, 1987; Newsome, 1991; Soven, 2005). Because college writing assignments obligate students to make their own choices about how to best express their own ideas (rather than, say, memorizing information or applying formulas), students often feel vulnerable sharing their writing with others (see for example Ady, 1988). Indeed, college students often feel such angst about writing that writing tutoring manuals and training courses regularly cover it as an area of concern, and training for writing tutors routinely covers (implicitly or explicitly) what kind of emotions are appropriate to display in a tutoring session, as well as strategies for managing the emotions of student writers (see for instance Agostinelli et al., 2000; McAndrew & Reigstad, 2001; Meyer & Smith, 1987; Soven, 2005).

It is worth considering the unique demands this puts on tutors. Beyond conducting themselves in a way that is generally considered polite (i.e., not showing anger when a student is rude or does not participate meaningfully in the session), the tutor is expected to demonstrate *specific kinds* of politeness—a professional politeness considered constructive and positive in a learning environment (Mackiewicz & Thompson, 2018). In practice, this obligates tutors to perform a significant amount of emotional labor. The ability of writing tutors to modulate their own emotions and to respond to students' becomes an explicit factor in the evaluation of their effectiveness in the role. This comes out in the traditional writing center ideal of nondirectiveness. Minimalist ideas of tutoring, though challenged by scholarship old and new (see for instance Denny et al., 2018; Shamon & Burns, 1995), and interpreted and implemented with wide variation in particular centers and sessions, are still largely accepted as the standard for tutoring—setting tutors up for self-perceived failure when they inevitably stray from them (Barnett & Blumner, 2008; Nicklay, 2012). Michael Mattison (2007), for example, explores tutors' understanding of the



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relationship between authority, performance, and emotion within writing centers. In his research, journal entries and letters from tutors illustrate that while tutors recognize there is no one way a session can go *well*, there is still a “correct” way for them, generally, to go (Mattison, 2007, p. 42). In this way, the strictures of the role themselves create a kind of emotional labor for tutors—often a double-bind between wanting to ensure that the student leaves with a piece of writing that will meet their needs while also maintaining the (sometimes impossible) professional standards expected by the job.

It is also worth noting the obvious: Peer tutoring is valued in college settings exactly because peers can more readily relate to those with whom they are working (and vice versa). In this way, the emotional labor required of the peer writing tutor matches nearly exactly Katherine Miller, James Stiff, and Beth Hartman Ellis’s (1988) definition of empathy: “the ability to understand and share in people’s experiences” (p. 254). All guides to peer writing tutoring arguably imply this kind of empathy as a duty of the job, but some explicitly declare it: “We have the complicated responsibility of showing empathy to writers while not allowing them to lose sight of the reason that they came for help in the first place: to express ideas effectively” (Agostinelli et al., 2000, p. 35). Unpacking this “complicated responsibility” illustrates how complex the empathy is that writing tutoring demands—a form of empathy in which the tutor is both partner to the student emotionally and also responsible for directing the session toward some larger aim intellectually. The tutor must be both *with* and yet *beyond* the student, as it were. This obvious tension may offer an explanation for the stress peer tutors often report. It is not, however, how stress/anxiety is discussed in popular writing center manuals. Typically, any focus on the affective aspects of the job in these texts takes the form of helping students manage their stress/anxiety. The need for peer tutors to develop their own emotional intelligence—their own capacities for responding intelligently to the emotional strain and demands of their role—is conspicuously absent.

The absence of research on the stress potentially caused by writing tutoring suggests to

us the need for the current study. Intending to explore the emotional demands working with student writers might provoke for peer tutors, our hypothesis for this study was that stress or anxiety caused by tutoring, in particular by the stress or anxiety a student writer carries into the tutoring session (as perceived by the tutor), could affect the stress level of the tutor. Further, we hypothesized that we would be able to measure that change in stress using surveys, both validated and researcher driven, and salivary cortisol, a known biological marker for stress.

One note: throughout this article, we talk about stress and anxiety somewhat interchangeably. This reflects how these internal experiences overlap, sharing deep connections and mutual implications, including at the neurobiological level (e.g., Daviu et al., 2019: “The intermingled neural circuits controlling both stress and anxiety suggests a strong bidirectional relationship between stress experiences and anxiety” [p. 2]). The relationship between stress and anxiety is both complicated and common sense, but saying how, exactly, the two are related requires some exactitude. Shaving off some complexity, we can say that stress is a response to an internal or external threat, whether actual or only perceived, while anxiety is an emotional response to an anticipated threat with little, or at least uncertain, probability of occurring (Daviu et al., 2019). The distinctions between them are real and meaningful, but in daily experience, they are often linked; and most importantly for our study, both stress and anxiety register in elevated cortisol levels (see for instance Rodrigues et al., 2009; Singh et al., 2012).

