BIOGRAPHICAL SKETCH

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NAME: Ross Jacobucci

eRA COMMONS USER NAME (credential, e.g., agency login): JACOBUCC

POSITION TITLE: Assistant Professor of Psychology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Luther College, Decorah, IA	BA	6/2010	Psychology (Honors)
University of Northern Iowa	MA (ABT)	2011-2013	Psychology (Individualized Study)
University of Southern California, Los Angeles, CA	MA	12/2015	Psychology (Quantitative Methods)
University of Southern California, Los Angeles, CA	PHD	07/2017	Psychology (Quantitative Methods)

A. Personal Statement

I have the expertise, leadership, training, and motivation necessary to successfully carry out the proposed research project. My research in quantitative methodology has focused on incorporating psychometric models with data mining methodology. In addition to my quantitative training, I have a broad background in psychology, with specific training in clinical research. This has manifested itself in both past and ongoing projects that have focused on predicting and understanding both suicidal and non-suicidal self-injury. Additionally, during the last three years of my PhD training I was supported by an NRSA T32 in Gerontology that focused on incorporating methods for integrating datasets with data mining to produce more generalizable results. Since 2015, I have taught at workshops sponsored by the American Psychological Association and Institute for Social Research on both longitudinal structural equation modeling and exploratory data mining. This training and focus has resulted in publications on using data mining to account for attrition, blending latent variable models with regularization (a form of data mining), and predicting suicidal and non-suicidal self-injury. This has been extended to serving as a consultant on two grants specific to suicide, both having a focus on incorporating data mining methods to overcome the hard to predict nature of suicide. Specific training in integrative data analysis, an expertise in pairing data mining with psychometric models, and my experience in numerous projects related to suicide make give me confidence in my ability to lead a project on incorporating integrative data analysis and data mining to predict suicide.

a) **Jacobucci, R.**, Grimm, K. J., & McArdle, J. J. (2016). Regularized structural equation modeling, *Structural Equation Modeling, 23,* 555-566.

b) Grimm, K. J., **Jacobucci, R.**, McArdle, J. J. (January, 2017). Big data methods and psychological science. *Psychological Science Agenda.*

c) Ammerman, B. A., **Jacobucci, R.**, & McCloskey, M. S. (in press). Using exploratory data mining to identify important predictors of non-suicidal self-injury frequency. Psychology of Violence.

B. Positions and Honors

Positions and Employment
2011 - 2013   Teaching and Research Assistant, University of Northern Iowa
2013 - 2014   Research Assistant, University of Southern California
2015 - 2017   Predoctoral Trainee in Gerontology at University of Southern California
2015 -   Instructor, various workshops on exploratory data mining and structural equation modelling.
2017 -   Assistant Professor of Psychology (Quantitative), University of Notre Dame

Honors
2014   APA Science Directorate Travel Award
2014, 2015   Society of Multivariate Experimental Psychology Travel Award
2015   International Society for Intelligence Research Travel Award
2016   USC Psychology Department Travel Grant Award

Other Experience and Professional Memberships

2017-   Member, Association for Behavioral and Cognitive Therapies
2017-   Member, Association for Psychological Science
2016-   Member, Psychometric Society
2015-   Member, Gerontological Society of America

C. Contributions to Science

1. My main focus of research is in the development and evaluation of data mining in psychological research. This has mainly focused on the use of Decision Trees (DTs) and their extensions (e.g. random forests). My dissertation evaluated the use of DTs, particularly in the generalizability of the resultant tree structures. This work culminated in an R package (Jacobucci, 2017) that makes the application and evaluation more accessible for applied researchers. This work has further extended to the creation of the longRPart2, an additional R package that allows for the identification of clinically meaningful subgroups using DTs with mixed effects models for longitudinal data. Finally, in applying a data mining framework to longitudinal data, we showed how the use of DTs and random forests to create sample weights improves the estimation of models while accounting for attrition in large surveys (Hayes, Usami, Jacobucci, McArdle, 2015).

   a) **Jacobucci, R.**, Stewart, S., Abdolell, M., Serang, S., & Stegmann, G. (2017). longRPart2: Recursive Partitioning of Longitudinal Data (version 0.0.1) [Software]. Available from https://cran.r-project.org/web/packages/longRPart2/index.html
   b) **Jacobucci, R.** (2017). dtree: Decision Trees (version 0.2.3) [Software]. Available from https://cran.r-project.org/web/packages/dtree/index.html
   c) **Jacobucci, R.**, Grimm, K. J., & McArdle, J. J. (2017). A comparison of methods for uncovering sample heterogeneity: Structural equation model trees and finite mixture models. *Structural Equation Modeling,* 24. 270-282.
   d) Hayes, T., Usami, S., **Jacobucci, R.**, & McArdle, J. J. (2015). Using classification and regression trees (CART) and random forests to analyze attrition in longitudinal data: Results from two simulation studies, Psychology and Aging, 30, 911-929.

