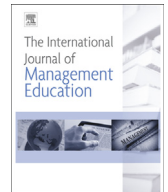


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## Research Notes

## Developing depth and breadth of research methods training for doctoral students with CARMA webcasts

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## ABSTRACT

Research methods training for doctoral students is crucial to the development of the management discipline, yet acquiring depth and breadth across research methods education in a doctoral program can be challenging. As a resource to enhance research methods training, the Consortium for the Advancement of Research Methods and Analysis (CARMA) has been providing online webcasts led by topic experts on contemporary methodological issues since 2004. This paper provides an evaluation and categorization of the 92 webcasts produced during CARMA's first decade to facilitate the incorporation of webcasts into doctoral-level methods training that enhance the depth and breadth of doctoral students' exposure to research methods.

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## 1. Introduction

The lasting success of the field of management hinges on its ability to ask and investigate research questions of scholarly and practical interest (Bettis & Hitt, 1995; Hoskisson, Hitt, Wan, & Yiu, 1999), which itself depends on the rigor of the research designs used to address these questions (Bettis, 1991; Corner, 2002; Cosier, 1983; Daft & Buenger, 1990; Daft & Lewin, 1990; Daft, 1980; Ketchen, Boyd, & Bergh, 2008). Yet, management research as a whole evidences a general stagnation in the types of research methodologies used (Landis & Cortina, 2015; Scandura & Williams, 2000; Stone-Romero, Weaver, & Glenar, 1995), likely caused by researchers' comfort with the methods they know and have previously used for successful publications (Harlos, Mallon, Stablein, & Jones, 2003; Podsakoff & Dalton, 1987). Addressing this problem and proliferating the methods used in management research requires changes in doctoral education to ensure that researchers gain more familiarity and competence with a wide variety of methodologies (Aguinis, Pierce, Bosco, & Muslin, 2009; Ambuske, Locke, & Manning, 1988; Camerer & Fahey, 1988; Hitt, Gimeno, & Hoskisson, 1998).

Although the question of why doctoral students need deeper knowledge about a wider variety of methods has been addressed (Summer et al., 1990), the question of how doctoral students should gain the variety of research experience they need to further their careers (Mello, Fleisher, & Woehr, 2015) has received less scholarly attention (Shook, Ketchen, Cycyota, & Crockett, 2003). One option is the use of web-based research methods seminars provided by the Consortium for the

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Advancement of Research Methods and Analysis (CARMA). CARMA offers a comprehensive set of such seminars for management and organization scholars through an ongoing series of live webcasts as well as a recorded library of past webcasts.<sup>1</sup> Business school curricula are increasingly incorporating web-based instructional technology and communication options (Martins & Kellermanns, 2004), and online compendia such as the CARMA webcast library offer an opportunity to expand these types of resources to the doctoral level of management education. These webcasts are a potentially valuable source of research methods information and support for doctoral advisors, faculty, and students who seek to gain understanding and expertise across the scope of research methods necessary to advance the field of management (e.g., Hitt et al., 1998; Summer et al., 1990), yet the current structure of adding webcasts to a growing archive without a categorization system limits the impact that this resource can have. This paper documents two approaches for incorporating webcasts into doctoral education to develop breadth of knowledge and in-depth proficiency in research methods. The recommendations and resulting structures, derived from our coding of the 92 webcasts offered during CARMA's first decade of webcasts, are designed to help faculty and students determine which webcasts will be most useful in achieving their program objectives.