## Methods

The “Methods” and “Results and Discussion” sections that follow here, detailing exactly what we studied, how, and what we found, are intended to follow the guiding principle for RAD research: “Observation procedure and data analysis are specified, and participant’s behavior is recorded to the point that someone else could conduct a comparable study to validate, qualify, and perhaps add to the first study” (Haswell, 2005, p. 201). We make

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a point of being very explicit and deliberate here in hopes that other researchers will take up, extend, and improve our approach in future studies. The “Results and Discussion” section, however, requires a more than passing familiarity with statistical analysis methodologies and terms, as well as for physiological research. We can’t write these sections in a way that ensures a novice could follow every detail, nor would we expect every writing center reader to become fluent in these disciplines. We write these sections with an eye toward replicability and would encourage writing center practitioners who might have those ambitions to consider our thoughts on building an interdisciplinary team in the “Replicability” section below. Many readers will, and should, take what they need and leave the rest, dwelling more on the discussion of the results rather than the statistical means by which we arrived at them.

## Participants

Undergraduate writing tutor student volunteers (18 years or older,  $n = 24$ ) were recruited for this study via the writing or learning center at each participating institution by way of a posted flyer, or word of mouth during the spring 2018 semester/quarter for both institutions (University 1 and University 2). Institutional Review Board approval was gained, and interested, eligible participants were asked to complete an informed consent form prior to study participation.

University 1 volunteer tutors ( $n = 10$ ) participated within a 10-day period during the semester and University 2 ( $n = 14$ ) volunteer tutors within a 14-day period during the quarter. The dates for the study were selected by each institution based on traffic flow and logistics, and tutoring appointments were scheduled by student writers without having prior knowledge of the study.

## Study Settings

In writing center research, as in writing center practice, context and locality matters. Situating our project as a cross-institutional study, we felt, would help us avoid some of the caveats that attend writing center

research—ways that hyper-local conditions can undermine, or at least greatly complicate, attempts to generalize knowledge across contexts. We offer here details on the two universities involved in the study, which have very distinct academic and student profiles.

University 1 is a Hispanic Serving Institution with around 8,000 students enrolled in undergraduate and graduate degree programs across multiple campus locations. During the year under study, nearly 5,000 students attended University 1’s main campus, where the writing center is located and whose students it largely serves. Nearly half of all enrolled students were Hispanic, and a similar percentage were low income. Among students, University 1 is known as a small institution that prides itself on providing students a sense of community and belonging. The institution prioritizes low faculty-student ratios and research experiences for students.

With regard to tutor development and training during the period under study, University 1 tutors received fundamental training regarding convergent and divergent questioning techniques, metacognition and concept mapping, rhetorical awareness and appeals, logical relationships in writing, and documentation styles in academia. At the beginning of the semester, all tutors received training in mindfulness, inclusivity, and facilitating productive sessions with emotional students.

University 2 is a selective, predominantly STEM-focused public university with a “very high research activity” Carnegie designation and almost 40,000 students enrolled in undergraduate and graduate degree programs. Over 70% of undergraduate students received some type of financial assistance in the year under study. The school is racially diverse, though African American and Latinx students are still underrepresented. In any given year, nearly 40% of students self-identify as first-generation college students. Among students, University 2 is known for academic stress, driven by the predominance of “weed-out” STEM academic cultures and the pace and pressure created by 10-week quarters. Students often reaffirm the university’s reputation as a place that offers little social connection.

During the period under study, the writing center at University 2 focused a portion of



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consultant training on issues of care. Boundary setting and balancing the needs of self and students were topics consultants discussed during staff meetings and trainings, which also hosted semiregular “care and share” staff sessions in which consultants discussed issues and experiences from sessions. No explicit training in mindfulness, body awareness, mindful breathing, and the like was provided.

### Stress and Anxiety Surveys

Tutors were asked to complete a set of surveys using Qualtrics, an online survey platform. All tutors completed a baseline survey, which recorded health history and current health status along with a validated inventory 10-item perceived stress scale (PSS), assessing stress in the last month (Cohen et al., 1983). For each tutoring appointment, the tutor completed pre- and post-tutoring session surveys with three components: (1) the State Trait Anxiety Inventory (STAI), a validated 4-point, 20-item preestablished questionnaire that measures anxiety levels (Spielberger, 2010); (2) researcher-developed questions about the tutoring session; and (3) “self-rated stress,” a measure developed by the research team that asked tutors to assess their current self-rated stress status, the stress of the student writer whom they had just tutored, and if they believed the stress or anxiety of the student writer had an influence on the tutoring session. Tutors were given 10 minutes between tutoring sessions to complete the postsession survey and to provide a saliva sample, which provided ample time while also minimizing the study’s impact on the availability of tutoring sessions in each writing center.

Participating student writers were asked to complete an informed consent form before the start of their tutoring appointment and were then given a brief online stress/anxiety survey using Qualtrics. In addition, student writers were asked their academic year standing, undergraduate student (first year, second year, third year, fourth year, fifth year, or beyond fifth year) or graduate student (master’s or doctoral) status, as well as when the writing project to be reviewed in the tutoring session was due (today, tomorrow, this week, next week, or other).

