Initial Report

Last Modified: 01/31/2018

1. Name (first and last)

Text Response
Kevin Krost

Statistic	Value
Total Responses	1

2. Email

Text Response
kevinkrost@vt.edu

Statistic	Value
Total Responses	1

3. Contact Phone

Text Response
479-970-1745

Statistic	Value
Total Responses	1

4. In Fall 2018 you will consider yourself to be a:

#	Answer	Bar	Response	%
1	VT Freshmen Undergraduate Student		0	0%
2	VT Sophomore Undergraduate Student		0	0%
3	VT Junior Undergraduate Student		0	0%
4	VT Senior Undergraduate Student		0	0%
5	Between Undergrad and Graduate school		0	0%
6	Graduate school		1	100%
	Total		1	

Statistic	Value
Min Value	6
Max Value	6
Mean	6.00
Variance	0.00
Standard Deviation	0.00
Total Responses	1

5. What degree(s) and major(s) are you pursuing along with institution?

Text Response
Ph. D. in Educational Research and Evaluation at Virginia Tech

Statistic	Value
Total Responses	1

6. List any Minors you are pursuing.

Text Response
Certificate in Preparing for the Future Professoriate

Statistic	Value
Total Responses	1

7. List any honors and/or awards received:

Text Response
Graduate Teaching Assistantship from 2015-present

Statistic	Value
Total Responses	1

8. Currently we have 1 program accepting applications which includes:

#	Answer		Total Responses
15	Data Science for the Public Good	0	0
	Total	0	-

Statistic	Data Science for the Public Good
Min Value	-
Max Value	-
Mean	0.00
Variance	0.00
Standard Deviation	0.00
Total Responses	-

9. Essay (up to 500 words): “What do you want to get out of this experience?”

Text Response
I am interested in gaining more experience at performing statistical research on several diverse projects as part of a large, interdisciplinary team. I want to conduct meaningful research which will benefit many people by answering complex and difficult questions. I want to grow as a quantitative researcher by having new experiences, meeting and working with different people, and learning new skills I can use in the future. Reading about the Data Science for Public Good program, the experience sounds like an incredible opportunity for students focusing on statistical research and data science. I am looking forward to applying the skills I have gained over several years in a positive way which has a large impact. Seeing the various program sponsors and past research, I am very confident that this program will provide the experience I am looking for and much more. It is clear that the research conducted in this program is high-quality, cutting-edge research. I am also interested in having new, diverse experiences with a wide variety of people on this team. Diversity and interdisciplinarity are both incredibly important given the complex challenges we are faced with as researchers. Projects require many people from different backgrounds whom contribute in novel and meaningful ways rather than a group of people from the same discipline. Based on what I read from the description of this program, we both believe in the importance of diversity of skills and backgrounds. This lab conducts research on many different topics based on the particular sponsor and shared interests. This is something I find very unique about statistical research and working with different organizations which I am looking forward to experiencing. I think it is very easy to be over-focused on a concept or phenomenon and that it is important to occasionally step back and think about the big picture. In my experience, this occurs when working with different organizations and helps benefit more people. That is one of the important characteristics of this lab, a focus on impactful research which affect many people in a positive way. Given these interests, I feel a strong connection to the DSPG program and the research you do. I am positive that I will have these experiences and many more through this program. I look forward to being an important part of this team over the summer, working with different people, and gaining new skills relevant to my future career.