### 1.1. Literature review

Research training has been and remains a major component of doctoral education (McCaskey, 1975; Mitchell, 2007) and the ability to publish impactful empirical research is the cornerstone of many academic careers in management. As a relatively young field, management has enjoyed explosive growth across many disciplines (Ferris, Ketchen, & Buckley, 2008; Hitt et al., 1998; Meyer, 1991; Zammuto & Connolly, 1984); however, the variety of research streams contained within the field of management and the diversity of methodologies used to address questions in those research streams has remained relatively stable (Austin, Scherbaum, & Mahlman, 2002; Scandura & Williams, 2000). Summer and colleagues' (1990) seminal report on the state of the strategic management field notes that longitudinal, qualitative, and interview-based methodologies in particular could offer novel and essential research insights. The growing need for understanding and incorporating new methodologies led their task force of management researchers to recommend that doctoral students gain an appreciation for a wide variety of methods as well as expertise in a method specialized to their research interests. Bettis (1991) offers similar advice, suggesting that methodological diversity is a vital component of positive change in the management field. Other management scholars (Hitt et al., 1998) added that research methods that incorporate panel data, event histories, network-based, logistic, and Poisson analyses could also offer promising avenues for future research in strategic management and encouraged doctoral students to further strategic management knowledge by developing their understanding of these methods and analytic tools. Despite calls from top research journals for more rigorous and varied research designs (Bansal & Corley, 2011; Daft & Lewin, 1990; Lee, 2001), the state of management research is such that "the adoption of novel methodological practices is very slow" (Aguinis et al., 2009, p. 7).

Overall, the research methods used in strategic management articles have not proliferated as predicted, which is a delay attributed to the research methods training offered during doctoral education (Shook et al., 2003). Analysis of the research methods published in top management journals (Blevins, Tsang, & Spain, 2015) further illustrates this effect by demonstrating that most students are familiar with regression techniques but lack the ability to recognize the need for more specialized techniques. An examination of the publications in *Organizational Research Methods* (ORM) during its first decade reports similar findings and attributions (Aguinis et al., 2009). The most highly-cited ORM topics relate to the same designs noted in previous studies (e.g., Podsakoff & Dalton, 1987; Scandura & Williams, 2000). Aguinis et al. (2009) conclude that ORM offers some benefit to researchers hoping to hone their skills in mainstream methods, but further effort is needed to ensure that specialized and underrepresented methodologies are employed to answer novel and interesting questions. Collectively, these analyses indicate that Summer et al. (1990) and Hitt et al.'s (1998) advice to doctoral students and faculty regarding research methods training and proliferation may have been easier said than done and that expertise in novel techniques may not develop solely from reading methods-focused journals.

Given the many roles that faculty are expected to fulfill during doctoral supervision (Wright, Murray, & Geale, 2007), the methods training that individual faculty can offer may be insufficient for the research demands of a contemporary academic career (Bettis, 2012; Lahenius, 2012). The CARMA webcast library is one resource that can supplement traditional methods coursework by introducing doctoral students to a broad array of research methods experts. As such, these webcasts can improve methodological training to advance the field of management.

### 1.2. CARMA overview

CARMA provides continuing education on research methods and data analysis from introductory to advanced levels and serves as a resource for those who teach research methods and data analysis in management and organizational science ("About CARMA", 2016). A core resource through which they offer education is their library of online webcasts conducted by research methods experts. Each webcast is approximately one hour long and focuses on the presenter's area of expertise. Webcasts commonly contain examples of how and when to use particular research methods techniques, links to datasets,

<sup>1</sup> None of the authors are directly affiliated with the Center for the Advancement of Research Methods and Analysis (CARMA). For more information about CARMA, please consult their website at <http://und.edu/carma/>.

descriptions of statistical software programs, and additional resources for further study. These presentations are broadcast live via the Internet to member schools and are also recorded and archived into an online library for members to view at their convenience. The ninety-two webcasts filmed over the first ten years of CARMA's webcasting history cover a variety of research methods topics, including both quantitative and qualitative analyses as well as theoretical and measurement issues within the broader field of organization science.

Although the CARMA webcast library offers a wealth of resources, its growing catalog poses a number of issues for students and faculty interested in incorporating these webcasts into their doctoral curriculum. First, in the absence of a categorization system, determining which webcasts would be most useful to doctoral students can be difficult. Students and faculty must either rely on webcast session titles or preview numerous webcasts to determine the suitability of each session for a particular course or research methods situation. Second, because some topics have been the focus of more than one webcast over CARMA's history (e.g., interaction effects, structural equation modeling), students or faculty may also have trouble determining which webcast to watch in order to make the best use of their time. These issues are consistent with wider challenges in the field of management education, especially related to organizing, locating, and accessing relevant online resources (Lim, Qing, & Eyring, 2014). To address the challenges of incorporating CARMA into doctoral education, a team of doctoral students at a large Southeastern university in the United States identified and organizing the CARMA webcast library by viewing, categorizing, and rating each webcast from the first ten years of the online webcast catalog. The following section describes this data collection system, the coding and rating processes, and their implications for doctoral-level research methods education.

