

up- or down-regulated in response to nematode infection. Resistance pathways will be matched to well-known pathways in model organisms such as *Arabidopsis thaliana* using gene ontology analysis. These pathways will also be explored using a mutual-rank co-expression analysis, which will detect gene clusters with similar expression patterns post-nematode infection. The findings from this study could reveal important stress response mechanisms in tomatoes, which could lead to the improvement of *Meloidogyne* crop resistance and begin to address issues with global food security.

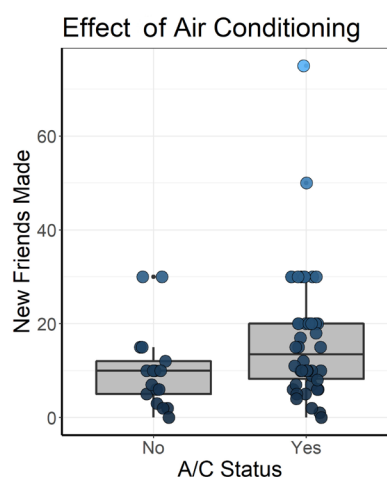
Research advisor Chao Cai writes: “Chingyan’s work identifying genetic pathways in tomatoes for resisting nematode infection will provide a comprehensive analysis synthesizing current evidence. The project will provide a better prediction of genes that are crucial for nematode resistance in tomato plants, which will help with the development of more efficient and environmentally friendly pest management strategies.”

Does Having Air Conditioning Affect Friendship Formation in the First Two Months of College?

Student researcher: Zachariah Hunt, Senior

Dorms lacking air conditioning are commonly touted as having a closer community because residents must keep their doors open to increase air flow. This would suggest that dorms without air conditioning would be more conducive to developing friendships. However, empirical studies on the subject were lacking. We administered two surveys to incoming students; one at the beginning of the semester, and the other two months in. We compared data from students in residence halls with air conditioning to data from students in residence halls without air conditioning. Sixty-three participants answered both surveys’ questions about the number of friendships formed and their residence hall, and completed a brief personality inventory.

We found that, on average, students in residence halls with air conditioning reported making more friends than their counterparts without air conditioning: $t(45.067) = 2.2947$, $p = 0.02646$. This discrepancy cannot be attributed to a difference in extroversion between the two groups because this was nonsignificant: $t(23.899) = -1.6846$, $p = 0.1051$. However, there were 2 participants in the air conditioning



A/C status vs new friends made. Notice the two significant outliers in the A/C Yes column.

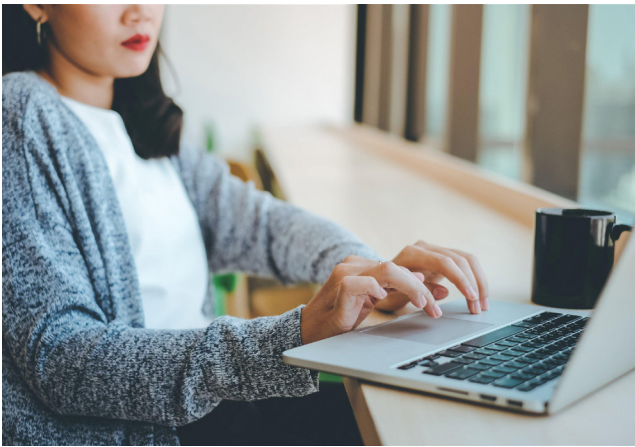
group who reported a number of friendships made that was 10 times the values of most other participants. When these two were excluded from the analysis, the effect of air conditioning became nonsignificant: $t(30.708) = 1.8217$, $p = 0.07825$. Air conditioning may affect friendship formation, but our sample size was too small to be conclusive, and further research is needed.

Research advisor Alexander Francis writes: “Zachariah’s project developed out of his personal interest and experiences as a resident assistant. He used a pre/post survey approach to test conventional wisdom about how air conditioning affects friendship formation in the first few months of college. It was a lot of fun to work on, and we came up with what I think are some unexpected results.”

