General Linear Model Workshop. University of Manitoba. 18-19 March 2021
   David Schneider. Memorial University, St. John's Canada

<u>Workshop goals.</u> Many of the statistical analyses in the natural sciences are special cases of the general linear model (GLM). These include regression, multiple regression, t-tests, ANOVA, ANCOVA. These are readily extended to experimental studies using general linear mixed models (GLMM). GLM analyses are readily extended to non-normal errors for count data with the generalized linear model (GzLM). Examples are goodness of fit tests, contingency tests, and logistic regression, Many of the analyses undertaken by graduate students do not have a name but can be done in the framework of the GLM, GLMM, or GzLM. The goal of this workshop is to introduce you to a GLM/GLMM analysis, which frees you from "name that test" thinking.

Questionnaire for planning purposes.   No names please.

1. Program: Masters   PhD   Other

2. Thinking about your thesis.   Do you have a thesis topic? Yes   No

        If so, are you doing manipulative experiments in the lab or field? Yes   No

        If so, are you doing surveys or other observational studies (most of ethology)? Yes   No

        If so, do you have count data ?   Yes   No

        Have you collected data yet for your thesis? Yes   No

2. Previous experience with statistics   Number of courses

        Statistical packages: R   SPSS   Other

        Experience with R: None   Beginner   Advanced

3. Univariate and multivariate statistics.
    Univariate means a single Y variable plotted relative to one or more explanatory variables.
    This includes ANOVA, multiple regression, and ANCOVA.
    Multivariate means many Y variables, as a matrix of variables and cases.
    This includes MANOVA, PCA, and discriminant analysis.

        List your interests: Univariate   Yes   Somewhat

                                          Multivariate   **Yes**   Somewhat

4. Experience with online learning   Number of courses

    List learning management systems (LMS) you have used.

     Zoom   Webex   Brightspace/UMLearn   Others

     If you have used a LMS,

            Did you as student participate in breakout rooms? Yes   No

            Did you as student use the share screen function? Yes   No

            Have you as student made a presentation (use share screen and mike)?Yes   No

If you plan to attend please send an email to Victor Valdez at [valdezv@myumanitoba.ca]. We will need these to set up online access for you.

Intro to R basics pre-session (Tuesday, March 16th, 2021)			
Participants	*Session*	*Time*	*Modules*
Victor V. and Taurai M.	**Afternoon**	1 to 5:30 P.M.	**R fundamentals and know-how**

Workshop Day 1 (Thursday, March 18th, 2021)			
Lead	*Session*	*Time*	*Modules*
DCS	**Morning**	**10 to 10:50 A.M.**	**Module 1: Learning to write statistical models**
		5 to 10 min	**Coffee Break**
		11 to 11:50 A.M.	**Module 2:Statistical models for experimental design**
		12 to 12:55 P.M.	**Lunch Break**
VV	**Afternoon**	**1 to 1:35 P.M.**	**Module 3: Practice with R - Module 1 models**
		5 to 10 min	**Coffee Break**
		1 :45 to 3 P.M.	**Module 4: Executing experimental design models in R**

Workshop Day 2 (Friday, March 19th, 2021)			
Lead	*Session*	*Time*	*Modules*
DCS	**Morning**	**10 to 10:35 A.M.**	**Lightning review of writing statistical models & GzLM**
		5 to 10 min	**Coffee Break**
DCS and VV		**10:45 to 11:55 A.M.**	**Module 5: GLM extensions--Multivariate analysis (PCA, CCA)**
		12 to 12:55 P.M.	**Lunch Break**
DCS and VV	**Afternoon**	**1 to 1:50 P.M.**	**Module 6: Executing multivariate models (with R code)**
		5 to 10 min	**Coffee Break**
		2 to 3 P.M.	**Module 7: GLM extensions: MANOVA/MANCOVA**
		2:30 to 3 PM	**Open Session**