## 2. Developing a categorization system for CARMA webcasts

In general, research on methods education in post-graduate education suggests that teaching research methods is complex (Braguglia & Jackson, 2012; Deem & Lucas, 2006) and support for instructors is spread across disciplines and journals (Wagner, Garner, & Kawulich, 2011). Consequently, research methods educators design their courses from peer advice and trial and error (Earley, 2014), which creates idiosyncratic student experiences and comfort levels with different research methods. To encourage consistency in methods classes, pedagogical research has encouraged the use of varied learning environments to support students with diverse and disparate levels of familiarity with statistics and methods (Lie & Cano, 2001). Across learning environments, the use of supplemental videos has been found to be effective and enjoyable, particularly in regards to instruction about statistics and methodologies (Lei, 2008; Suanpang, Petocz, & Kalceff, 2004).

Consequently, the CARMA webcasts were used at one large Southeastern university in a number of ways, including as a key component of a doctoral seminar on advanced research methods, as homework for a psychometrics course, and as the focus of ad-hoc research presentations. The variety and repetition of these experiences across different learning environments were designed into the program to increase understanding based on scholarly advice and encouragement for doctoral studies (Lahenius, 2012; Mello et al., 2015; Summer et al., 1990). Across the program, instructors chose which webcasts to show on the basis of: 1) their familiarity with the speaker; 2) their familiarity with the topic; or 3) which webcast was being broadcast live during the seminar meeting time. Although this system provided students with some exposure to the CARMA webcast program, the approach lacked systematic structure.

Under the guidance of research methods experts on the faculty, a team of second- and third-year doctoral students designed a program to code all of the webcasts to identify which webcasts would be most useful to students entering a broad-based management doctoral program. In discussions with other faculty and students familiar with CARMA's offerings, four codes were developed to assess each webcast: content, recommended level of statistics expertise, utility, and clarity. Each code was specified and refined in conversations between doctoral faculty and students before coding began, and the agreed-upon codes were explained in detail to each coder before they began viewing webcasts. The coding sheet is provided in [Appendix A](#).

## 3. Coding dimensions

### 3.1. Content

This nominal code denotes the type of content presented within the webcast. The code was inductively developed and refined over the course of viewing the webcast series. This iterative process resulted in the following content codes: quantitative method, qualitative method, measurement, research design, or conceptual issues. Because titles are not always directly indicative of the webcast content (e.g., "Review of Research Methods in Organizational Studies") coders also used an open-ended response field to describe the topic of the webcast (e.g., meta-analysis, regression, etc.) and to group each webcast with others based on content.

### 3.2. Level of expertise

This nominal code denotes the level of training a doctoral student would likely need to glean useful information from the webcast. Some of the webcast topics were either review-based or broad enough to be intuitively helpful to anyone, while other more technical webcasts presumed a certain level of understanding related to statistics, research methods, or particular

software packages. Codes for this dimension indicated what level of expertise a viewer would need to understand the webcast: novice, competent, intermediate, advanced, or expert.

### 3.3. Utility

This interval code denotes the degree of usefulness that a particular webcast would provide to another student within a broad-based management doctoral program. Coders approached this dimension with an understanding of the types of research commonly conducted within micro- and macro-level areas of management research. This dimension was rated on a five-point scale, with five representing the highest level of utility.

### 3.4. Clarity

This interval code denotes the degree of subject clarity that a coder perceived from the presentation. Coders were asked to consider their attitudes toward the method (Wise, 1985), which previous literature has indicated as a valid and reliable construct to gather from students (Schau, Stevens, Dauphinee, & Del Vecchio, 1995). Widely, students' attitudes towards statistics have been found to influence their academic performance as well as their future achievement and motivation to perform research in their field (Coetzee & Merwe, 2010; Onwuegbuzie & Wilson, 2003). To provide further definition of this dimension, coders were also asked to consider the extent to which each webcast included additional illustrations, examples, citations, datasets, and other research materials that could influence a viewer's attitude towards the method presented in that webcast. Additionally, coders used the open-ended portion of their coding sheets to provide notes or comments about particular strengths of webcasts related to the way that presenters described their topic. Examples of these types of comments that indicate a high degree of webcast clarity from the perspective of a viewer include, "Unique way to visualize data" or "Useful for researchers wanting to develop their own scale." This dimension was rated on a five-point scale, with five representing the highest level of clarity.