### Salivary Cortisol Sample Collection and Storage

Salivary cortisol levels were used to measure physiological indicators of stress in participating tutors. Salivary cortisol level represents a true value of free adrenal hormone output (Aschbacher et al., 2013), and saliva assays are sensitive and accurate without requiring a syringe or needle for blood sampling (Gozansky et al., 2005; Vining et al., 1983; Vining & McGinley, 1987). For all salivary cortisol measurements, tutors provided whole saliva by tilting their head forward, allowing the saliva to pool on the floor of the mouth, then passing the saliva through a short straw into a prelabeled polypropylene vial, after rinsing their mouth thoroughly with water 10 minutes prior to submitting the sample. Tutors were also asked not to eat within 30 minutes of sample collection; to reduce consumption of sugar, caffeine, and meat within 1–2 hours of sample collection; and to abstain from drinking alcohol within 12 hours of sample collection.

#### Morning Baseline

Cortisol levels vary among individuals or classes of people, but they generally follow a predictable diurnal pattern: a spike to their highest levels approximately 30 minutes after an individual wakes, followed by a steady decline throughout the day (Adam et al., 2017). To account for this diurnal cortisol slope, tutors provided fasting salivary cortisol samples in duplicate (on two different days) following initial waking in the morning (within 30 minutes).

#### Tutoring “Treatment” Samples

In order to measure the change in salivary cortisol corresponding with tutor/student writer interactions, tutor participants provided salivary samples just prior to the start of an eligible tutoring window (at the beginning of a shift); these cortisol samples served as the “Pre” values for the Treatment group. Tutor participants also provided salivary samples after each tutoring appointment during the window, which served as the “Post” values. In most cases, Post cortisol samples for the Treatment group were collected 30 minutes after Pre cortisol samples. Based on the natural diurnal cortisol slopes, it was expected that

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cortisol values would be higher at the beginning of the session and lower later in the day (Adam et al., 2017).

### Control Samples

In addition, tutors were asked to provide two salivary samples (Pre and Post) on a nontutoring day at the time of day corresponding to a tutoring shift being studied. On average, Post cortisol samples for the Control group were collected two hours after Pre cortisol samples. The purpose of adding the Control group was to obtain cortisol values to give the Treatment cortisol values on tutoring days comparative meaning. If tutoring sessions did not have an impact on tutors' stress, one would expect the cortisol patterns to be similar to those on the control days.

Baseline and control were transported by the participant to campus and delivered to their respective writing center, where they were stored at  $-20^{\circ}\text{C}$  until later processing. Samples from tutoring sessions were placed directly into the freezer on site after collection. Processing and analysis of samples was conducted at University 1; to transfer salivary samples from University 2, they were placed on ice and driven to University 1, where they were immediately stored at  $-20^{\circ}\text{C}$  until later processing.

### Immunoassays

Salivary samples were thawed and analyzed in duplicate using Salimetrics' expanded range high sensitivity (concentration range 0.012–3.0  $\mu\text{g}/\text{dL}$ ) enzyme-linked immunosorbent assay (ELISA), a kit specifically designed and validated for the quantitative measurement of salivary cortisol. The step-by-step procedures for saliva analysis can be found on the manufacturer's website. To validate the ELISA, determination of the intra- (3.33%) and interassay (3.33%) mean coefficients of variation were calculated across 8 salivary cortisol ELISA plates, which represents the consistency in the samples assessed. Values under 4% (intra) and 7% (inter) assays are considered acceptable (Hanneman et al., 2011).

### Statistical Analysis

All data were analyzed using the IBM Statistical Package for the Social Sciences (SPSS),

version 26. Summed data from both the stress (PSS) and anxiety (STAI) measures were included along with tutor and student writers' self-rated stress measures and all salivary cortisol values. Spearman rank-order correlation analyses were performed to examine the relationships between stress, anxiety, and cortisol measured at baseline and for all control and tutor sessions (which included information collected from tutors and student writers). Tutor and student writers' Pre-tutor session self-rated information was compared using a Mann-Whitney *U* test to assess for differences prior to starting the session. A linear regression analysis was performed to assess whether the Tutor 1 Pre (salivary cortisol on tutoring day session 1) significantly predicted the cortisol change scores (calculated from Tutor 1 Post – Tutor 1 Pre) (Ruengvirayudh & Brooks, 2016).

Finally, following previous research that grouped individuals by relative cortisol levels (see Aschbacher et al., 2013; Human et al., 2018), we divided tutors into two groups, one with elevated cortisol, the other with typical/low cortisol, using their pre-tutor session salivary cortisol values (elevated,  $> 0.200 \mu\text{g}/\text{dL}$  or typical/low,  $< 0.10 \mu\text{g}/\text{dL}$  levels). This allowed us to investigate the differences in distinctly stressed (elevated cortisol) or nonstressed (typical/low cortisol) tutors, to determine if prestress levels had an impact on the post-tutoring session stress levels and the tutors' perception of the session. Human, Henry, Jacobs, and Thomas (2018) grouped college-aged participants by mean (standard deviation) salivary cortisol levels as either "elevated"  $M = 0.202$  ( $SD = 0.137$ )  $\mu\text{g}/\text{dl}$  or "not"  $M = 0.061$  ( $SD = 0.075$ )  $\mu\text{g}/\text{dl}$  following their experimental day and compared STAI values based on those groups. The STAI mean and standard deviation for Human, Henry, Jacobs, and Thomas's groups was  $M = 42.35$  ( $SD = 12.02$ )  $\mu\text{g}/\text{dl}$ , very similar to our tutors' values, despite the differing protocols. This gives us confidence that sorting tutors into "elevated" or "not" groups was a valid approach for gathering more insight from the results. We compared the results of the elevated and the typical/low groups' responses to the Mann-Whitney *U* test's slide scale ratings (5-point scale, 0 = no influence to 5 = extreme influence) capturing the tutors' estimation of

