



**School of Liberal Arts
Department of Anthropology**

In partial fulfillment of the requirements for the degree of
Doctor of Philosophy – Anthropology

Timothy McHale
will defend his thesis:



**ACUTE SALIVARY STEROID HORMONE RESPONSES DURING COALITIONAL AND DYADIC
COMPETITIONS IN HONG KONG JUVENILE CHILDREN**



A large body of research links testosterone and cortisol responses to competition during adulthood. Little psychoneuroendocrine research has explored salivary steroid hormone responses to competition during middle childhood. This project investigated the relationship between acute salivary steroid hormone change, performance, competitor type, and outcome effects in three different field studies, while controlling for Body Mass Index (BMI) and pubertal development, in a population of ethnically Chinese, Hong Kong juvenile children, 8-11 years of age. The relative dynamics of salivary steroid change were assessed during a 1) coalitional physical competition (soccer) in boys, 2) a non-physical mixed-sex coalitional competition (math contest), and 3) a dyadic, semi-physical competition (table-tennis) in boys. Results revealed that testosterone and estrogen were generally low and unmeasurable. The majority of boys experienced increases in dehydroepiandrosterone (DHEA) during both the soccer match and intra-squad soccer competitions only. DHEA and androstenedione change were related to performance during the math competition in both sexes. Androstenedione increased for the majority of boys during the soccer match competition only, where boys competed against unfamiliar competitors. This finding is consistent with previous research among a sample of boy soccer players in the U.S.A., suggesting that androstenedione may be sensitive to out-group competition. Cortisol increased during out-group competition only during the soccer competition study and cortisol and cortisol/DHEA molar ratio consistently decreased during competition involving peers during the math and table-tennis studies. These data highlight how steroid hormone responses to competition differ in juvenile children when compared to adults participating in similar forms of competition. Findings also reveal context-dependent factors, such as type of competition, performance, and competitor type that influence hypothalamic-pituitary-adrenal (HPA) axis activity. These studies underscore the importance of taking a cross-cultural, mixed-age, and mixed-sex approach to provide a broader understanding of HPA axis activity that likely reflects an adaptive, developmentally specific, physiological response to social competition across variable contexts in preparation for adulthood.

Date: Tuesday, November 14th, 2017

Time: 9:00 a.m.

Location: WRI-B114

Faculty, students, and the general public are invited.

Committee in Charge:

Dr. Peter Gray, Advisory Committee Chair
Dr. Alyssa Crittenden, Advisory Committee Member
Dr. Pierre Liénard, Advisory Committee Member
Dr. William Jankowiak, Advisory Committee Member
Dr. Erin Hannon, Graduate College Representative