## 4. Data collection process

Data collection proceeded in four waves to capture the first ten years of archived CARMA webcasts and the study design incorporated an approach to collection and coding that would minimize the influence of coding errors or mistakes in coder judgment. All coders worked under the supervision of a research methods expert who has served as an editor and reviewer for many research-methods-focused journals. During the first wave of data collection, four doctoral students independently watched and coded each of the sixty-two CARMA webcasts that had been produced to that point. Immediately after watching each webcast, students coded and rated each webcast on the content, level of expertise required, utility, and clarity dimensions described above. Each subsequent data-gathering wave added ratings for the new webcasts that had been recorded since the end of the previous wave. For the second wave, three additional coders rated the eleven new webcasts that had been archived since the end of the first wave. These coders also independently coded a random selection of webcasts that had already been coded during the first wave to ensure agreement across coders and waves. For the third wave, two additional coders followed the same procedure as the coders in the second wave, rating the ten newest webcasts as well as a sample of older webcasts to assess agreement. Finally, for the fourth wave of data gathering, two of the coders from the first wave, who had since become assistant professors, finalized the data gathering and coding by rating the remaining ten webcasts that had been created during CARMA's first decade of online recordings. Across all waves, nine coders provided ratings. Overall, at least two coders viewed each webcast, with some webcasts coded by up to eight independent coders. The median number of coders for each webcast was five. This system of matching multiple coders across new and older webcasts helped to ensure consistency and reliability as the webcast library grew over the data-collection waves.

Incorporating the data from all nine coders permitted the calculation of agreement statistics across all four waves of data collection and coder agreement was assessed using  $r_{wg}$  statistics for the coded clarity and utility dimensions of each webcast (see James, Demaree, & Wolf, 1984, 1993 for a review of the  $r_{wg}$  statistic). Results indicated an average  $r_{wg}$  of 0.87 (SD = 0.11) for the clarity dimension and an average  $r_{wg}$  of 0.85 (SD = 0.12) for the utility dimension, providing evidence of "strong agreement" (LeBreton & Senter, 2008, p. 836) between raters on both dimensions. These agreement statistics are assessed across the entire pool of available all coders, suggesting that second-year doctoral students are capable of rating webcasts similarly to senior students and assistant professors.

After ensuring strong agreement across coders on these dimensions, each coder's utility and clarity scores for each webcast were summed to create a rating of how beneficial each coder found a particular webcast. For example, if a coder had rated a particular webcast as a 5 for utility and a 5 for clarity, these ratings would be summed to produce the maximum possible rating of 10. These summed ratings were then averaged with the ratings from every other coder who also watched that webcast, resulting in aggregated ratings that ranged from 3.33 to 9.2 across the sample of webcasts. Overall, ratings indicated a relatively high level of clarity and utility, each of which were rated on a five-point scale. Across all coders and ninety-two webcasts, the mean utility rating was 3.34 (SD = 0.77) and the mean clarity rating was 3.5 (SD = 0.69).

## 5. Using CARMA to create breadth of methodological training

Viewers seeking to develop a broad familiarity with topics in the domain of research methods in general are likely to appreciate webcasts on novel topics that are presented clearly and with connections to a the field of organization science as a whole. [Table 1](#) presents the webcast number, title, presenter, and presentation date for the twenty-five presentations with the highest average summed utility and clarity ratings. These webcasts are not focused on any particular topic or sub-discipline of organization science; rather, this table presents the webcasts that are rated most highly on utility and clarity, and students interested in developing a breadth of familiarity with a wide variety of research methods are likely to benefit the most from this structure.

