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Replication research: opportunities, experiences and challenges

Conference paper

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Replication research: Opportunities, experiences and challenges

Panel

Why do replication research? What does it take to do replication research well? What are some of the unforeseen challenges that replication research raises?

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Abstract

Replication is one of the main principles of the scientific method. In the physical sciences, new knowledge is often not considered valid until the original study has been replicated in other labs and the original results are not refuted. Replication will either improve confidence in our research

findings or identify important boundary conditions. Replications also enhance various scientific processes and offer methodical and educational improvements. The purpose of this panel is twofold. First, to explore the opportunities for scientific development that replication research enables by reflecting on the experiences of encouraging, doing and publishing replication studies. Second, to explore the various challenges that replication research raises about its value to individual scholars as well as to our collective understanding of phenomena within the information systems field.

Keywords: Replication, Research methods/methodology, Theory building

Introduction

Replication is one of the main principles of the scientific method. In the physical sciences, new knowledge is often not considered valid until the original study has been replicated in other labs and the original results are not refuted (Popper 1963). This replication by different labs and different researchers enables scientific consensus to emerge because the scientific community becomes more confident that subsequent

research examining the same question will not refute the findings. The social sciences, including the information systems field, is often considered as lagging behind the physical sciences which have more established traditions of independently replicating studies from other labs. There are numerous benefits to the field from embracing and valuing replication research. Replication will either improve confidence in our research findings or identify important boundary conditions. Replications also enhance various scientific processes and offer methodical and educational improvements. Collectively, these benefits will help the information systems discipline mature and prosper (Dennis and Valacich 2014).

Panel Focus

The purpose of this panel is twofold. First, to explore the opportunities for scientific development that replication research enables by reflecting on the experiences of encouraging, doing, and publishing replication studies. Second, to explore the various challenges that replication research raises about its value to individual scholars as well as to our collective understanding of phenomena within the information systems field (cf Niederman and March 2015). In particular, the discussion will draw on the experiences of the AIS Transactions on Replication Research (<http://aisel.aisnet.org/trr/>). This journal was launched in 2014 and published its first replication studies in 2015 including Osatuyi (2015) and Serenko and Turel (2015).

Replication studies, and the challenges they raise, have become an important topic within experimental psychology (Open Science Collaboration 2015), and whilst replication studies are less common in management research there is growing consideration of how to maximize the benefits of replication research for organizational and management phenomena (Easley et al. 2000; Hubbard et al. 1998; Singh et al. 2003; Tsang and Kwan 1999).

Studies of scientific practice have shown that in the physical sciences, replication of studies and experiments is actually undertaken far less frequently than might at first be expected. This counter-intuitive situation can be made sense of by considering the sociology of scientific practices (Barnes et al. 1996). Scientific institutions are all too often focused around making contributions to our base of knowledge (i.e. being the first to make a particular claim or discovery). For studies whose results are accepted, therefore, there is no incentive merely to confirm a particular result. Indeed, such replication would simply reinforce the status that is accorded to the researchers who made the initial discovery (Collins 1992). However, all replications are valuable in advancing science and will encourage better reporting of methodological details so that studies can be replicated with ease, it will increase the body of studies to enable better quality meta-analyses, will provide a vehicle for improving the methodological education of PhD students; and will provide an additional research venue for scholars not seeking to publish original research (Dennis and Valacich 2014).

The panel draws on the lessons learned from the journal (from the perspectives of both authors and editors) as well as broader reflections on the research process that seeks to develop insights that are replicable and generalizable (cf Lee and Baskerville 2003). In particular, the panel will address three key questions that are of interest to different segments of the information systems community: Why do replication research? What does it take to do replication research well? and What are some of the unforeseen challenges that replication research raises?

Panel Structure and Positions of the Panelists

Alan Dennis and **Sue Brown** are co-editors-in-chief of the AIS Transactions on Replication Research. They will open the panel by briefly reviewing the motivation for replication research in general as well as in the case of information systems. They will compare the status of replication studies in information systems with replication in other fields of business and management before setting the scene for the remaining panel presentations.

Binny Samuel will reflect on his experiences in designing and implementing replication studies including consideration of how to interpret the results of replication studies. By considering the relationship between generating new ideas and consolidating existing knowledge, Binny will discuss why he devoted “career bandwidth” to replication studies and how they fit into his research trajectory. During

his presentation, Binny will also highlight some of the risks and challenges of engaging in replication studies for those who are early career faculty.

Attempts to replicate existing research studies can reveal important boundary conditions implicit in the original studies. In his presentation **Barney Tan** will explore one specific boundary condition, namely the geographical context of the phenomena being studied and will question the extent to which the reviewing process may enforce a cultural hegemony whereby these important boundary conditions vary in the extent to which they are made explicit (Meriläinen et al. 2008) and the consequences of this for replications in different geographical contexts.

Edgar Whitley will explore the relationship between replication studies and open (big) data (Müller et al. 2016)—and highlight some of the challenges associated with open data and replication including privacy / re-identification concerns (O'Hara et al. 2011).

