Major Depressive Disorder (MDD) and Social Phobia (SP) are widespread mental disorders. As they often occur in individuals with high amounts of stress, MDD and SP are relevant issues to many Stanford students. Meghan Vinograd, a Junior in the Psychology Department, completed a research project on these two disorders. She hopes that her work will lead to better treatments for people with MDD and SP. In my interview with her she stated that “it’s really important so we can make people’s lives better.”

Last summer, Meghan investigated the physical experiences of patients with MDD and SP. She tested for differences in heart rate variability and heartbeat detection accuracy between participants with MDD and SP and those in a control group without the disorders. She said that according to previous studies, low heart rate variability is related to “mood disorders,…heart problems,…and increased likelihood of death following a heart attack.” In her study, Meghan hypothesized that participants with MDD would have a lower heart rate variability than controls and participants with SP. Other researchers had already identified an association between patients with depression and low heart rate variability, but Meghan’s experiment aimed to find the same result in a sample of individuals that clearly did not have any psychiatric comorbidities.

For heartbeat detection accuracy, previous studies suggest that anxiety is associated with an increased ability to detect one’s heartbeat. In accordance with the previous literature, she hypothesized that participants with SP would have a higher heartbeat detection accuracy than controls and participants with MDD.

In order to test her hypotheses, Meghan worked in the Stanford Mood and Anxiety Disorders Laboratory under the guidance of Ian Gotlib, Stanford Professor of Psychology, and graduate student Daniella Furman. Her sample included fifty-eight female participants: thirty control participants, seventeen participants with MDD, and eleven participants with SP.

To test for the participants’ heartbeat detection accuracy, research staff “hooked [the participants] up to an ECG machine.” She stated that “while the machine recorded their actual data, we had them count their heartbeats for thirty-five, twenty-five, and then forty-five seconds.” After this baseline period at rest, the participants exercised on a step machine, “stepping up and down.” The participants’ counted their heartbeats during this exercise phase. Then in a recovery phase, the participants sat down and counted their heartbeats again. By comparing the participants’ counts of their heartbeats to the machine-recorded data, Meghan calculated the participants’ heartbeat detection accuracy. She used the ECG data to calculate the “variability of the time in between [her participants’] heartbeats,” in order to calculate their

Within each stage of Meghan’s three stage experiment, the participants count their heartbeats for thirty-five, twenty-five, and forty-five seconds. The participants use a step machine to raise their heartbeats in the middle stage.
heart rate variability.

The data supported Meghan’s first hypothesis. She said that “MDD participants did show decreased heart rate variability at significant levels when compared [to] the SP participants and…the controls.”

As stated previously, past studies found that lower heart rate variability is associated with various psycho- and cardiac-related pathologies. Meghan’s experiment suggests that Major Depressive Disorder is related to decreased heart rate variability, and thus it may be a marker for mental and physical health problems.

Her data only partially supported her second hypothesis. Meghan said that “the SPs were significantly better at detecting their heartbeat than MDDs but not significantly better than controls.” One explanation for the inconclusive results is that the “sample size was only 58.” With a larger sample size, the data might show that SPs have higher heartbeat detection accuracy than controls. Her experiment thus may eventually extend the literature on introspective accuracy in social phobic individuals.

Interestingly, Meghan found that for both investigations into heart rate variability and heartbeat detection accuracy, “the differences were only found at the baseline period, so when they were just sitting and doing the counting task.” She is interested in exploring this phenomenon with further research.

In addition, Meghan wonders about “participants in the sample who have both MDD and SP.” For these specific co-morbid patients, she questions whether there would be “some sort of leveling out” or “something completely different going on” for their heart rate variability and heartbeat detection accuracy.

Thus far, Meghan has presented her research at the Psych Summer Poster Session. For her senior Honors thesis, she plans to research a related topic. She said: “I’m really interested in looking at pain perception; it’s related in the sense that how people perceive pain is similar to how one might perceive their heartbeat.”

Overall, Meghan enjoyed her research experience in psychology. She said: “Honestly, I am in love with psychology. I find it fascinating to figure out why people do the things they do.” The prospect of her research improving treatment for people with mental health disorders thrills Meghan. She adds: “That is why I love the Gotlib lab because it is the intersection of research and very practical implications.”

Meghan Vinograd is a Junior pursuing a major in Psychology. She plans to earn a Ph.D. in clinical psychology. With her degree she wants to work in hospitals with children suffering from chronic illnesses and teach at the University level. Raised in Palo Alto, she is an avid Stanford sports and San Francisco Giants fan.