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whether the student writers' stress and anxiety negatively influenced the quality of the session.

## Results and Discussion

Twenty-four student tutors consented to participate, and 21 completed the study ( $M = 21.05$  years,  $SD = 2.25$ ,  $n = 13$  female,  $n = 7$  male, and  $n = 1$  gender not identified,  $n = 7$  University 1 and  $n = 14$  University 2). The average length of employment (prior to participation in the study) as a tutor was  $M = 1.7$  ( $SD = 1.1$ ) years, range 0.5 to 5.0 years. Three student tutors did not complete the study; one participant had missing values on all control salivary cortisol samples, and two participants had many missing values on tutoring session salivary cortisol samples. A few tutors had a few missing STAI, tutor self-rated stress, or cortisol measures, but we included the rest of their data because they still permitted meaningful conclusions to be reached in the aggregate analysis.

Twenty-one student writers participated in the study (undergraduate,  $n = 20$  and graduate,  $n = 1$ ; identified as undergraduate first year,  $n = 5$ , undergraduate second year,  $n = 5$ , undergraduate third year,  $n = 3$ , undergraduate fourth year,  $n = 7$ , and graduate doctoral student,  $n = 1$ ).<sup>1</sup> Six students identified as Hispanic, Latino/a, or Mexican American; 1 as Black, 4 as Asian, 4 as White or Caucasian, and 6 as other or did not identify their race or ethnicity. When asked about when the tutoring appointment assignment was due, the following responses were provided by student writers: today,  $n = 1$ , tomorrow,  $n = 11$ , this week,  $n = 4$ , next week,  $n = 4$ , and other date,  $n = 1$ .

For tutor salivary cortisol (Table 1) and STAI survey data (Table 2), control samples across a typical tutoring session time (Pre, Post) and actual tutoring samples on day 1 ( $n = 18$ ) are provided as mean and standard deviation. Considering diurnal slopes for salivary cortisol, samples were collected from morning (9:30 a.m. to 11:59 a.m.,  $n = 2$ , midday to afternoon (12 p.m. to 3:59 p.m.,  $n = 13$ ) and in the

**Table 1.** Tutor Salivary Cortisol Values from Baseline, Control and the Tutor Session

Type of Group		Tutoring Day 1	
Baseline Salivary Cortisol (µg/dL)	All Tutors	0.547 (0.352) N=20	
	Tutors with elevated cortisol	0.617 (0.399) n=13	
	Tutors with typical/low cortisol	0.416 (0.209) n=7	
Type of Group		Pre Salivary Cortisol (µg/dL)	Post Salivary Cortisol (µg/dL)
Control (µg/dL)	All Tutors	0.302 (0.417), N = 20	0.384 (0.453), N = 20
	Tutors with elevated cortisol	0.414 (0.486), n = 13*	0.479 (0.511), n = 13
	Tutors with typical/low cortisol	0.094 (0.313), n = 7	0.206 (0.261), n = 7
Tutor Session 1 (µg/dL)	All Tutors	0.179 (0.117), N = 20	0.200 (0.171), N = 18
	Tutors with elevated cortisol	0.238 (0.101), n = 13**	0.236 (0.187), n = 13
	Tutors with typical/low cortisol	0.070 (0.045), n = 7	0.106 (0.065), n = 5

Note: Tutor salivary cortisol (mean and standard deviation in µg/dL) measured on control (nontutoring) and tutoring days for all tutors and then grouped by cortisol level (high versus typical/low) as measured on the tutoring day prior to the first tutoring session. \*Mann-Whitney U test results between tutors grouped by cortisol level for control ( $p < 0.07$ ) and \*\*pre tutor session ( $p < 0.05$ ).

