Dreaming of death: Dream content as a source of existential protection following mortality awareness

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According to Terror Management Theory, when confronted with reminders of death, we engage in a number of defenses that push existential anxiety out of our conscious awareness. However, this does not completely remove the threat as we engage in additional, unconscious defenses associated with self-esteem striving, worldview defense, and relationship management that largely influence conscious thought and behavior in both subtle and explicit ways. Although the unconscious landscape is difficult to measure, dream content can provide insight into this construct. The current project seeks to examine dream content following reminders of death. Overall, we hypothesize that when subtly reminded of death prior to sleep, individuals will be more likely to dream compared to a control group that did not experience the existential threat. Additionally, the content of that dream will more closely align with traditional terror management defenses including self-esteem striving, worldview defense, and close relationship maintenance. Thus, the current project seeks to provide a novel strategy to understand our existential defense mechanisms.

An examination of endocrine disruptors in Appalachian waterways on Danio rerio neurocircuitry

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The waterways of Southwest Virginia are vital lifelines for these rural communities not only as sources of water, but also as sources of food, recreation, and revenue. These same waterways have been misused and polluted through practices such as coal and mountaintop removal mining, fracking, straight piping (where raw sewage is emptied directly into the waterway), and other practices that introduce harmful waste into these waters. One group of chemical contaminants found in these waters are endocrine disrupting chemicals (EDCs). These chemicals can interfere with hormones in the body that control important processes, such as growth and reproduction. To address this issue, we intend to not only measure the levels of EDCs present in local waters, but also to use zebrafish, a model organism, to show how these EDCs can affect dopamine signaling in the brain. We will also incorporate students into this research by pairing it with classwork and allowing students to study changes in the development and behavior of the zebrafish exposed to various EDCs as they grow. Through this approach, we hope to not only identify significant problems posed by the EDCs observed in these waterways, but also to allow students to get real hands-on research experience during their regular coursework.

The Role of Personal Relevance in Predicting Eyewitness Recognition Accuracy

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Evidence from the verbal memory literature suggests that personal relevance causes information to be more memorable, and our interest was in whether it similarly facilitates memory among eyewitnesses of crimes. Participants in the proposed study will view a video of a mock crime, and then complete surveys measuring variables that might make the viewed crime particularly relevant to them, including empathy for the victim and personal exposure to violence. The hypothesis is that these variables, either collectively or individually, will predict eyewitness recognition confidence and/or accuracy. In addition to elucidating the basic nature of eyewitness recognition, such a finding might also lead to the development of screening surveys that can be given to potential eyewitnesses to estimate the credibility of their testimony.

Modeling of genetic and environmental factors shaping phenotypes in the seizure-prone bang-sensitive fly mutant

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Epilepsy affects ~4 million people in the United States. While severity varies, many cases are classified as drug-resistant with as many as 1.4 million people with no reasonable therapeutic avenue. Treatment strategies are further complicated by the complex genetic and environmental interactions underlying disease symptoms. To better understand the relationship between genetic predisposition to epilepsy and environmental insults this work uses a known seizure mutant, *bang-sensitive (bas)*, to explore how seizure severity interacts with copper exposure in the fruit fly Drosophila melanogaster. Copper is a common mineral associated with seizure activity that can find its way into water sources serving as a potential environmental insult contributing to epilepsy. This project seeks to investigate how copper exposure contributes to seizure behavior, define the role of *bang-sensitive (bas)* in seizure prevention, and lay the groundwork for further studies that can use the mechanisms described here for therapeutic benefit.