The Impact of Accessible Data on Cyberstalking

Student researcher: Elise Kwan, Sophomore

The continued advancement of technology and its new functions on both electronic devices and various social media platforms has unfortunately paved a new way for abusers to engage in cyberstalking, domestic abuse, and continued monitoring of partners without consent. Currently, there are programs and algorithms developed for the sake of helping potential interpersonal violence victims recognize digital abuse behaviors. Digital abuse types include cyberstalking, sextortion, nonconsensual pornography, and doxing. In sextortion, an individual will continue to bother another individual until they



Author Elise Kwan hard at work researching.

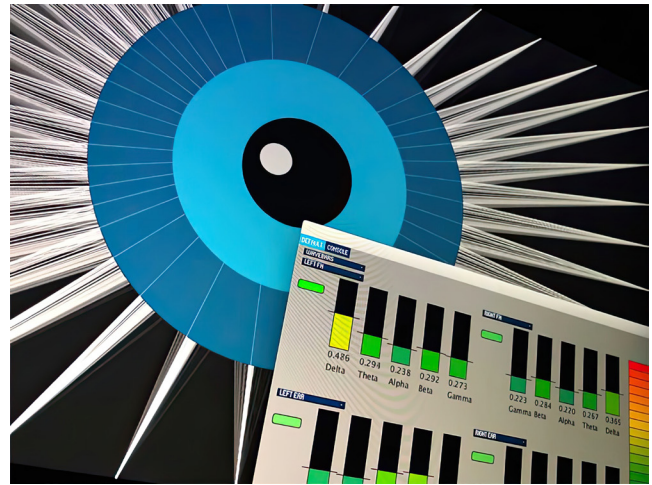
agree to do sexual acts. A harasser can continuously message and call someone until they agree to provide sexual favors or send sexual images. Nonconsensual pornography elaborates on sextortion: Filmed sexual acts are sent to others without the consent of all participating parties. There is a way to measure online interpersonal surveillance and recognize early on if a partner is starting to develop abnormal behaviors. This is known as the measure of attention of an OSN, which can be presented as a genuine solvable problem in terms of an analysis of social networks. Another program that has been proposed is the Account Reachability Checker, shortened to ARChecker. This program shows users how accessible the information on their social media accounts is for cyberstalkers who wish to obtain it. Using these programs can prevent digital abuse from getting out of hand, as well as give victims the necessary information to recognize important signs regarding abusive tendencies and unprotected information.

Research advisor Kendall Roark writes: “Elise Kwan’s research focuses on gendered power dimensions of surveillance capitalism within a human rights framework. In this project, she situates tools for limiting interpersonal surveillance at the consumer level within the context of international technology policy.”

NeuroArt: Presenting a Tool for Self-Regulation

Student researcher: Emma Niecikowski, Sophomore

The art of self-regulation is a key concept in meditation and useful for everyday application, as it reflects one’s



The Focus app captures brainwave data as seen in the control panel in the right corner. Brain signals are translated into a visual image that changes in real time. This is an example of the neurofeedback imagery with its white dot and other visual cues. Focus app and control panel (detail), 2020 © Petronio Bendito and Tim Korb. Used with permission.

ability to manage their emotional state and consequently brain activity. Through the creation of the Calm and Focus apps, Dr. Petronio Bendito and Dr. Tim Korb present two neurofeedback visual tools for users to gauge their brain activity and practice to optimize their results to achieve calm and focus. Users wear an electroencephalogram (EEG) and its electrodes capture alpha, beta, gamma, and delta brain waves and send them to the app to display the signals visually as an art form. The Focus app shows a dot that moves to the center of the screen as brain activity symmetry is achieved, and the Calm app displays color gradients that shift from warm to cool tones as brain activity lowers. Recently, the interactive NeuroArt project was presented at Chulalongkorn University (Thailand) and users learned methods that promote self-regulation, including stretching and restful awareness. Promoting positive self-regulation methods is integral to health, and using these apps is advantageous as it allows monitoring of brain function in real time. NeuroArt is a growing discipline that allows neurological disciplines to become more accessible and enjoyable and paves the way for future health care endeavors. It is difficult for a layperson to understand medical jargon and interpret brainwave data, but the Calm and Focus apps display brain signals aesthetically, in a visual and metaphorical way, so they become comprehensible across all languages and speaking levels.