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**Table 2.** Tutor Self-Rated Stress and Anxiety

Tutoring Session and Measure			Tutoring Day 1	
			Pre Session	Post Session
Control	STAI (Score, 0–80)	All Tutors	30.21 (10.23), N = 14	30.92 (12.44), N = 13
		Tutors with elevated cortisol	29.23 (12.20), n = 9	31.00 (15.20), n = 8
		Tutors with typical/low cortisol	31.90 (6.06), n = 5	30.80 (7.70), n = 5
Tutor Session 1	Tutor Self-Rated Stress (Score, 1–5)	All Tutors	2.20 (0.700), N = 19	2.21 (0.630), N = 18
		Tutors with elevated cortisol	2.00 (0.739), n = 12	2.18 (0.603), n = 11
		Tutors with typical/low cortisol	2.43 (0.535), n = 7	2.29 (0.756), n = 7
	STAI (Score, 0–80)	All Tutors	37.91 (7.65), N = 20	35.29 (6.53), N = 20
		Tutors with elevated cortisol	35.00 (8.28), n = 13*	33.46 (6.63), n = 13**
		Tutors with typical/low cortisol	42.86 (3.13), n = 7	38.00 (5.89), n = 7

Note: Tutor stress and anxiety (mean and standard deviation) as measured using a single-item 5-point scale prompts tutors to self-rate their stress (Self-Rated Stress) level ranging from 1 (least stress) to 5 (most stress) at that point in time and the STAI 4-point 20-item scale that measures anxiety levels (Spielberger, 2010). Data are presented for all tutors and then grouped by cortisol level (high versus typical/low) as measured on the tutoring day prior to the first tutoring session. \*Mann-Whitney U test results between tutors grouped by cortisol level for pre ( $p < 0.05$ ) and \*\*post tutor session ( $p < 0.08$ ).

evening (4 p.m. to 7:59 p.m.,  $n = 6$ ) in order to align with typical values seen previously based on time of day. Normative cortisol values in the morning for adult males (20–21 years) are 0.112–0.743  $\mu\text{g/dL}$ , and for adult females (20–21 years) are 0.272–1.348  $\mu\text{g/dL}$ , which shows how variable cortisol sampling can be in similar populations (Aardal & Holm, 1995).

### Self-Perceived Stress and Anxiety Survey Measures

Based on the survey results, student writers' mean self-rated stress was  $M = 3.1$  ( $SD = 0.97$ ) on a scale of 1–5, and when asked if the tutoring assignment contributed to their stress, they indicated  $M = 2.56$  ( $SD = 0.97$ ) on the same scale, which suggests that the assignment they brought to the tutoring session did not contribute to the student writers' self-perceived stress and anxiety. Results (mean, standard deviation, and mean rank) from the Mann-Whitney U Test show that the student writers' self-rated stress ( $M = 3.1$ ,  $SD = 0.97$ ,

$M\text{Rank } 25.78$ ) was significantly higher ( $p < 0.05$ ) than the tutors' self-rated stress ( $M = 2.2$ ,  $SD = 0.70$ ,  $M\text{Rank } 15.23$ ).

As a group, the studied tutors' baseline for perceived stress in the month preceding their participation in the study ( $M = 17.25$ ,  $SD = 4.68$ ) was within the normative range of 14.54 to 18.64 for that age group (Cohen & Janicki-Deverts, 2012). Those tutors whose perceived stress over the last month that was higher at baseline generally reported being more anxious (as determined by the STAI,  $r_s = .602$ ,  $p < .05$ ) and rated themselves as more stressed prior to their first studied tutoring session using the researcher-developed self-rated stress scale ( $r_s = .637$ ,  $p < .05$ ). It was these findings that led to our secondary analysis, dividing tutors based on their salivary cortisol values being elevated or typical/low and assessing the pre- to post-tutoring session findings, similar to Human, Henry, Jacobs, and Thomas (2018), as mentioned above. What we saw through this grouping is that tutors who were more stressed (measured by salivary cortisol) prior to their

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tutoring session remained stressed after the session ( $r_s = .480, p < .05, n = 18$ , Table 1). An increase in salivary cortisol values from pre to post for session 1 ( $M = 0.004, SD = 0.124$ ) was correlated with baseline values ( $r_s = .478, p < .05, n = 18$ ) and positively correlated with self-rated stress prior to the start of the session 1 ( $r_s = .583, p < .05, n = 17$ ). That is to say, tutors with greater initial salivary cortisol continued to manifest higher levels (both salivary cortisol and self-rated stress) after the first tutoring session. Those tutors who were more anxious prior to starting their tutoring session, indicated by the pre STAI score ( $r_s = -.467, p < .001, n = 21$ ), still perceived themselves as stressed after the session (change in self-rated stress score,  $M = -0.10, SD = 0.62$ ), and those with less anxiety at the start of the session were more likely to be less stressed after the session (change in anxiety), STAI score ( $r_s = -.469, p < .001, n = 21, M = -2.62, SD = 6.85$ ) following tutoring session 1.

Finally, a simple linear regression analysis was performed to test if Tutor 1 Pre salivary cortisol significantly predicted the change scores (calculated from Tutor 1 Post – Tutor 1 Pre). After removing one outlier, the results showed that Tutor 1 Pre explained 18.2% of the variance in the change scores ( $R^2 = .182$ , Adjusted  $R^2 = .127, F(1, 15) = 3.336, \beta = -.427, p = .088$ ). Tutor 1 Pre could be used to predict the change scores. They had a negative relationship. That is, the higher the Tutor 1 Pre, the lower the change scores.

