SUBMISSION TYPE
Alternative Session

TITLE
Future Analytics: Building a More Relevant Statistics Curriculum

SHORTENED TITLE
Building a More Relevant Statistics Curriculum

ABSTRACT
This session will explore the scientist-practitioner gap in the world of statistics by asking participants to build a more relevant statistics curriculum. Facilitators will help groups of students, practitioners and academics to work together to create the statistics curriculum of the future.

CITATION
Islam, S. (Moderator), Chetta, M. H., Fleck, C. Leffer, C. Mishra, V., Samipour-Biel, S., Simonet, D., Tseng, S. (2022) Future Analytics: Building a More Relevant Statistics Curriculum [Alternative Session] Society for Industrial Organizational Psychology Conference Boston, MA, United States

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MULTI-DISCIPLINARY CONTENT

Future Analytics: Building a More Relevant Statistics Curriculum

The purpose of this session is to build a new graduate-level statistical training program in industrial-organizational (I-O) psychology programs. Recent trends in the use of statistics in I-O psychology indicate an increasing demand on I-O students to learn sufficient skills in statistical modeling, coding, and data visualization. Building off of a previous SIOP session (Ahmad et al., 2022) where the focus was on determining whether graduate programs sufficiently provided effective statistics education, the present alternative session wishes to crowdsource the needs of students, practitioners, and academics. Using participants' viewpoints in the poles of the scientist practitioner gap of I-O psychology will allow the session attendees to think creatively about what material must be covered in an I-O psychology graduate statistics program to meet the needs of both applied practice and cutting edge science. The content of the alternative session should be helpful to a wide range of audience members, from program directors and faculty looking to revamp their curriculum, to students, practitioners and alumni looking to understand and learn the appropriate job-relevant statistical methods. A unique ingredient of this alternative session is that participants will build a new statistics curriculum for the future of I-O.

Brief Background

The initial trigger for this panel proposal was Ahmad et al (2022)'s SIOP session on data visualization. During this SIOP session, they presented on the importance of data visualization as a key statistics skill, as well as additional coding and data cleaning techniques. However, there remain many different skills needed to be an effective and data driven I-O. As illustrated by the SIOP career paths tool (SIOP, 2022), I-O psychology careers are varied and require different levels of data analytic skills. While researchers may focus on many advanced statistical skills, some argue that core skills such as descriptive statistics continue to be of great importance to

I-Os (Murphy, 2021). Additionally, the SIOP Education and Training Guidelines for Masters and Doctoral training programs indicate that students should have a basic knowledge of statistical foundation of methods, assumptions underlying the proper use of these methods and be able to make interpretations based on statistical evidence. Additionally, they recommend that students be able to use at least one statistical package and be able to communicate findings in layperson terms. While these guidelines are useful, they are not very specific and cover a large range of topics. Furthermore, a lack of clear understanding of statistics may be driving the anti I-O talent management practices and scientist-practitioner gap (Aguinis et al., 2017; Rotolo et al., 2018). Without a strong foundation of statistics that addresses practitioner needs and concerns, effective I-O psychology practices cannot thrive. This alternative session begins from an initial desire to understand how statistical methods are taught in graduate I-O curriculum (Ahmad & Zhou, 2021) and whether these truly address the needs of those in practice.

For example, in developing the curriculum plan for our own Master's in Professional Studies (MPS) I-O program, we reviewed KSAOs from numerous job advertisements that were recruiting Masters-level I-O practitioners. The most common KSAOs included "apply expertise in people research, quantitative analysis, data science and data visualization to provide insights on talent management and leadership development initiatives," and "track record in interpreting data creatively and delivering impactful insights (e.g., going beyond the 'what' of a research inquiry – into the 'so what' and 'now what'… and 'what haven't we thought of yet?)" In alignment with these job ads, SIOP's Professional Practice Committee conducted a "Career Study" and found that *oral communication* is a top competency for I-O psychologists across employment sectors (Zelin et al., 2015). However, a cursory review of several syllabi from various I-O graduate programs reveal that there is much more emphasis on advanced statistical

courses focused on, for example, structural equation modeling, multilevel analysis, and longitudinal analysis. This anecdotally reflects Murphy's (in press) findings that the focus of statistical analyses in I-O, both in research and in education, tends to be towards these "advanced" methods. In contrast, relatively little time is spent on understanding, interpreting, and using more simple methods and communicating them effectively to non-statistical audiences.

As another example, the presenters surveyed a group of program directors for I-O psychology Master's programs. SPSS was still the most widely used statistical program despite the increasing popularity of R in the applied world (Muenchen, n.d.). Despite the prevalence of SPSS, many program directors reported that they saw R as the future of statistical analysis. This disconnect makes this session's purpose an important one.

We wish to address Ahmad et al (2022)'s "education-practitioner gap," by crowd sourcing the necessary knowledge for a statistics curriculum. As the demand for data analytics skills increases, SIOP and its members must be able to teach its future students the key statistics skills necessary for the future. We feel that this session can help us to begin to build that curriculum.

Proposed Session

Our objective with the proposed alternative session is to address the gap in science and practice between what is taught in graduate statistics curricula, what students come into graduate programs knowing, and what is required in applied I-O psychology jobs. In particular, we highlight the perspectives from a wide variety of stakeholders in deciding and designing curricula: I-O program faculty, especially those faculty specializing in statistics, alumni working in industry jobs, and current students. By bringing together these diverse perspectives, we hope to engage the panel to build a better statistics curriculum for I-O psychology Masters and PhD

programs. We believe that the takeaway from this panel would be a set of action steps that program directors, faculty, and students can take moving forward to close this education-practitioner gap and advance the science of I-O in applied data analytics.

