

**Abstracts by McNair Scholars
at the University of Oregon**

**Flexibility and Stability
in a Task-Switching Paradigm**

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A common method to assess executive control is the task-switching paradigm. It is well known that reaction times are longer when subjects switch tasks compared to when the same task is performed over consecutive trials. This reduction in performance when flexibility is required is referred to as a switch cost. It is not well understood how switch costs are influenced by a rapidly changing environment that sometimes demands more flexibility (i.e., more switching) and other times requires more stability and resistance to distracting information. Prior research using between-subjects designs suggests that people can indeed adapt to a more flexible or stable state depending on switch rate. Unlike previous research, the current paper investigates how low and high switch-rate conditions influence the tendency to adopt a flexible or stable state as a within-subject manipulation. Results indicate that people can quickly adapt their behavior to meet the demands of both flexibility and stability in a sample of college students.

Passive Carryover and Conflict Triggered Regulation: Differences in Early Visual Components

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Our cognitive system has the ability to adapt control settings to fit current task demands. One example of this is the conflict adaptation effect, which is the reduced response time-cost shown in a set of conflict trials that follows an earlier set of conflict trials. A previous study used participants' fixations on distractors to show that high levels of *experienced* conflict in trial $n-1$ led to a diminished conflict effect in trial n . Given the importance of *experienced* conflict and the involvement of the $N2pc$ event-related potential (ERP) in distractor suppression, we plan to conduct an electroencephalography to explore the $N2pc$ response and to measure participants' experience of conflict by using a traditional response-conflict task.

Pioneers of Planning: An Urban Planning Analysis of the Castro since 1985

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By focusing on the urban-planning practices of the Castro district in San Francisco, my research explores how urban planners began to include the Castro into their urban-planning practices as a recognized gay community. That process began after the election of Harvey Milk, the first openly gay person to be elected into public office in California. Beyond the history of gay rights, the story of the Castro is under researched. From a perspective of urban planning and analysis, the relationship between community housing, the aids epidemic, and continuing homophobia offers a narrative of the gay community's resilience. Texts by Castell, Godfrey, and Boyd recount the urban development of San Francisco's various ethnic and sexual communities. Important sources of documentary information were the San Francisco Library History Room, the James C. Hormel LGBTQIA Center, and the Bancroft Library in Berkeley. My research reveals that even after Harvey Milk, the Castro faced governmental oppression not only because of homophobia but also because of the aids epidemic of the 1980s-1990s. The Daughters of Bilitis helped the process of planning and organizing in the Castro, but not until the mid-1990s was an urban planning organization for the Castro founded—the Castro Area Planning and Action.

Age Differences in a “Short Long-term Memory” System for Visual Information

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Age differences in memory are particularly pronounced when there is opportunity to actively consolidate and elaborate information during encoding. Endress and Potter (2014) developed a paradigm to assess memory for non-consolidated/non-elaborated information by testing recognition for visual objects that were presented at a very rapid pace (i.e., 4 objects per second). Younger adults exhibited a surprisingly large capacity for this type of information, correctly identifying 70-80% of images. Performance declined when the same set of images was used across trials, suggesting that some elaboration is required to counteract proactive interference. If age-related differences are due to elaboration, we expect no age differences in the low-interference condition but emerging age differences in the high-interference condition. We compared 30 college students to 30 older adults, aged 65-80, using the Endress and Potter paradigm. Initial results suggest a striking absence of age differences in the low-interference condition, but—surprisingly—also no age differences in the high-interference condition.

Markers of Cardiovascular Health in Chronic Marijuana Smokers

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Chronic tobacco smoking is known to decrease cardiovascular health, but the long-term effects of chronic marijuana smoking have not been well studied in humans. Although the chemical cocktail in each type of smoke differs, there are many common factors, such as hot particulates and polycyclic aromatic hydrocarbons, that increase the risk of cardiovascular disease. Thus, the cardiovascular health of tobacco and marijuana smokers may be similarly impaired. However, recent studies of marijuana smoke suggest possible cardiovascular protective properties. Therefore, the purpose of this research is to examine markers of cardiovascular health in marijuana smokers in comparison with tobacco smokers and non-users. We expect to find decreased cardiovascular function and increased cardiovascular risk in marijuana smokers, but not to the extent of tobacco smokers.

