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 train students in psychometrics and machine learning. My research in quantitative methodology has focused on incorporating psychometric models with machine learning methodology. This has resulted in multiple publications that detail novel developments in advanced statistical models and their application to psychological research. In addition to my quantitative experience, 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, as well as new projects that pair quantitative (text mining) analyses with qualitative (text) data to better understand maladaptive behavior. This training and focus has resulted in publications on using machine learning to account for attrition, blending latent variable models with regularization (a form of data mining), and predicting suicidal and non-suicidal self-injury, among others.

Specific to my involvement in the proposed training program, I have developed novel quantitative methods while fostering multiple collaborations with researchers outside of the Quantiative area. This gives me confidence in my ability to serve as an effective faculty mentor. Additionally, I have been active in both securing small grants that have supported the collection of advanced text and assessment data as well as applying for larger mechanisms that will allow for more advanced forms of data collection. Despite being early in my career, I have developed the foundational skills in quantitative research the application of advanced methodologies to research with high-risk populations, which will support the success of students in training program.

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

b) **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.

c) **Jacobucci, R.**, Brandmaier, A., & Kievit, R. (2019). A practical guide to variable selection in structural equation models with regularized MIMIC models. *Advances in Methods and Practices in Psychological Science, 2*, 55-76.

d) Jiang, M., Ammerman, B.A.**,** Zeng, Q., & **Jacobucci, R.** (In Preparation). What constitutes a helpful

response to suicide disclosures?: Findings from posts and comments on Reddit SuicideWatch. *Clinical Psychological Science.*

e) Wilcox, K. T., **Jacobucci, R.**, McClsokey, M.S., & Ammerman, B. A. (In Preparation). A Text Mining Approach to Characterizing Interpersonal Stress and Nonsuicidal Self-Injury. *Journal of Affective Disorder.*

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
2019   Anastasi Dissertation Award from Division 5 of the American Psychological Association

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 line of research has been in the development of new methodology that combines traditional psychometric models with those from machine learning. Specifically, I have focused on the development and expansion of a method I have termed regularized structural equation modeling (RegSEM; Jacobucci, Grimm, & McArdle, 2016). RegSEM, 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 (Jacobucci, Brandmaier, & Kievit, 2019). More specific applications of RegSEM include mediation models (Serang, Jacobucci, Brimhall, & Grimm, 2017; Serang & Jacobucci, in press), resulting in a method we termed exploratory mediation analysis via regularization, in addition to applications in Bayesian modelling (Jacobucci & Grimm, 2018a) and in longitudinal models (Jacobucci & Grimm, 2018b).

a) Serang, S., **Jacobucci, R.**, Brimhall, K. C., & Grimm, K. J. (2017). Exploratory mediation analysis via regularization. *Structural Equation Modeling*, *24*, 733-744.
b) **Jacobucci, R**. & Grimm, K. J. (2018a). 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.*
c) **Jacobucci, R.**, & Grimm, K. J. (2018b). Comparison of frequentist and Bayesian regularization in structural equation modeling. *Structural Equation Modeling,* 25, 639-649.
d) Serang, S. & **Jacobucci, R.** (in press). Exploratory mediation analysis of dichotomous outcomes via regularization. *Multivariate Behavioral Research.*

2. My second 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, 2018). 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, 2018). 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, & McCloskey, 2019). 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). Finally, I have been in charge of using machine learning to perform variable selection as a mechanism for predicting suicidal ideation and behavior (Burke, Jacobucci, R., Ammerman, Piccirillo, McCloskey, & Alloy, 2018). Overall, I have developed an integrative framework for applying the machine learning methods for the prediction of suicidal and non-suicidal self-injury.

a) Ammerman, B. A., **Jacobucci, R.,** Kleiman, E. M., Uyeji, L., & McCloskey, M. S. (2018). The relationship between nonsuicidal self-injury age of onset and severity of self-harm. *Suicide and Life Threatening Behavior*, *48*, 31-37.

b) Ammerman, B. A., **Jacobucci, R**., & McCloskey, M. S. (2018). Using exploratory data mining to identify important predictors of non-suicidal self-injury frequency. *Psychology of Violence, 8*, 515-525.

c) Burke, T. A., **Jacobucci, R**., Ammerman, B. A., Piccirillo, M., McCloskey, M.S., & Alloy, L. B. (2018). Identifying the relative importance of non-suicidal self-injury features in predicting suicidal ideation and behavior using exploratory data mining. *Psychiatry Research, 262,* 175-183.

d) Ammerman, B.A., **Jacobucci, R**. & McCloskey, M.S. (2019). Re-considering important outcomes of the NSSI disorder diagnostic criterion A. *Journal of Clinical Psychology, 75*, 1084-1097.

3. My final line of research is 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 (Jacobucci, Stewart, Abdolell, Serang, & Stegmann, 2018), an additional R package that allows for the identification of clinically meaningful subgroups using DTs with mixed effects models for longitudinal data (Stegmann, Jacobucci, Serang, & Grimm, 2018). We not only developed this method for modeling nonlinear effects in longitudinal data, but have further evaluated similar multivariate tree approaches in latent growth curve models (Usami, Jacobucci, & Hayes, in press).

a) **Jacobucci, R**., Stewart, S., Abdolell, M., Serang, S., & Stegmann, G. (2018). longRPart2: Recursive Partitioning of Longitudinal Data (version 0.2.3) [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) Stegmann, G., **Jacobucci, R**., Serang, S., & Grimm, K. J. (2018). Recursive partitioning with nonlinear change trajectories. *Multivariate Behavioral Research, 53*, 559-570.

d) Usami, S., **Jacobucci, R.,** & Hayes, T. (2019). The performance of latent growth curve model based structural equation model trees to uncover population heterogeneity in growth trajectories. *Computational Statistics, 34*, 1-22.

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

Ongoing Research Support

Ross Jacobucci (Co-PI)   **8/13/18-8/13/20**
Sponsored: Advanced Diagnostics and Therapeutics Discovery Fund
Using Integrative Data Mining to Improve the Prediction of Suicide: An Initial Application.
In secondary data, we utilize a combination of machine learning and data integration to elucidate the relationship between risk factors at multiple levels of analysis and lifetime and past 12-month suicidal ideation, plans, and attempts.
Budget: $41,068
Role: Co-PI

Ross Jacobucci (PI)   **Academic Year 2018-2019**
Sponsored: Institute for Scholarship in the Liberal Arts (ND) Small Research and Creative Work
Text Analysis for the Prediction of Suicide: A Pilot Study.
This grant provided support for creating an initial set of open-response items and collecting an online pilot sample.
Budget: $2,475
Role: PI

Evan Kleiman (PI)   **6/26/18-12/26/19**
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

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

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.
Budget: $15,000
Role: Consultant