



Undergraduate Research Symposium **May 17, 2019 Mary Gates Hall**

Online Proceedings

SESSION 1F

IDENTITY AND DIFFERENCE IN THE CONTEMPORARY MOMENT

Session Moderator: Ralina Joseph, Communication
MGH 234

12:30 PM to 2:15 PM

* Note: Titles in order of presentation.

Using a Continuous Measure to Study Children’s Gender Identity

Deja Leigh Edwards, Senior; Anthropology: Medical Anth & Global Hlth

Mary Gates Scholar

Mentor: Kristina Olson, Psychology

Mentor: Selin Gulgoz, Psychology

Research has shown transgender children respond similarly to categorical measures of gender identity as their gender-matched cisgender peers, rather than those who share their sex assigned at birth. However, categorical measures may be limiting responses and not encompassing the diversity of gender identities. We presented a continuous measure to 223 transgender children (socially-transitioned children to live and present as a gender opposite the one assigned at birth), 71 gender nonconforming children (children who have not socially transitioned but show characteristics stereotypically associated with a gender other than the one assigned at birth), 281 cisgender control participants, and 181 cisgender siblings of transgender and gender nonconforming participants. Provided a line, participants were asked to mark their gender identity, with the left-most end indicating feeling completely like a boy, the right-most end indicating feeling completely like a girl, and in between representing varying degrees of a mixture of both. Each participant’s mark was converted to a percentage, with 100% indicating feeling completely like the gender they present as (for transgender/gender nonconforming children, opposite the gender assigned at birth). A univariate ANOVA examining the effect of participant group on identity showed a significant main effect, $F(3,752)= 38.72, p < .001$. Post-hoc Tukey comparisons showed, consistent with previous research, transgender children ($M=0.81, SD= .189$) did not differ significantly from the cisgender controls ($M=0.87, SD= .181$), nor cisgender siblings ($M=0.87, SD=.206$), in their identification with their

current gender. However, gender nonconforming participants ($M= 0.59, SD = .309$) differed significantly in their scores from each of the other groups ($ps < .001$). These results are consistent with previous research conducted with categorical measures. Additionally, as none of the groups showed 100% binary identification, this study also demonstrates the importance of continuous measures of gender identity within gender development research.

POSTER SESSION 2

Commons West, Easel 8

1:00 PM to 2:30 PM

Analysis of Oral Swabs for Universal Bacterial 16s rDNA to Optimize Diagnostic Application

Divya Naidoo, Senior; Public Health-Global Health

Mentor: Gerard Cangelosi, Environmental and Occupational Health Sciences

Mentor: Rachel Wood, Department of Environmental & Occupational Health Sciences

Mentor: Alaina Olson, Environmental and Occupational Health

Oral swab analysis (OSA) is a possible alternative sample type for tuberculosis diagnostics. It has been observed that tongue swabs contain greater amounts of *Mycobacterium tuberculosis* DNA than cheek swabs ($p<0.0001$) from tuberculosis patients. After determining that oral microbiota follows this same pattern, several factors including time-of-day swabbed and health status were analyzed to understand factors affecting the amount of bacteria on the tongue. This project aims to optimize the oral swab sampling methods in order to facilitate more sensitive diagnostic tests, using universal bacterial 16s rDNA as a proxy for *Mtb* DNA. Previously tested samples from South Africa were further analyzed to investigate amount of oral microbiota by day collected, HIV status, health status, and other demographic factors. To evaluate whether collecting multiple swabs per sample yielded more universal bacterial DNA, tongue swabs were taken from healthy volunteers in Seattle. Each subject provided a 1-swab sample and a 3-swab sample, which was then extracted and analyzed by a previously optimized universal bacterial PCR. Additionally, tongue scrapers are being assessed as an alternative to oral swabs. Swabs collected early in the morning had more bacterial DNA than swabs collected later ($p<0.03$). 3-swab samples yielded an average of 2-fold

greater amounts of bacterial DNA than 1-swab samples. Bacterial biomass correlated with *M. tuberculosis* signal in most comparisons. Bacterial biomass may serve as a useful proxy when developing better oral swab sampling strategies for TB diagnosis.

POSTER SESSION 2

Balcony, Easel 115

1:00 PM to 2:30 PM

Efficacy of Immunotherapy in Merkel Cell Carcinoma Patients with Concurrent Chronic Lymphocytic Leukemia

