

Statistical Modelling of Complex Hierarchical Data

A Workshop by Dr. J. Douglas Willms on Statistical Modelling including Hierarchical Linear Modelling (HLM) and Growth Trajectories

Workshop Details

► *Dates and times*

Wednesday, October 8 – Friday, October 10, 2008

- Wednesday, October 8 8:30 am to 4:30 pm
- Thursday, October 9 8:30 am to 4:30 pm
- Friday, October 10 8:30 am to 2:30 pm

► *Location*

- Fredericton, New Brunswick – Wu Conference Centre, University of New Brunswick.
Link: www.wucentre.unb.ca

► *Topics to be covered*

- The aim of this course is to familiarize participants with analytic techniques appropriate for analyses of hierarchically structured data, such as data from the Programme for International Student Assessment (PISA) and the National Longitudinal Survey of Children and Youth (NLSCY).
- The first two days (Oct 8-9) will be devoted to the basic ideas and applications of hierarchical linear modelling (HLM). Some of the most interesting and important policy questions concern the effects on peoples' outcomes associated with receiving services from certain institutions such as pre-schools, schools, or school districts, or with being a member of particular communities, neighborhoods or cities. Multilevel models employ data describing individuals and the organizational units in which they are grouped. These models are not limited to institutional or community settings. They can be applied to any organizational unit, such as the family, the school or health authority, or the community.

This part of the hands-on course will build upon participants' understanding of multiple regression, and teach the use of the program *Hierarchical Linear Models* (HLM) covering the following topics:

- 1) Introduction: Why HLM instead of Ordinary Least Squares Regression?
 - 2) The basic two-level model (i.e. students nested within schools);
 - 3) Examining residuals at the first and second levels;
 - 4) Estimating the effects of group-level characteristics (i.e. school effects);
 - 5) Three-level hierarchical models (e.g., students, schools, countries);
 - 6) Two and three-level logistic regression analyses.
- Many of the examples will employ data from the Programme for International Student Assessment (PISA) conducted by the Organization for Economic Cooperation and Development (OECD). Therefore, students will have the opportunity to learn about this important international study and how estimates of the variation among countries, schools, and students can be estimated with HLM using the complex design weights inherent to this study.

- The final day of the course (Oct 10) will be devoted to understanding multilevel growth models. In many research endeavors data are collected for individuals on the same outcome measure at several points in time. These data can be used to construct individual “growth trajectories” for each participant. HLM provides a framework for modelling growth trajectories and asking questions about how the trajectories differ across individuals or higher level groups such as classrooms or schools. Although we will not be able to use the longitudinal data from the NLSCY, we will discuss its structure, including design weights, and provide some examples of syntaxes we have used to set up the data for growth analysis.

► **Costs and Particulars**

- **\$795.00 (CAD)* per participant**, which includes:
 - 1) Course tuition;
 - 2) Course pre-reading list (sent in advance);
 - 3) Syntax files for analysis of PISA 2003 data;
 - 4) Morning and afternoon nutrition breaks, and lunch, Oct 8 to 10, 2008.
- Participants will be responsible for their own transportation to, from and within Fredericton as well as their own hotel accommodation costs.
- Payment may be made via cheque, money order or wire transfer and should be made out to KSI Research International Inc. For wire transfer details, inquire info@ksiresearch.com.

► **Suggested List of Accommodations in Fredericton**

Where to stay in Fredericton:
The Delta Fredericton Hotel - http://www.deltahotels.com/ 225 Woodstock Road Toll Free Reservation Phone 1.888.890.3222 Hotel Direct Phone 1.506.457.7000
The Carriage House Inn (B&B) - http://www.carriagehouse-inn.net/ 230 University Ave (walking distance to UNB) Toll Free Reservation Phone 1.800.267.6068 B&B Direct Phone 1.506.452.9924
The City Motel - http://www.thecitymotel.com/ 1216 Regent St Toll Free Reservation Phone 1.800.268.2858 Hotel Direct Phone 1.506.450.9900
The Crown Plaza Hotel - www.cpfredericton.com 659 Queen St. Toll Free Reservation Phone 1-866-444-1946 Hotel Direct Phone 1.506.455.3371

► ***Other Details - IMPORTANT***

- A maximum of 30 participants will be enrolled in the workshop; enrollment is on a first-come, first-serve basis. If necessary, a waiting list will be created to accommodate other people in the event of cancellations.
- **Participants are expected to supply their own Window's laptop computer with a current version of SPSS (13.0 or higher). Necessary programs and data will be supplied (including a trial version of HLM).**
- **Participants must secure their position in the workshop with full payment by August 31, 2008.** Those who cancel prior to September 15, 2008 will receive a refund of \$600. Those canceling between September 15, 2008 and October 1, 2008 will receive a refund of \$300. Refunds will not be given for cancellations after October 2, 2008.
- In the event that the workshop is to be cancelled by KSI due to unforeseen circumstances, participants will receive a full refund for tuition costs. KSI will not be responsible for any losses associated with travel costs.

► ***How to Register***

- Send your ([registration form](#)) to Beth Fairbairn by email info@ksiresearch.com to indicate your interest and reserve your spot. A confirmation will be sent to you via email and your registration will be considered complete once your payment has been processed.
- Link to registration form:
http://www.ksiresearch.com/workshops/Registration_Statistical_Modelling_October_2008.doc
- Full details available at www.ksiresearch.com

About the Instructor

J. Douglas Willms is a Professor and Director of the Canadian Research Institute for Social Policy at the University of New Brunswick (UNB). He holds the Canada Research Chair in Human Development at UNB and is a Fellow of the Royal Society of Canada and the International Academy of Education.

Dr. Willms has published over two hundred research articles and monographs pertaining to youth literacy, children's health, the accountability of schooling systems, and the assessment of national reforms. He is the editor of *Vulnerable Children: Findings from Canada's National Longitudinal Study of Children and Youth*, (University of Alberta Press, 2002) which received the Canadian Policy Research Award in 2002, and the author of *Student engagement at school: A sense of belonging and participation* (Paris: Organization for Economic Cooperation and Development), and *Monitoring School Performance: A Guide for Educators* (Falmer Press, 1992). Dr. Willms played a lead role in developing the questionnaires for Canada's National Longitudinal Survey of Children and Youth (NLSCY) and the OECD's Programme for International Student Assessment (PISA). Recently, Willms and his colleagues designed the Early Years Evaluation (EYE), an instrument for the direct assessment of children's developmental skills at ages 3 to 6, and *Tell Them From Me*, an evaluation system for the continuous monitoring of school climate and student engagement and wellness. Dr. Willms is known for his training of new investigators in the analysis of complex multilevel data. He regularly conducts workshops on multilevel modeling across Canada and throughout Asia, Europe and South America. He also established the New Investigators Network, an interdisciplinary, collaborative network of Canada's top social science researchers in the field of human development. Dr. Willms's current interests include the examination of family, school and community factors that contribute to the health and well-being of children and adolescents, and the use of continuous monitoring for evaluating school reforms.

www.unb.ca/crisp/willms.html