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Measuring Physiological Response to Communication Apprehension Using Heart Rate Intervals

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Project Title: Measuring Physiological Response to Communication Apprehension Using Heart Rate Intervals

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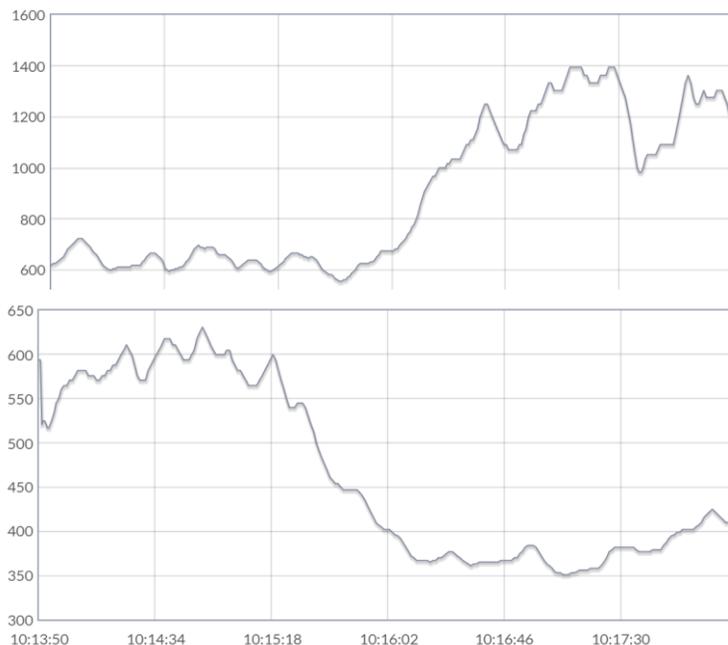
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Proposal Identifier: RCEU20-CM-CLL-01

Project Description:

Communication apprehension (CA), often described as public speaking anxiety or social anxiety depending on the context, is a huge issue for many people. CA is the internal state of heightened arousal that many individuals experience as they begin or even consider a stressful communication situation. CA can be trait based or situational. Situational CA becomes a problem when the speaker is unable to identify the causes for their fear and cope with it to communicate effectively. As new communication technologies are introduced into our personal and professional lives, it is important to update our understanding of CA and empirically test what treatments are most effective for helping us deal with situational communication apprehension.

In Summer 2020, the RCEU student will work on a series of existing research projects that use wrist based and chest based heart rate monitors to measure physiological responses to stressful communication situations. The heart rate monitors record participants Heart Rate Variability (HRV), a more accurate indicator of stress than average heart rate. When the autonomic nervous system is stressed, it pushes the heart to beat more consistently and enters the “fight or flight” response. As a result, a low RR-interval (reported in milliseconds) means the participant is more stressed. A fully relaxed person’s RR-interval will be above 1,000, but in the case of communication apprehension, the individual’s RR-interval can dip below 400. Please find an example of a comfortable speaker (top) compared to a stressed public speaker (bottom):



The comfortable speaker shows some nerves while waiting to deliver their speech, but their RR intervals quickly climb above 1,000 once the speech begins. A few minor dips indicate situational triggers for a few nervous moments.

In the bottom image, the speaker is similarly nervous while waiting to speak, but once they begin, their RR intervals drop to 350 to 410 milliseconds, showing extreme anxiety that harmed their performance.

The RCEU student will work with Dr. Lanius to compare the RR interval charts to the recorded speeches and communication situations to identify what triggered the stress response in participants. There are three studies using this methodology: a study of individual student speakers (Lanius), group presentations (Lanius, Connors), and student response to teachers inside and outside of their specialty (Sims, Connors, Lanius). While preliminary analysis has been done

on the first two studies, additional analysis is needed to complete the final journal articles. No analysis has yet been done on the third study of student response to teachers lecturing inside and outside of their PhD specialty. The RCEU student will help the collaboration wrap up the analysis and preparation of three journal articles tied to these three studies.

Before Summer 2020, Dr. Lanius and Dr. Lanius and Dr. Connors will have initial journal articles under consideration in *Communication Monographs* and *Communication Education*.

Specific Duties:

The RCEU Student will work directly with Dr. Lanius over the 10 week period in the eValuation and User Experience lab (CTC 125) on UAH's campus. Student will be expected to:

- Read R-R interval charts and create an excel spreadsheet with the participant's anonymized number, RR value, and the time of the score for each instance of major change either up or down in value.
- Watch the corresponding video recording to code in the spreadsheet what situational trigger occurred just before the change in RR interval score found from the RR chart.
- Work with Dr. Lanius to complete a statistical analysis of the results looking for patterns.
- Work with Dr. Lanius, Dr. Connors, and Dr. Simms to prepare manuscripts for submission to academic journals by the end of Summer 2020.

Tangible Contributions:

The student will assist in the data analysis and manuscript preparation of three journal articles for submission to academic journals. Additionally, the student will be encouraged to prepare a *Perpetua* submission and research poster about how closely RR interval data maps to the participants self-reported believes about their communication apprehension.

Specific Outcomes for the Student:

The student will learn about physiological measurement to understand human communication and behavior. They will also be exposed to higher order statistical analysis and manuscript preparation. This position is ideal for any student considering a Ph.D. or M.A. in Communication Studies, Psychology, or Sociology.

Student Selection Criteria:

Open to any student who has taken a human subjects research class in Communication Arts, Psychology, Sociology, or Kinesiology.

Faculty Mentorship

The student will work directly in the VUE lab with Dr. Lanius over the course of the summer. They will also be involved with bi-weekly writing meetings with Dr. Lanius, Dr. Ryan Connors (Kinesiology), and Dr. Jennifer Sims (Sociology).