Statistic	Value
Total Responses	1

10. Essay (up to 500 words): "Please describe any previous research experience and/or work experience you may have.”

Text Response
In my time in higher education, I have had many wonderful experiences conducting research and working in different positions. I believe it is important to have a wide variety of experiences to make me more well-rounded and prepared for the world after I graduate. For this reason, I have made it a point to continuously work throughout my tenure as a student. During my master’s degree, one of my first experiences with working as a researcher was performing statistical analyses for an educational lab. I was evaluating the effectiveness of an online tutoring program for high school physics concepts and helped in data collection, entry, cleaning, and analysis, with results indicating that the program helped by increasing student test scores. After that position, I received an assistantship where I worked in a testing center which administered the GRE, MCAT, and TOEFL tests, among others. I helped ensure that all testing protocols were followed so valid inferences could be made from these tests. This position helped me understand test administration and data collection much better. I was here the rest of my degree and increased my responsibilities until I was one of the most senior staff. During that degree, I was involved in several research projects. The first was an evaluation of a newly implemented teacher evaluation program in the state and involved coding teacher comments, assessing interrater reliability, and statistical analyses of several scales. I also performed a large study for my master’s thesis in which I compared several methods to detect differential item functioning among students with disabilities and English-language learners. I found that both groups were meaningfully disadvantaged among several items and that item response theory methods were more effective at detecting meaningful differences than those based on classical test theory. Both of these projects were important with many implications, and resulted technical reports and national conference presentations. Since I started my Ph. D. program, I have had several research and work experiences. For the last two and a half years, I have been a graduate teaching assistant in my program’s lab and provide assistance to students in any of our courses. I have established a reputation in this role, such that students deliberately seek me out for my assistance and knowledge. I have been involved in several research projects during this time as well. A supervised experience is a large, mixed methods project about the school to prison pipeline in Virginia K-12 education. I have done both quantitative and qualitative research for this position. In terms of independent research, I have two current projects I am focused on. The first is comparing to methods to detect and model DIF using PISA data which I will present a paper on at the NCME conference. The second project is a simulation study I designed and ran evaluating the power and Type I error rate of two DIF detection methods when using a cognitive diagnostic model.

Statistic	Value
Total Responses	1

11. Essay (up to 500 words): "Please describe your background (courses taken, research projects, etc.) in statistics and mathematics."

Text Response

I have had extensive methodological and statistical training throughout my undergraduate and graduate education. I first became interested in quantitative research during an introductory applied statistics course during my undergraduate degree. Since then, I have progressed into the advanced and methodological researcher I am today. In my master's degree, I gained much knowledge and experience in statistics including parametric analyses like t-tests, ANOVA, regression, multivariate statistics, probability, psychometrics, and Bayesian analysis, among others. Additionally, I learned about their assumptions, how to test them, and their alternatives when assumptions were violated. During that time, I became interested in the subject of psychometrics and latent trait modeling which led me to pursue my Ph. D. focusing on them. Since joining my Ph. D. program in educational research and evaluation at Virginia Tech, I have increased my theoretical and practical knowledge of statistical and psychometric analysis. I am experienced with classical test theory, Rasch analysis, item response theory, and cognitive diagnostic models (CDM), as well as structural equation modeling (SEM) and hierarchical linear modeling (HLM). My training has included qualitative, mixed methods, evaluation, and assessment research skills which have made me a strong, well-rounded researcher. I have also been involved in several research projects on teams and independently. In one independent study, I am comparing two different models to detect differential item functioning based on gender and moderate or mediate the effect using relevant covariates. I am comparing the multiple causes, multiple indicators (MIMIC) model under SEM to the hierarchical generalized linear model (HGLM) to evaluate which model is better at detecting DIF and modeling covariates which explain the DIF. This project incorporated several statistical concepts in a novel way. Another study I am developing is a simulation study investigating the power and Type I error rates of two DIF statistics when performing the analysis using a CDM. These models are relatively new and their evaluation has been limited, thus this simulation study will help understand their functionality and inform applied researchers who will conduct a similar study in the future. Recently, I have been the main graduate research assistant for a large mixed methods study focusing on the school to prison pipeline in Virginian K-12 education. In this project, I have been involved in a multitude of roles in various capacities including data collector, analyst, and researcher. I helped operationalize the research questions into well-defined analyses. I helped determine the best way to conduct a particular analysis, and interpret the results for a wide variety of audiences. I performed several in-depth analyses, including exploratory factor analysis, t-tests, ANOVA, and reliability analysis, among others. Additionally, I performed in-depth data cleaning and preparation to ensure that the data was ready for analysis. I have also been involved in the qualitative data collection and analysis since my research training has included that. Each of the previous topics refer to my statistical and methodological background and training. However, my knowledge and skills extend far beyond the previous descriptions, both inside and outside of statistical training.