No significant associations were found between the tutor-rated stress for student writers and any of the following tutor data: tutor self-rated stress measure, the change in tutor stress over the session, or the change in tutor anxiety over the session. In addition, we measured each respective tutor's level of experience as a writing tutor in our analysis (tutors ranged from having .5 year to 5 years of experience) and found no difference between the groups for years employed as a tutor. The relationships found between perceived stress/anxiety and tutoring had more to do with the stress or anxiety that individual tutors carry into their sessions than it did with any stress or anxiety caused by (or at least arising during) a tutoring session. While we entered the study

particularly interested in whether sessions with stressed student writers would cause an increase in tutor stress, no significant associations between tutors' self-reported stress, anxiety, and their perception of student writers' stress were found.

In sum: tutors who entered a tutoring shift or specific session with more stress or anxiety were more prone to experiencing stress/anxiety in tutoring. Those who were not already experiencing stress or anxiety did not, on average, see any increases in stress.

## Perceiving the Stress of Others

Another suggestive finding that is worth more study is the impact of stress on the ability of tutors to gauge student writers' stress. Tutors were divided into two groups based on their pre-tutor session salivary cortisol value, elevated ( $M = 0.238, SD = 0.101 \mu\text{g/dL}, n = 13$ ) levels, which indicates a greater emotional state and more stress or anxiety, and typical/low ( $M = 0.070, SD = 0.045 \mu\text{g/dL}, n = 7$ ) levels, which indicates less of an emotional state and lower stress and anxiety. Our data indicate that tutors with elevated salivary cortisol were statistically less likely ( $p < 0.05$ ) to perceive the stress and anxiety of their student writers (Figure 1;  $M = 1.4, SD = 0.70$  out of a 5-point scale) than those tutors with lower salivary cortisol (Figure 1;  $M = 2.5, SD = 0.84$  out of a 5-point scale).

Note: Participants were divided by cortisol level (high versus typical/low) as measured on the tutoring day prior to the first tutoring session (elevated,  $M = 0.238, SD = 0.101 \mu\text{g/dL}, n = 13$  or typical/low,  $M = 0.070, SD = 0.045 \mu\text{g/dL}, n = 7$ ). The graph depicts the significantly different ( $M = 1.4, SD = 0.70$  vs.  $2.5, SD = 0.840, p < 0.05$ ) slide scale ratings of tutor perception of how the student writer's stress and anxiety negatively influenced the quality of the session (5-point scale, 0 = no influence to 5 = extreme influence) and the student writer's mean self-rated stress (3.1 from a 5-point sliding scale).

## Limitations

The two universities at which the study was conducted have different conditions that cause



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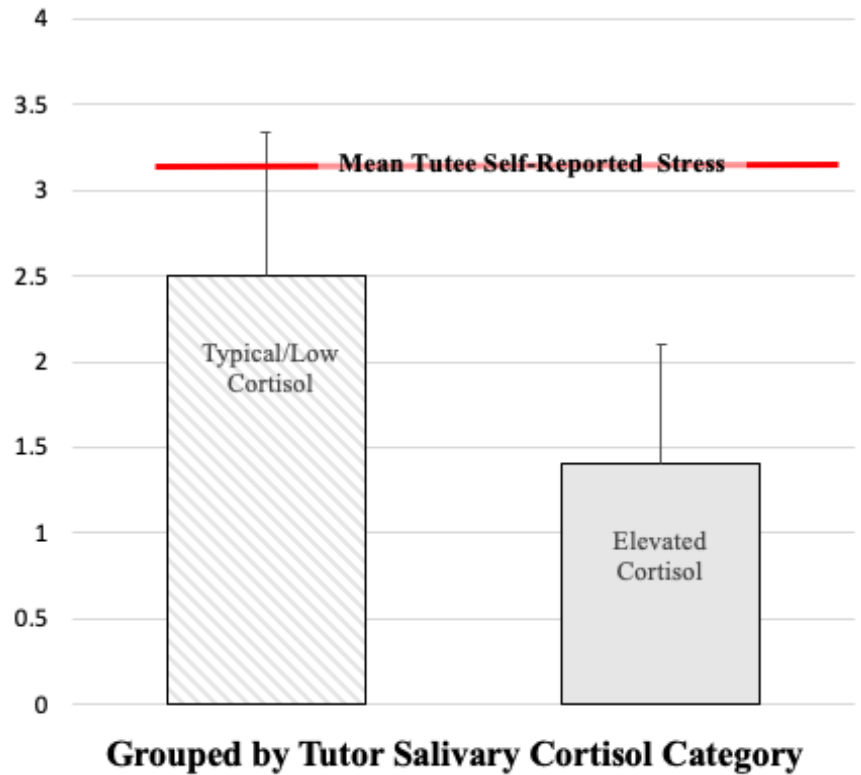
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**Tutor Perception of Tutee Stress and Anxiety**



**Figure 1.** Tutoring session ratings by tutor on student writers' stress and anxiety based on tutor pre-tutoring session salivary cortisol.

stress and anxiety for students. We did not control for these factors, nor did the timing of the study attempt to capture times of high stress for students. Data collection largely occurred in the spring quarter/semester—traditionally a time of lower usage at both schools' writing centers, and arguably a time of lower stress for students.