The webcasts listed in [Table 1](#) are those most likely to appeal, spark curiosity, and present a variety of unique topics in approachable ways. Overall, they offer students exposure to a wealth of available methods to answer research questions. The webcasts on this list span quantitative and qualitative topics such as moderated path analysis and member review; micro-, meso-, and macro-level topics such as non-response bias, inter-rater agreement, and meta-analysis; and commonly-used methods in management literature such as regression and structural equation modeling, as well as methods just starting to grow in popularity such as photo-elicitation and social network analysis. These webcasts will prove most useful in broad, introductory methods classes that aim to generate discussion about different methods at a high level. Although students are expected to find linkages between sessions, the webcasts in [Table 1](#) can effectively stand alone rather than requiring an ordered approach to a series of webcasts to best understand a particular topic.

The ratings presented in this table do not imply that other webcasts are not of high quality; the most common reason given for a webcast not being rated in the upper quartile of the sample was the perceived utility for students in a broad management program. An example of this outcome would be [Hollenbeck's \(2006\)](#) presentation on laboratory research. Although raters widely agreed that the webcast was clear and approachable to doctoral students at many levels, its utility rating was low because the coders were at an institution with a broad-based management program that did not emphasize laboratory-based experiments. These types of webcasts, although outstanding in their own right, can make it more difficult for a novice researcher to quickly locate the webcasts that would make the best use of their time.

[Table 1](#) is designed to help students develop a broad understanding of the types of methods and topics that are used and discussed in organizational science. This approach stands in contrast to the following section, which offers a different way to approach rating and structuring the CARMA webcast library to help students gain deeper expertise in specific topics.

## 6. Using CARMA to create depth of methodological training

In addition to rating content across the four main dimensions described above, raters were also asked to use a free-response comment block to name the topic most directly-addressed in each webcast. A second free-response comment block asked raters to group the webcast with others they found similar in content. Across nine raters, these two open-ended

**Table 1**  
Ratings for top 25 CARMA webcasts for management doctoral program.

Webcast #	Presenter	Webcast title	Rating <sup>a</sup>
14	Brass	Issues in social network analysis	9.20
35	Bergh	Strategy and research methods development	8.88
7	Cogliser	Current issues in measurement - Individual level	8.86
36	Pratt	Publishing criteria for qualitative research	8.80
43	Locke	The practice of member review in qualitative research: What happens when they read what we write?	8.80
4	LeBreton	Measures of agreement for group level research	8.71
1	Aguinis	Estimating interaction effects using multiple regression	8.67
33	Sackett	Restriction of range	8.60
41	Meade	Question and context effects in organizational survey data	8.60
56	Newman	Missing data: Problems and prospects	8.50
69	Aguinis	Debunking myths and urban legends about meta-analysis	8.50
10	Dalton	Meta-analysis and strategy research	8.40
20	Rogelberg	Non-responses to organizational surveys	8.33
38	Aguinis	Review of research methods in organizational Studies	8.33
13	Shaver	Testing for mediating variables in management research: Concerns, implications and alternative strategies	8.20
9	Boyd	Current issues in individual, group, and organizational level measurement: Strategic management	8.00
22	Klein	Issues with group measurement	8.00
82	Cunliffe	Crafting qualitative organizational research	8.00
92	Tonidandel	Developments and resources for relative importance analysis	8.00
8	Chen	The conceptualization, measurement, and validation of multilevel constructs	7.80
21	Gelfand	Methodological issues in cross-cultural research	7.80
28	LeBreton	Relative importance of predictors with regression models	7.80
24	Ployhart	Longitudinal data analysis	7.71
60	Priem	Judgment policy analysis	7.71
5	Hofmann	Hierarchical linear modeling	7.67

<sup>a</sup> Average of clarity and utility scores across raters. The highest possible rating a webcast could receive is 10.

responses categorized webcasts into nine topic areas. After comparing across each rater's comments and merging similar topics into coherent groups, the resulting categories were titled: structural equation modeling, meta-analysis, regression, levels of analysis, research design, measurement, longitudinal data analysis, state of the field, and qualitative research.<sup>2</sup>

As a result of this process, eighty of the ninety-two coded webcasts were grouped into the nine categories. To ensure that a category provided enough information to help students develop expertise in an area, a category had to consist of at least five webcasts. Some webcasts were relevant to multiple categories and others did not fit into any of larger the categories. As a result, some webcasts appear on multiple lists because their topics are related to more than one category, such as Vandenberg's (2006) "Multi-level Structural Equation Methods," which is included in the topic areas for levels of analysis as well as structural equation modeling. Thirteen of the ninety-two webcasts were not classified in Table 2 because of their specialized topic matter. This in no way reduces their value; in fact, the most useful webcast from Table 1 (Brass, 2006) did not appear on Table 2 because so few other webcasts addressed social network analysis. In an effort to create topic sequences aimed at developing depth of research expertise, these standalone webcasts were excluded from Table 2.