Statistic	Value
Total Responses	1

12. Essay (up to 500 words): "Please describe your background (courses taken, research projects, etc.) in social and behavioral sciences."

Text Response

I first became interested in the social and behavioral sciences during high school when I took the advanced placement (AP) psychology course and received college credit for it. This helped later on when I was deciding my major during my undergraduate degree. I selected psychology as my major for several reasons, and am still interested and receiving training in it and the social sciences today. I am interested in the social and behavioral sciences because I think that people are such interesting and complex beings which are so challenging to study. Within the broader social sciences, I am most interested in cognitive processes, mental measurements, and social psychology. During my undergraduate degree, I was exposed to these subjects and many others, which made me interested in conducting research on people. This helped focus my education on statistical methods being applied to phenomena in the social sciences which led to my graduate training. During my master's degree, my social sciences interests and research shifted from psychologically-focused to education-based while still applying statistical methods. This shift led to my interest in psychometrics and their application to both education and psychology. I was involved in a research project which applied natural language processes to an interactive online tutoring program. This project blended my psychological and educational interests, while allowing me to apply my statistical training. My degree culminated in my master's thesis which used multiple statistical methods to detect DIF among both students with disabilities and English-language learners on a state-level educational assessment. Both of these experiences had psychological, educational, and statistical components to them. Currently, my social sciences interests are focused on the intersection of psychology and education. Specifically, I took an introductory course in educational psychology which was about motivation and cognition which surveyed the most relevant, contemporary motivation theories. The professor of this course has developed his own model which measures eMpowerment, Usefulness, Success, Interest, and Caring and is referred to as the M.U.S.I.C. model. I have been doing research about recently and performed a confirmatory factor analysis on this instrument in an undergraduate geography course and expanded into a larger structural equation model. I have used the MUSIC model to predict student effort in the course, and evaluated the moderating effects of the cost and ease on this prediction. These relationships were expected theoretically and were present with some of the MUSIC factors but not all. The MUSIC factors success, interest, and caring had direct predictions of effort, while usefulness, success, and caring had indirect predictions of effort. Interestingly, empowerment did not significantly predict effort, ease, or cost. This project is currently in-progress with the hopes of publishing the results. My social and behavioral sciences background has been quite varied since I started my training in it but remains quite strong based on my previous experiences. Given my interest, I plan to continue researching important social sciences phenomena for the rest of my career.

Statistic	Value
Total Responses	1

13. Essay (up to 500 words): "Please describe your background in programming."

Text Response

I have had many different experiences in programming in several different languages during my higher education. These have focused on statistics and are one of my strengths as a researcher which I use on a regular basis and continue to learn about and grow at. My first experience with statistical programming was using syntax to perform statistical analyses during my undergraduate degree. This was an excellent introduction to programming because the syntax that SPSS uses is very intuitive and understandable with a straightforward logic. It is also nice that the point-and-click interface can be used initially and directly produce syntax which can then be edited. Depending on what type of procedure I am doing, I can use either the point-and-click interface and produce the syntax, or use already-developed syntax and modify it as necessary. This is a large strength of SPSS and its syntax which I use for virtually all of my statistical analyses in SPSS. Similar to SPSS, the software STATA makes use of both point-and-click interfaces and syntax. The working environment automatically produces syntax even when using the interface and makes it very easy to modify the syntax or perform a similar analysis. This flexibility makes STATA syntax comparable and a competitor to SPSS syntax. I have also been extensively trained in other programming languages like SAS and RStudio. During my master's degree, one of the required courses focused on statistical software which was where I began using and appreciating SAS. In this class, both base SAS and SAS Enterprise Guide were used, and consisted of learning basic functionality, common analyses, and developing programs. This helped me overcome the learning curve associated with SAS and become a strong programmer. Other courses used SAS for different purposes specific to the course content, including performing simulation studies, Bayesian analysis, regression, and psychometric analyses. When learning about Bayesian analysis, both SAS and the programming freeware WinBUGS was used. For both software, I am comfortable and fluent in several statistical procedures beyond Bayesian analysis and still use both programs regularly. My final programming language which I have been using more frequently is the freeware RStudio, a user-friendly version of R with a graphical user interface. I performed my previously-mentioned simulation study using RStudio and, in the process, have become more knowledgeable and comfortable using it. My focus has been predominately on the package "GDINA" which performs analyses based on CDMS and is quite flexible. I have also gained more general experience in terms of data manipulation, import and export procedures, and commonly-used packages like "psych" and "lavaan." These reflect my quantitative and psychometric interests. In my experience, the most important thing about programming is familiarity and comfortability with the various languages. Given that, I have learned several important procedures in each of the top programming languages and feel comfortable using them. These aspects make me a strong programmer in each of the languages I described and I enjoy learning new functions and procedures in each of them.