*Lauren Zawacki, Senior, Public Health-Global Health
UW Honors Program*

Mentor: Paul Nghiem, Dermatology

Mentor: Kristina Lachance, Medicine, Dermatology

Merkel cell carcinoma (MCC) is a rare and aggressive cutaneous malignancy with a high propensity for recurrence and distant metastasis. Individuals with chronic immunosuppression have both a higher predilection towards developing MCC and tend to have a more aggressive disease course. Chronic lymphocytic leukemia (CLL) is among the most common types of immunosuppression associated with MCC. Immune-checkpoint inhibitors (such as anti-PD1 or anti PD-L1 therapies recently approved for cancer treatment) are associated with improved disease-specific survival and are often used to treat patients with progressive, metastatic MCC. However, the effectiveness and side-effect profile associated with treating metastatic MCC in CLL patients with immunotherapy is not well categorized. This study seeks to understand the risk-benefit profile of immunotherapy in this setting, and a possible combined role for radiation in the treatment of CLL patients. Data was abstracted from a Seattle-based prospective registry of 1,439 MCC patients in which 9 patients were identified to have had CLL and been treated with immunotherapy. Patients were assessed for side effects of immunotherapy, progression of disease and survival status. Six patients had side effects from immunotherapy with 5 of the patients having side effects that resulted in termination of treatment. The average number of doses of immunotherapy received before termination was 3. Eight patients had progressive disease after the initiation of immunotherapy, 4 of whom have died of progressive MCC. No patients have had a complete and ongoing response to immunotherapy. These findings suggest that despite the efficacy of immunotherapy in immune-competent MCC patients, this approach may be less effective in CLL patients than immunocompetent patients. In addition, the side effect profile seemed to be more frequent in CLL-MCC patients. Neutron radiation and combination therapy are discussed as potential treatment options. Further investigation into treatment options for MCC patients with immunosuppression, such as CLL, is needed.

POSTER SESSION 2

Commons East, Easel 75

1:00 PM to 2:30 PM

Analysis of Ride Share Bike Bacterial Load at Key Locations in Seattle

*Andy Le, Recent Graduate, Pre-PT, South Seattle College
Victoria Flores*

Quan Nguyen

Juan Sanchez

Mentor: Henry Olson, Biology, South Seattle College

Bacteria can colonize many types of surfaces if those areas have the necessities for survival; these surfaces can act as a shared point of contact for the potential spread of diseases. A prime example lies on the handles of the immensely popular ride share bicycles in Seattle. By swabbing from the handles of bikes in different public locations across Seattle, we can assess the bacterial load. We examined the extent of bacterial colonization on bike handles at light rail stations, dog parks and different neighborhoods at different times of the day. This analysis highlights the level of risk these shared contact points pose with a focus on what conditions are conducive to high bacterial loads.

POSTER SESSION 3

Commons West, Easel 16

2:30 PM to 4:00 PM

The Buffering Effect of Social Support on Internalizing Symptoms in Transgender Youth

Sophia Robinson, Senior, Psychology

Mentor: Kristina Olson, Psychology

Mentor: Lily Durwood, Developmental Psychology

The mental health of transgender children, children who have socially transitioned to live as the gender “opposite” their assigned sex at birth, have not been researched extensively, although the occurrence of childhood social transitions have increased in recent history. Instances of bullying and discrimination are reported in the LGBTQ community in high rates, which has been known to lead to higher rates of internalized symptoms. Previous studies have looked at the stress buffering hypothesis, which postulates that social support protects against the negative effects of victimization experiences, but the results from those studies are mixed. In the present study, we examine whether social support moderates the association between bullying and discrimination with internalizing symptoms in transgender youth. To test our hypothesis, we had the parents of 265 socially transitioned children, from ages 3-15 (mean age 9.41), answer questions regarding a child’s support

structure (family, peer, school) and whether their child has been bullied and/or discriminated against specifically because of their gender. Our results show that the relationship between victimization experiences and internalizing symptoms was moderated by peer support, but not by family support or school support. We found that when participants had less peer support, being victimized more was associated with more internalizing symptoms, while higher levels of peer support do not yield significant results between the two variables, indicating that peer support may act as a buffer between victimization experiences and internalizing symptoms in transgender youth.

populations have the ability to create patterns of coevolution due to their adaptation to their abiotic environment.

POSTER SESSION 4

MGH 206, Easel 177

4:00 PM to 6:00 PM

Can Microbes Fake Coevolution?

Anna Marie (Annie) Pederson, Senior, Biology (Bothell Campus)

Aqsa Mohammed, Senior, Biology (Bothell Campus)

Yana Erika Pavlovskiy, Senior, Biology (Bothell Campus)

Mentor: Kristina Hillesland, Biological sciences, School of STEM

Coevolution is a process where two or more species reciprocally affect each other's evolution over time. The traits of one species evolves in response to the other. This process can lead to the diversification of organisms with unique adaptive traits. Previous experiments tested whether coevolution occurred during the 2000 generations of evolution between the bacteria *Desulfovibrio vulgaris* and archaea *Methanococcus maripaludis* by pairing populations from 1000 generations with mutualist partners from their evolutionary past or future. Results suggested patterns of coevolution, but hypothesizing that those patterns occurred by accident, we tested whether or not patterns can occur that look like coevolution with microbes that could not possibly coevolve. We conducted a timeshifts control experiment using freezer stocks of *D. vulgaris* and *M. maripaludis* that evolved alone for 2000 generations and created pairings of the mutualists with five different generational pairings. They then were paired with an ancestral control group and a modern test group from the 1000th generation. Growth rates were calculated for each coculture. Graphs of the effects the 1000th generation of *M. maripaludis* and *D. vulgaris* had on coculture growth rate showed that M1000 had similar growth rates irrespective of its partners evolution while D1000 results were variable. An ANOVA test showed the mean log ratios statistically indistinguishable across all timepoints, indicating that the null hypothesis should be accepted. This result suggests that both partners have the same effects on fitness no matter how long they evolved. However, due to variations in results between *D. vulgaris* and *M. maripaludis* it is still unclear whether these