

STATISTICS COLLOQUIUM

THURSDAY, SEPTEMBER 21, 2006

TALK: 4:30 PM — SCIENCE CENTER RM. 705

RECEPTION: 6:00 PM — SCIENCE CENTER, 7TH FLOOR

“Genetic Studies for Ordinal Traits”

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ABSTRACT

For complex diseases, especially mental health conditions including nicotine dependence and substance use, the outcome variables are often recorded in an ordinal rather than quantitative scale. The naturally recorded ordinal traits are usually analyzed either as quantitative traits or being dichotomized. It has been demonstrated repeatedly in recent studies that this commonly used approach to dealing with ordinal traits is inadequate and results in loss of power. After discussing general principles and an overview of related work, I will present score test statistics that belong to a general class of family-based association tests (FBATs) for ordinal traits. This new approach can adjust for the effects of covariates. Simulation results will be presented to compare the type I error and power of our proposed tests with existing tests. The empirical result suggests that our test produces reasonable type I errors and has better power than the existing tests. The proposed test was used to analyze GAW14 data on alcoholism and identified that several single nucleotide polymorphisms including rs485874, rs619, rs718251, rs1869907 are significantly associated with alcohol dependence after adjusting for gender and age.

This is a joint work with Xueqin Wang and Yuanqing Ye.