Panelist Biographies

Michael Chetta, Ph.D., is co-founder and current managing partner at Talent Metrics Consulting. In his career, Mike has worked for and with Fortune 500 organizations, public sector clients and non-profits, providing thought leadership and actionable analytics (quantitative and qualitative), while also influencing the design of global surveys, creating custom assessment & selection tools, and crafting bespoke performance management processes. Mike is also a full-time faculty member and the Director of the MS in IO Psychology Program at the University of Central Florida.

Christina Fleck, Ph.D., is on the People Analytics and Reporting team at Deloitte. Christina oversees the Program Evaluation and Sensing workstream where the team evaluates firm-wide initiatives, designs pilot studies to test new talent processes and tools, and scans talent perceptions and behaviors to implement data-driven interventions. Advanced statistics are often conducted as part of the team's day-to-day work to understand impact and differences as a result of initiatives or pilots. Christina is an active member of SIOP, the International Positive Psychology Association (IPPA), and METRO (a local I/O Psychology organization). She also serves as an Adjunct Professor at Westchester University.

Chelsea Leffler, B.S., is a current student in West Chester University's M.S. Industrial Organizational Psychology program graduating in May 2023. Chelsea currently holds positions as an Associate Consultant at Talent Metrics Consulting, and as Graduate Assistant of data monitoring and analysis for WCU's Office of Sustainability. Her areas of expertise and interests

include psychometrics and data analysis, people analytics, statistical techniques and visualization, workplace sustainability, well-being and mental health, and diversity, equity, and inclusion within organizations.

Vipanchi Mishra, PhD. is an Associate Professor of Industrial-Organizational Psychology and I-O Psychology Graduate Program Coordinator at West Chester University of Pennsylvania. She has taught psychology and management courses for over 10 years and has published in the areas of performance evaluation, newcomer adjustment, and perceptions of sexual harassment in the workplace. Dr. Mishra received her Ph.D. in Industrial-Organizational Psychology from the State University of New York at Albany.

Sabina Samipour-Biel, Ph.D. is an Assistant Professor of Industrial/Organizational Psychology at West Chester University. She has previously worked as an H.R. Analyst at Sherwin-Williams and integrates that practical experience into her People Analytics course for I/O Certificate and M.S. students at WCU. She uses R as the foundation for her People Analytics and Psychometrics courses. Her research on Transactive Memory Systems in teams involves agent-based computational modeling in R.

Daniel Simonet, Ph.D., is a Senior Research Scientist on Global Hiring Science for Amazon and a former Associate Professor of Psychology at Montclair State University. His research emphasizes individual differences and he has taught courses in Data Science for Social Science, Psychometrics, Personnel Selection, and Multivariate Statistics. He has worked to build a curricular program which caters to both theoretical and practical applications in machine learning, archival analysis, and text mining.

Steven Tseng

Our alternative session moderator is **Sy Islam , Ph.D.** He is the Vice President of Consulting at Talent Metrics Consulting and an Associate Professor of I-O psychology at Farmingdale State College. His applied work through Talent Metrics includes people analytics, employee engagement, computer assisted text analysis, and assessment design with small to medium sized businesses. His academic research interests include computer assisted text analysis, the use of memes in the academic classroom, and social media use of leaders.

Session Breakdown

Requested Time Slot and Session Plan

We are requesting 80 minutes for this alternative session. We believe that our session can easily fill the 80 minutes with an engaging activity that will generate interest from a wide variety of attendees ranging from faculty to program directors to students to practitioners. In addition to the activity there will be time for open discussion.

The session will proceed as follows. First, the chair will provide a five-minute introduction and instructions to the attendees. As attendees arrive, they will be asked whether they are a student, practitioner, or faculty member. Depending on their primary role each attendee will receive a card and be asked to congregate in one section of the room. These groups will serve as the breakout groups for the session. The chair will list the instructions of the session. Each group will be given a sheet of a Post-It Super Sticky Easel pad. Attendees will work in three 15 minute rounds broken out by 10 minute discussion and 5 minute debrief. During the first round, attendees will answer the question of which statistics techniques they have learned, and where the attendees learned these techniques. During the first round, the facilitators

will walk around the room and identify commonalities. At the end of the first round, some commonalities will be highlighted. We will specifically note the differences in MA and PhD statistics curricula. In the second round, the attendees will answer the question of which tools and techniques they use most often in their statistics work with a focus on understanding the different uses from the MA and PhD perspectives. The second round will be followed by facilitators identifying some commonalities and differences in responses. The session will conclude with a third round where the groups will build a statistics curriculum including statistics content, techniques, and even placement in a graduate program. For the remaining time of the session, we will use a large-scale curriculum map to ask participants where students should learn this material in MA courses, PhD courses, on the job, or independently. Session facilitators will also keep track of jobs that are mentioned throughout the session so participants can track which careers require advanced statistics. As a part of this effort, the groups will be encouraged to consider the commonalities and differences highlighted by the facilitators during round debriefs. Incorporating this into the larger will enable all participants to collaborate in building a draft curriculum that is cutting edge and, simultaneously, helps close the science-practitioner gap among statistic courses. Our intention is to share the work done in this session with the larger community through a potential article in The Industrial Organizational Psychologist.

Breakout groups by practitioner, academics, students

Round 1 What are the stats, techniques and courses where you learned stats? 10 minutes

Debrief 5 minutes

Round 2 Tools/techniques 10 minutes

5 minute debrief

Round 3 What jobs are particular stats/tools useful for? 10 minutes

30 minute discussion as a larger group to build the stats curriculum

Get back together as larger group discuss what the curriculum should look like in a curriculum document

Third path-discussion

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Figure 1