2. Traditional forms of estimation in structural equation modeling is not particularly well equipped to test large models, both in the number of participants and variables. A large portion of my research has focused on the development and expansion of a method I have termed regularized structural equation modeling (RegSEM). RegSEM, implemented as the regsem package (Jacobucci, 2016) in R, provides researchers with the ability to penalize any parameter in a structural equation model. This allows researchers to estimate extremely large

models and perform variable selection within the latent variable model framework. More specific applications of RegSEM include mediation models (Serang, Jacobucci, Brimhall, & Grimm, in revision), resulting in a method we termed exploratory mediation analysis via regularization, in addition to applications in Bayesian modelling (Jacobucci & Grimm, revision requested) and in longitudinal models (Jacobucci & Grimm, accepted).

a) Serang, S., **Jacobucci, R.**, Brimhall, K. C., & Grimm, K. J. (in press). Exploratory mediation analysis via regularization. *Structural Equation Modeling.*

b) **Jacobucci, R.** (2017). regsem: Performs Regularization on Structural Equation Models (version 0.8.1) [Software]. Available from https://cran.r-project.org/web/packages/index.html

c) Jacobucci, R. & Grimm, K. J. (accepted). Regularized estimation of multivariate latent change score models. In Ferrer, E., Boker, S., & Grimm, K. J. (Eds.), *Advances in Longitudinal Models for Multivariate Psychology: A Festschrift for Jack McArdle.*

d) **Jacobucci, R.**, & Grimm, K. J. (revision requested). Comparison of frequentist and Bayesian regularization in structural equation modeling. *Structural Equation Modeling.*

3. My final focus of research has been the application of data mining for clinical psychology research, specifically suicide and non-suicidal self-injury. For example, I used conditional inference trees to derive age cutoffs for assessing the severity of non-suicidal self-injury and suicidality (Ammerman, Jacobucci, Kleiman, Uyeji, & McCloskey, in press). In a similar vein, I applied both lasso regression and random forests to perform subset selection and quantify variable importance in predicting the non-suicidal self-injury age of onset (Ammerman, Jacobucci, & McCloskey, in press). This application validated the findings across methods, and increased the confidence in our findings. Furthermore, as a multivariate generalization of decision trees, I used structural equation model trees to identify cutoffs for DSM-5 criteria for non-suicidal self-injury (Ammerman, Jacobucci, Kleiman, Muehlenkamp, & McCloskey, 2016). This was the first study of its kind, and allowed for us to search for optimal cutoffs in relationship to a meaningful multivariate outcome (one-factor model). Overall, I have developed in integrative framework for applying the methods developed in the above sections one and two for the prediction of suicidal and non-suicidal self-injury.

d) Ammerman, B. A., **Jacobucci, R.,** Kleiman, E. M., Uyeji, L., & McCloskey, M. S. (in press). The relationship between nonsuicidal self-injury age of onset and severity of self-harm. *Suicide and Life Threatening Behavior*.

e) Ammerman, B. A., **Jacobucci, R.,** Kleiman, E. M., Muehlenkamp, J. J., & McCloskey, M. S. (2016). Development and validation of empirically derived frequency criteria for NSSI disorder using exploratory data mining, *Psychological Assessment.*

f) Burke, T. A., **Jacobucci, R**., Ammerman, B. A., Piccirillo, M., McCloskey, M.S., & Alloy, L. B. (Revision Requested). Identifying the relative importance of non-suicidal self-injury features in predicting suicidal ideation and behavior using exploratory data mining. *Psychiatry Research.*

D. Additional Information: Research Support and/or Scholastic Performance

Pending Research Support

Evan Kleiman (PI)   **Under Review**
Sponsored: Military Suicide Research Consortium Common Data Elements
Enhancing Identification of Suicide Risk among Military Service Members and Veterans: A Machine Learning Approach to Suicidality.
Using the common data elements of the MSR-C to develop data mining algorithms to separate suicide attempters from non-attempters, with the goal of creating something that can give an indication of potential suicide risk among service members without having to directly ask about suicide.
Role: Consultant

Ongoing Research Support

Taylor Burke (PI)   **10/16/17-10/16/18**
Sponsored: James Morgan Fund for New Directions in the Analysis of Complex Interactions.
Using Exploratory Data Mining to Enhance Prediction of Suicide Risk among Youth in Medical Care Settings
The aim is to develop models using and random forests to predict suicide attempt history using a behavioral health screening tool administered in emergency department and primary care pediatric health care settings.
Role: Consultant

Completed Research Support

T32 AG000037-38   Crimmins (PI)   **01/01/15-07/31/17**
Sponsored: Ruth L. Kirschstein National Research Service Award
Predoctoral trainee on the Multidisciplinary Research Training in Gerontology Grant at USC. Examined and developed methods for identifying heterogeneity and changes in trajectories for both cognitive ability and health.
Role: Predoctoral Trainee
Supervisors: John J. McArdle & Elizabeth Zelinski