After compiling the categories, webcasts were ordered in each category by the level of expertise a viewer would need to reap the greatest benefit. Thus, the lists produced in Table 2 entail the categories of common methodological topics presented in CARMA in recommended viewing order from novice to expert viewer. For example, the Structural Equation Modeling (SEM) topic area contains 11 titles ordered from an intermediate level (2.5 expertise rating), to an advanced level (4.0 expertise rating) for more experienced scholars. Similarly, the topic of meta-analysis includes a series of 5 webcasts that are rank-ordered according to their level of recommended expertise level that ranges from the novice level (1.5 expertise rating) to the advanced level (4.0 expertise rating).

The curated lists presented in Table 2 provide direction for students looking to deepen their understanding of specific topics, design their own studies, or embark on a dissertation that requires a particular research method that may not be offered at their institution. Within each list, the webcasts include overviews of the methods appropriate for beginning users, issues to consider for users designing research studies, guidance for analyzing data, and advice for publication. Additionally, because these webcasts are grouped by content area and ordered by expertise level required, doctoral faculty engaged in teaching research methods courses can also look to the webcasts within each category to supplement specific courses (e.g., structural equation modeling, qualitative methods) that are focused on that method or topic. In this way, Table 2 provides faculty with guidance in terms of which webcasts will be the most beneficial to incorporate based on whether a course is designed for students who are at the novice, intermediate, or expert level. To make use of the categorizations in Table 2, a statistics or research methods course focused on linear regression methods could use the webcasts in the regression category to frame in-class discussion or to provide out-of-class homework assignments. Likewise, a seminar on longitudinal data analysis could use that category's ordered series of webcasts to support students as they begin to learn the craft of empirical research.

In sum, Table 2 is designed to support the cultivation of deep knowledge on specific research methods. Although the particular selection of webcasts ultimately incorporated into specific courses or programs will be determined by the unique requirements of each doctoral program, the categories and ordering presented in Table 2 provide a useful starting point for students and faculty alike.

## 7. Discussion

Since the Committee on the Future of Doctoral Education's groundbreaking report on the state of the management field (Summer et al., 1990), there has been less methodological progress than predicted (Aguinis et al., 2009; Shook et al., 2003). Some of this shortfall comes from the training offered in doctoral programs and one potential solution to begin to close this gap can come from the library of CARMA webcasts. These webcasts are produced and made available with the express aim of disseminating current developments in research methods to students and scholars at all career stages and acting as a resource for faculty responsible for methods training. This study helps to bridge the apparent competency gap in methods training and application by offering structure and guidance to the large number of webcasts housed in the CARMA library. Together, Tables 1 and 2 represent two ways that doctoral programs can incorporate CARMA webcasts to enhance methodological competency. Time pressures for doctoral students necessitate a refined list of webcasts that are tailored to their research areas and interests. Organizing and categorizing the library of CARMA webcasts in these two different ways facilitates its expanded use, regardless of whether learning goals are focused on pursuing a broad understanding of the organizational science research methods domain or are instead focused on building deeper skills in a specific content area.

Specifically, this paper presents a means through which students can familiarize themselves with many research methods. The use of these webcasts can promote methodological diversity, which can be particularly beneficial for encouraging the use of lesser-known methods in future studies and increasing the creativity of research questions in management (Bettis, 1991; Daft & Buenger, 1990; Daft & Lewin, 1990; Van Maanen, 1979). Further, it suggests a path to develop expertise in specific methodological techniques. This can help students to overcome the limitations of available faculty time and expertise and to apply best-practice advances in methodologies to their dissertations and future research projects.