Sequelae of Maternal Trauma: Attachment Relationships and the Development of Empathy in the Next Generation

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Mothers with trauma and adverse mental health histories are at risk for not accurately interpreting their infants' emotional bids and responding to their children in frightened or frightening ways. This contributes to attachment disturbances, and, potentially, to problems in the child's own development of empathy. Surprisingly, few studies have examined how child empathy develops within the context of the primary attachment relationship or how maternal trauma and depression contribute to individual differences in children's development of empathy. The current study originated with two central aims: (1) to determine whether infants' displays of empathy differ according to the quality of their attachment; and (2) to explore the extent to which maternal trauma and depression contribute to these differences. Thus, this study seeks to advance our understanding of how maternal characteristics impact children's empathy within the attachment context and to identify the mechanism(s) by which the capacity for empathy is transmitted across generations.

Fluid Borders, Neo-Liberal Displacements: Current Push and Pull Factors Driving Latin American Migration

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An estimated 12 million undocumented migrants live in the United States, a number that continues to increase because of state-sanctioned violence, extreme poverty, and exploitation in the wake of US involvement in Latin America during the last 75 years. A new strategy has been deployed by Latino migrants over the last few years that involves surrendering themselves at the border seeking asylum in lieu of attempting to cross illegally. Once the migrants have been taken into custody, they are released in the U.S. pending a federal asylum hearing. While awaiting their hearings, these migrants are in a state of flux, attempting to navigate this grey area, being *documented* undocumented immigrants. A grounded theory approach using qualitative interviews with undocumented immigrants currently in custody and informal interviews with ICE agents will attempt to shed light on this new status of being a *documented* undocumented immigrant. The project explores whether this new shift in migration status while awaiting trial helps navigate the asylum process.

Leafcutter Ants Inside the Nest Have Sharper Mandibles than Ants Outside the Nest

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Mandibular wear has a strong impact on leafcutter behavior and energetics. We report that the mandibles of ants outside the nest have higher wear on average than the mandibles of ants inside the nest by a factor of 2.14 ($p = 5E-18$). 95% of ants found outside the nest had wear that was more than .025 mm, and 70% of ants found inside the nest had wear that was less than .025 mm. This wear difference between ants inside the nest and outside the nest may indicate that ants do not go outside of the nest until their mandibles have worn, and that ants with the sharpest mandibles stay in the nest where most of the cutting occurs.

Feelings of Belonging and Future Persistence in STEM

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The present research explores two variables that may contribute to women's underrepresentation in STEM fields: low feelings of belonging in STEM fields and aversion to the "science nerd" stereotype. Ninety-eight dyads composed of graduate and undergraduate students from the same STEM field held 10-minute video-recorded conversations about graduate school. Undergraduate students with an interest in graduate study in a STEM field asked questions of current STEM graduate students who offered feedback about grad school preparation. After the interaction, undergraduate students completed questionnaires about their feelings of belonging in STEM and intentions to pursue graduate study in STEM. We also coded the conversations and rated how well each graduate student fit the "science nerd" stereotype. We predicted that undergraduates who reported lower feelings of belonging in STEM and who interacted with more "nerdy" graduate students would report lower motivation to persist in STEM fields. Additionally, we predicted that the lowered motivation would be especially true for female undergraduates. Results indicated that there was no significant difference between male and female undergraduates' feelings of belonging and future persistence in their STEM field. Also, we found that being paired with a "nerdy" graduate student was not a significant predictor of an undergraduate's future persistence in STEM. However, feelings of belonging, regardless of gender, may be related to decisions to persist in STEM fields.