We designed the study with the intention of affecting the tutoring schedule or process as little as possible, leading to more external validity; the resulting low internal validity created some limitations. For example, the exact timing of all cortisol samples for each tutoring session followed the tutor's tutoring shift schedule and was not standardized. This added the variable time of day to our cortisol measurements. In addition, we decreased the number of validated measures from what we might have considered ideal in order to reduce the time required between sessions. We were sensitive to the fact that participation in the study could itself stimulate a stress response for tutors, so we wanted to decrease the time participating tutors had to spend on study activities between sessions.

We did not control for mental health status, menstrual cycle phase, steroid medication, or oral contraceptive, all which may have an influence on changes in cortisol levels during stressful situations. We also recommend that future studies measure the STAI and self-perceived stress at baseline and control points. Our data indicate that cortisol increases on nontutoring days, but we do not have survey information from tutors to explain the result. It is possible, in fact, that tutoring itself, as a help-giving behavior, is a source of relief from stress and anxiety.

The students who agreed to have their sessions included in the study and to complete the brief surveys about their stress/anxiety were a self-selecting group. It is possible that students feeling more stress and anxiety, in particular in relation to their writing, opted out of the study, which may have impacted the results.

But also, as a result of efforts to preserve the anonymity of participating tutors and students, we did not match students' self-perceived stress levels to their particular tutor's estimation of their stress. Researchers



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interested in how working with stressed students might impact tutors might close this gap to reach interesting new insights.

We also did not control for the relative enrollment levels (first year, junior, etc.) of the tutors and the student writers with whom they worked. It is possible that relative imbalances in the respective statuses had an impact on tutors' stress levels.

The number of participants in our study was too small to suggest anything about differences for stress related to tutors' minoritized or intersectional identities, but we would encourage future researchers to investigate this.

A final limitation to consider: As noted above, the tutor training at Universities 1 and 2 included sessions on self-care, objective feedback, and empowerment, as well as a general tone that tutors are supported by center directors and staff. Tutor training emphasized that students coming to the center were bringing complex emotions with them and provided tutors with tools for addressing them directly, though with some differences in the approach each center took and the degree of emphasis. This may have affected the collected data.

## Replicability

We would encourage writing center scholar-practitioners interested in replicating this kind of study to take heart and take heed; it is research you can undertake, but you will almost certainly need to build a team. The implementation challenges and time investments for a study like this are considerable: designing the study, undergoing an IRB process that covers the collection of biological samples, recruiting tutors to participate, detailing and disseminating the collection protocol, recruiting students with tutoring appointments to participate (a significant hurdle for increasing the  $n =$  of the study), collecting and storing salivary samples and surveys, and then breaking down the results through rigorous statistical analysis. For our study, the story is told in the list of co-authors and the range of their disciplines and credentials. Take it to suggest that the average writing center researcher will need the support of colleagues from across the disciplines

to undertake a study like this; STEM researchers, in our case a biologist and a physiologist, were essential for the design, execution, and analysis of the study. But to us, interdisciplinary collaboration is part of the point. Working with biologists, physiologists, and statisticians helped us flesh out a kernel of an inquiry into a robust empirical project, grounded in validated methodologies and instruments, and to think about its practical value for a vista beyond that of just writing center work.

The logistical challenges are also significant. We had a core team of dedicated undergraduate writing tutors who helped us train other tutor participants on the research protocol; who corralled salivary samples and ensured they were deposited into the freezer for storage; who connected with students coming in during tutoring shifts under study to recruit them to participate. (The benefits of having undergraduate writing tutors involved in this kind of research were significant, though, and relatively unique. At University 2, this study gave several of our peer tutors the opportunity to participate in research in a way unique from other lab or co-curricular research experiences, and almost all of those who participated, even just as part of our logistical support team, parlayed the experience, one for instance into a lab manager position at an elite university, another as part of a successful NSF GRFP application.)

To continue the logistical considerations, in terms of the salivary samples alone: While salivary cortisol assay kits exist on the market that allow a researcher to send samples to a lab for processing, they are cost prohibitive for a writing center undertaking a study of this size. On the other hand, while cheaper, the kits we used required BSL-2 laboratory facilities, lab skills, and expertise to process, plus proper sample storage before processing. This means you would also need to be prepared for the financial commitments this kind of research requires, which, at an amount above zero dollars, exceeds that of most writing center research. Our salivary assay kits were each \$250 and included a 90-well plate; each well holds one sample; and every participating tutor had at minimum six samples (a tutoring day baseline pre- and post-, a tutoring session pre- and post-, and a

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control pre- and post-). You could expect collection equipment (salivary tubes and swabs) to run you an additional \$500–\$1,000. To purchase outright the laboratory equipment (pipettes, tips, a spectrophotometer, etc.) needed for processing the collected samples would cost more than \$5,000, but you almost certainly wouldn't be budgeting for a lab when you propose this project. You'll want instead either to partner with someone who has access to these facilities (and the skills to use them), or to budget for contracting with a commercial lab to process the collected samples.