As one of the founding editors for the transactions, **Joe Valacich** will consider what makes a good (publishable) replication study, what studies are particularly ripe for replication and which, perhaps, are less in need of replication. He will also consider how well replication studies work in areas of fast moving technological developments.

Following the individual panelist presentations, **Alan Dennis** will open the discussion to audience members who will be able to comment and contribute to the discussion points raised by the panelists.

The panel will end with a brief summary by **Sue Brown** of the key points made during the panel.

Speaker biographies

Susan A. Brown is the McClelland Professor of Management Information Systems in the University of Arizona's Eller College of Management. She is co-Editor-in-Chief of AIS Transactions on Replication Research. She received her Ph.D. from the University of Minnesota and an MBA from Syracuse University. Her research interests include technology implementation, individual adoption, computer-mediated communication, technology-mediated learning and related topics. Her research has been published in MIS Quarterly, Information Systems Research, Organizational Behavior and Human Decision Processes, IEEE Transactions on Engineering Management, Communications of the ACM, Journal of the AIS and others. She has served or is currently serving as an associate editor for MIS Quarterly, Information Systems Research, Journal of the AIS and Decision Sciences. She is currently a senior editor at MIS Quarterly. Further information about Sue can be found at <https://mis.eller.arizona.edu/people/susan-brown>.

Alan R. Dennis is Professor of Information Systems and holds the John T. Chambers Chair of Internet Systems in the Kelley School of Business at Indiana University. He is co-Editor-in-Chief of AIS Transactions on Replication Research. Prof. Dennis has written more than 150 research papers, and has won numerous awards for his theoretical and applied research. His research focuses on three main themes: the use of computer technologies to support team creativity and decision making; IS for the subconscious; and digital innovation. He was named a Fellow of the AIS in 2012. Prof. Dennis also has written four books, two on data communications and networking, and two on systems analysis and design. Further information about Alan can be found at <http://www.kelley.iu.edu/ardennis/>.

Binny M. Samuel is an Assistant Professor of Information Systems at the University of Cincinnati. His focuses on two themes that examine human factor issues that affect the way individuals collaborate to build and use information systems (IS). Despite the pervasiveness of advanced information systems in businesses today, there still remain numerous human factor issues that are relatively unexplored regarding these technologies. Professor Samuel is involved in applied cognitive science research projects to improve how to effectively gather and analyze requirements for information systems in order to ensure they meet the needs of their users, including his dissertation research which examines cognitive aspects of data management requirements. From a use perspective, his research examines both facilitators and impediments to technology adoption. Further information about Binny can be found at <http://business.uc.edu/departments/obais/faculty/binny-samuel.html>.

Barney Tan is a Senior Lecturer from the Discipline of Business Information Systems at The University of Sydney Business School. He received his PhD in Information Systems from the National University of

Singapore. His research interests include strategic information systems, enterprise systems implementation, electronic commerce, Chinese IT management and qualitative research methods. His research has been published in *Information Systems Research*, *Journal of Association of Information Systems*, *IEEE Transactions on Engineering Management*, *Journal of the Association for Information Science and Technology*, *Information and Organization*, *Information and Management*, and *European Management Journal*. Further information about Barney can be found at <http://sydney.edu.au/business/staff/barneyt>.

Joseph (Joe) Valacich is an Eller Professor of MIS within the Eller College of Management at the University of Arizona, a Fellow of the Association for Information Systems (2009), and the Chief Science Officer (CSO) of Neuro-ID, Inc. He was the founding co-Editor-in-Chief of *AIS Transactions on Replication Research* and now serves as a Senior Editor. He received his Ph.D. degree from the University of Arizona (MIS) (1989), and M.B.A., and B.S. (computer science) degrees from the University of Montana. Dr. Valacich is a prolific scholar. His work has had a tremendous impact on numerous disciplines, including IS, computer science, psychology, marketing, and management. In August 2016, Google Scholar lists his citation counts over 18,680, with an h-index of 63. He has several patents related to identifying decision conflict, emotional state changes and suspicion using human-computer interaction data. He has also coauthored several leading textbooks. Further information about Joe can be found at <http://mis.eller.arizona.edu/faculty/jvalacich.asp>.

Edgar A. Whitley is an Associate Professor (Reader) in Information Systems in the Information Systems and Innovation Faculty Group of the Department of Management at the London School of Economics and Political Science. His recent books include (with Gus Hosein) *Global Challenges for Identity Policies* (Palgrave 2010) and (with Leslie Willcocks and Will Venters) *Moving to the Cloud Corporation* (Palgrave 2014). Edgar has a B.Sc. (Econ) and a Ph.D. in Information Systems both from the LSE. He is the co-editor of *Information Technology and People*, Senior Editor for the *AIS Transactions on Replication Research* and *Journal of Information Technology* and an Associate Editor for the *Journal of the AIS*. Further information about Edgar can be found at <http://personal.lse.ac.uk/whitley/>.

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