Transfer of Fungal Endophytes from Leaves to Woody Substrates

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Fungal endophytes have been found in all plants surveyed to date, yet for many fungi the function of endophytism is still unknown. The Foraging Ascomycete Hypothesis (FAH) proposes that saprotrophic fungi utilize an endophytic stage in leaves to modify dispersal. Under this hypothesis, leaves can provide food and water during time of environmental scarcity, and they can transport the fungi to other substrates upon dehiscence. If the FAH is accurate, then some endophytes should have the ability to colonize saprobic substrates directly from a leaf-endophyte stage, though this has been little studied. To assess this ability, twelve surface-sterilized leaves of a tropical tree (*Nectandra lineatifolia* Mez) were placed directly on wood and incubated for six weeks. Fungi from the wood were subsequently cultured and identified by ITS sequences or morphology. 477 fungal isolates comprising 26 OTUs were cultured from the wood, the majority of which belong to saprotrophic genera (70.8% of OTUs, 82.3% of isolates). The mean OTU richness per leaf was 5.67. The term *viaphyte* (literally, “by way of plant”) has been introduced and defined as fungi that colonize living leaves as endophytes and use the leaves to transfer to another substrate, such as wood, when the leaves dehiscence. These results support the Foraging Ascomycete Hypothesis and expose the possibility that viaphytism plays a significant role in the dispersal of fungal saprotrophs.

Identifying Genes Required for *Caenorhabditis Elegans* Embryonic Morphogenesis

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Morphogenesis is one of three fundamental aspects of developmental biology concerned with shaping tissues into organs and forming the bodies of organisms. Defects in morphogenesis can cause a number of developmental abnormalities in humans that can be disfiguring or lead to death. The cytoskeleton and cell adhesion are instrumental to cell shape changes and movement, but their regulation is only partially understood. *Caenorhabditis elegans* is a powerful morphogenetic model that can provide new insight to improve our understanding of this vital biological process. The Bowerman Lab has generated a large collection of ~1000 temperature-sensitive (TS), embryonic-lethal mutants to study embryonic development, including morphogenesis. The TS mutants are useful tools because they can bypasses earlier essential requirements for genes. By performing forward genetic screens to identify TS morphogenetic mutants in essential genes, I have identified mutations in two conserved genes, *rib-1* and *emb-4*. The former functions as a putative N-acetylglucosamine (GlcNAc) transferase gene, and the latter is likely important for regulating transcription. These two genes will be important tools for future investigations into cell shape changes and migration required for embryonic morphogenesis in *C. elegans* that, in turn, will improve our understanding of developmental abnormalities in humans.

Increasing the Efficiency of a Biotin-Streptavidin Pull Down for An Investigation of Pt(II)-Protein Interactions

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Platinum(II)-based chemotherapeutics such as cisplatin are utilized across a broad range of anti-cancer treatments. The accepted model for cisplatin's signaling of cell death is through DNA binding interactions, though recent findings have shown that cisplatin can induce cell death through stress in the endoplasmic reticulum (ER). Pt(II) may induce ER stress by binding to essential ER proteins such as protein-folding chaperones. This study seeks to identify the proteins that Pt(II) binds by using the copper catalyzed 1,3 dipolar cycloaddition, or click reaction, to label targeted proteins with biotin post-treatment. We show that by denaturing proteins prior to click and digesting the platinated proteins before introducing streptavidin for pull-down, the resultant biotin-tagged peptides will be more likely to be bound by streptavidin, and the non-specific binding elements will be greatly decreased. This protocol will greatly increase the yield and specificity of platinated protein pull-down assays.

**Indigenizing Kalihi:
Imagining Native Solidarities between
Native Hawaiians and Working-Class
Filipinos in the U.S. Colony of Hawai'i**

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Kalihi, Hawai'i, an urbanized home to a working-class immigrant community of Filipinos, holds stories of anger, frustration, and sorrow about the forced economic displacement to Hawai'i from the Philippines. Kalihi also holds the stories of struggle and perseverance of people residing in that ghettoized area. Filipinos in Kalihi build solidarity around the shared stories and develop a collective connection to that particular place. Using a "storied place" framework, I examine those connections and explore how Kalihi Filipinos stories of place obscure Native Hawaiians' indigenous connection to Hawai'i. That examination may also reveal how Filipino settler stories unwittingly contribute to Hawai'i's colonial multicultural narrative that makes it difficult for Kalihi Filipinos to build solidarity with Native Hawaiians in their struggle against the United States' illegal occupation of Hawaiian lands. By connecting Filipino stories of displacement to those of Native Hawaiians, this research may reveal the significance of the Filipino role in combatting settler colonialism in Hawai'i and help to advance the Native Hawaiian sovereignty movement.