Another replication challenge that would be easy to overlook: In replicating or extending this study, you must recruit *students* willing to participate. To reach any  $n =$  of participating tutors, you must have at least as many students coming to your center for help with their writing—with all the complexities of affect that can accompany it—say yes to participating, and say yes to completing a short survey. You want to ensure that your protocol does as much as possible to make this a comfortable ask for them, and to consider and mitigate the ways a short survey on stress/anxiety might itself cause stress for some students.

Beyond these considerations, a researcher intending to replicate this study would face the problem in the promise of the results that are generated; for which, enter the statisticians. To give a sense of the scale of the complications: Our study required us to bring in an additional statistician, despite the fact that two of our primary authors have themselves authored a textbook on statistical analysis. The challenge of data analysis, and budgeting the time and person power it will require, should be something to explicitly (over-)estimate during your study's planning phase.

In all, our study took more than a year to design, implement, analyze, and complete.

## Conclusion

Stress is at best a crude stand-in for the wide range of emotional labor required of writing tutors. But we are convinced of the centrality of emotional labor in the work of writing tutors, and we feel that the current study shines light

in that direction by confirming how tutors can have complex relationships to their work in the center, and that those relations are mediated by their identities and experiences. Our data indicate the reality of stress in writing center tutoring, though in unexpected ways. Many of our findings challenge standard writing center lore about the affective dimension of the work that tutors do in sessions.

Our results in one way correspond with those of Simmons, Miller, Prendergast, and McGuigan (2020), in that most participating tutors' cortisol levels dropped during their tutoring shifts. This correspondence, though, is in many ways meaningless: As we noted earlier, Simmons, Miller, Prendergast, and McGuigan's (2020) study did not control for natural diurnal changes in cortisol levels—the expected fall over any daytime timeframe as part of the day's routine hormonal rhythm. Having controlled for this, and also baselined tutors' stress levels at corresponding times on nontutoring days, our study is able to reveal evidence for what Simmons, Miller, Prendergast, and McGuigan (2020) can only suggest: that for the majority of tutors, tutoring does not cause stress. We share their surprise at this; we had anticipated stress corresponding with tutoring, given the focus writing center training literature gives to managing student writers' stress, as well as the lived experience of hearing from and observing tutors. We had felt that, at a minimum, tutoring stressed students was stressful. While our measurements of students' self-perceived stress levels were unfortunately not matched to their particular tutor's estimation of their stress—a methodological oversight born of our procedures to preserve participants' anonymity, meaning we can't say anything definitive about how student writers' and tutors' cortisol levels may relate to one another causally—our data show that, in general, tutoring does not cause stress.

The findings do urge us, however, to consider how the emotional work of tutoring writing affects different members of our staff differently. Tutors who are already stressed or anxious are potentially prone to increased stress or anxiety from tutoring. If you're stressed, even run-of-the-mill sessions can be stressful.

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But the most striking implication to emerge from our data is that *stressed tutors are worse at perceiving the stress of the students with whom they are working*. It is a deduction we can make from aggregated data (see Figure 1). More stressed/anxious tutors were less accurate at estimating students' stress levels (if we compare the average of students' reported stress and the estimation of the same by tutors with elevated and typical/low cortisol levels, respectively) and also less likely to report that student writers' stress had an influence on the session, suggesting that stressed tutors are perhaps less able to perceive or respond to students' affective states. This deserves further research with a protocol that matches participating students' self-reported stress levels exactly with the corresponding tutor estimation of that stress and its impact on sessions. But these preliminary results have significant implications for writing center directors. Emotional labor is at the center of writing center work. Our tutors' empathetic fluency is something we rely on (which we point out while leaving aside a number of reservations and critiques of the implications, which are beyond the scope of this article to unpack). Indeed, the two most commonly expected outcomes of a session—satisfaction and self-efficacy—are *feelings*. Conditions that impair tutors' capacity to perform the emotional labor that largely defines the success of their work have implications for every center director. Tutors with dimmed capacities to recognize students' emotional states will be less likely to recognize and respond to students' emotional cues, presumably even those that signal comfort, confidence, or comprehension in a session. They will be less successful tutors.

In total, our study suggests that writing center directors should think more about how we can prepare peer tutors to notice and attend to their own stress, rather than focusing on managing student writers' stress. We should help tutors learn to recognize their stress levels and emotional states, and techniques for responding to them, as well as orienting them to the challenging emotional labor the job requires of them so that it's not invisible and unspoken (Nelson et al., 2020). We should create conditions for care in our policies and practices.

Prioritizing the well-being of your staff is a way of prioritizing their success with students.

## Note

1. While the writing center at University 2 did not allow graduate student writers to meet with undergraduate writing tutors, University 1 did; University 1's graduate students, who are largely enrolled in professional degree programs, often had the kinds of questions and concerns that undergraduate writing tutors were well prepared to answer. We did not include student enrollment level as a factor for analysis.

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