Statistic	Value
Total Responses	1

14. Essay (up to 500 words): "Please provide information about other significant courses you have taken within your field of study."

Text Response

In my current program, I have taken several different courses in my field which have helped me develop into a well-rounded researcher. This includes qualitative research I and II, as well as mixed methods. In these courses, I learned about several aspects including conducting interviews, philosophical standpoints, paradigms, appropriate research questions and designs, and data analysis methods. I am knowledgeable about Grounded Theory and using it to make causal inferences. In mixed methods, I learned about prioritizing, data collection and analysis, timing, mixing at different stages, and defining quality in mixed methods research. Each of these classes has made me more informed beyond statistical methods, and helped me understand the limitations of statistics for answering questions. Other relevant classes I have taken include evaluation methods and assessment. Both of these classes focused more about broader frameworks than specific data analysis methods. Several aspects were discussed, including translating a stakeholder's ideas into research topics, selecting appropriate methods, logic models, distinctions between both frameworks and other methodologies, and visualizing and presenting findings, among other topics. Both courses had project components to provide tangible, hands-on experience in both frameworks. For the assessment course, I developed a website which focused on measurement issues in assessment and how to educate assessment specialists about them. While, for evaluation methods, I developed an evaluation proposal for a new Virginia Tech initiative called Destination Areas. In that project, I went through several steps that would occur if I was evaluating the program like meeting with stakeholders, developing research questions and a logic model, and deciding appropriate analyses. Both of these experiences were incredibly useful and helped me realize the importance of both frameworks and how to use them for different purposes. The final relevant course I have taken was called Communicating Science and it focused on explaining difficult concepts to a wide variety of audiences in an understandable way. This class was incredibly useful since, as researchers, we have to describe difficult concepts and phenomena to many different people like stakeholders or the public. This skill is more important now than it has ever been, and yet many researchers lack it, particularly stereotypically quantitative researchers. Since I took this class, I am much more capable at communicating difficult concepts to various people and am regularly sought out in my current role as a graduate teaching assistant. The true test of this skill was when I visited my parents over winter break and was able to have conversations with both of them about different concepts that many people struggle at understanding. These courses represent a portion of the other relevant courses I have taken in my field. Particularly, I regularly attend specialized workshops at different conferences and institutes in order to stay on the cutting-edge of my field. In this sense, I plan to be a life-long learner both within my field and my life, in general.

Statistic	Value
Total Responses	1

15. Please list the name and contact information for 2 references (teachers, mentors, or employers) that we will contact for a letter of reference/brief survey. Please make sure you list the correct email and they know we will be contacting them soon (within the next week). Only 2 references will be contacted; do not list more than 2.

Text Response
Gary Skaggs, Ph. D., at gskaggs@vt.edu. Yasuo Miyazaki, Ph. D., at yasuom@vt.edu

Statistic	Value
Total Responses	1