<sup>2</sup> Although "qualitative" is an umbrella term often used to reference a wide body of methods (Guba & Lincoln, 1994), many of the topics presented in this category were found to apply across these individual methods; thus, we retained the qualitative category despite the constellation of methods it includes.

**Table 2**  
CARMA webcast groupings by topic and recommended expertise level.

Webcast #	Presenter	Title	Expertise
<b>Research design</b>			
19	Stanton	Issues with Internet data collection	1
20	Rogelberg	Non-responses to organizational surveys	1.67
41	Meade	Question and context effects in organizational survey data	1.8
31	James	Conditional reasoning and personality measurement	2
71	Carlson	Control variables and multicollinearity: Things we thought we knew	2.3
16	Murphy	Power analysis for traditional and modern hypothesis tests	2.33
56	Newman	Missing data: Problems and prospects	2.5
74	Hitt	Theoretical specification and methodological rigor: Matching theory and methods	3.5
<b>Measurement</b>			
77	James	Conditional reasoning and the measurement of power	1.5
40	Weiss	Measurement of affect and episodic events	1.8
33	Sackett	Restriction of range	2.4
52	Wiseman	The use and misuse of ratio measures	2.5
67	Johnson	Assessing the validity of higher-order multidimensional constructs	2.75
70	Oswald	Practical issues in developing a measure	3
32	Millsap	Measurement invariance and applied research	3
37	Williams	Measurement models for linking latent variables and indicators: A review of alternatives for organizational researchers	3.75
23	Schmitt	Item response theory	3.8
47	Burke	Estimating confidence intervals for correlations corrected for unreliability and range restriction	4
42	Westfall	Joint analysis of multiple categorical dependent variables	4.2
91	Zickar	Modeling polytomous data	4.5
<b>State of the Field</b>			
38	Aguinis	Review of research methods in organizational studies	1.5
35	Bergh	Strategy and research methods development	1.63
80	Floyd	Rediscovering the individual in strategy research	2
66	Reichardt	Lies my statistics/methods teacher taught me	2.3
85	Vandenberg	Statistical and methodological myths and urban legends	3.5
<b>Levels of Analysis</b>			
90	Chen	Multilevel organizational research: Where we've been, and where we are heading	1.5
7	Cogliser	Current issues in measurement - Individual level	1.6
45	Weingart	Dynamic approaches to studying group processes	2
9	Boyd	Current issues in individual, group, and organizational level measurement: Strategic management	2.4
22	Klein	Issues with group measurement	2.5
79	Kozlowski	Methods issues with multilevel dynamics of group/team emergence	2.5
81	Mathieu	Doing teams research: Where, when, how and why?	2.5
8	Chen	The conceptualization, measurement, and validation of multilevel constructs	2.8
4	LeBreton	Measures of agreement for group level research	3.1
5	Hoffmann	Hierarchical linear modeling	3.3
55	Yammarino	Multilevel issues and WABA	3.6
6	Vandenberg	Multilevel structural equation methods	4
87	Shrout	Implementing multilevel analyses of daily diary data	4
<b>Regression-based methods</b>			
13	Shaver	Testing for mediating variables in management research: Concerns, implications, and alternative strategies	2.6
28	LeBreton	Relative importance of predictors with regression models	2.6
1	Aguinis	Estimating interaction effects using multiple regression	2.7
12	Stone-Romero	The world is flat, the Earth is the center of the universe, and mediating effects can be tested using data from nonexperimental research	2.7
62	DeShon	Multivariate dynamics	2.8
49	MacKinnon	Mediation analysis	3
18	Starbuck	Robust regression	3.2
17	Harrison	Regression models for limited range dependent variables	3.5
84	Cortina	Moderated mediation	3.5
92	Tonidandel	Developments and resources for relative importance analysis	3.5
46	Bowen	Using the censored regression model (tobit) in management research	3.8
11	Edwards	Methods for integrating moderation and mediation: An analytical framework using moderated path analysis	4.2
<b>Structural Equation Modeling</b>			
78	Landis	Meta-analysis and structural equation modeling	2.5
50	Bollen	The meaning of latent variables in social and behavioral science research	2.67
63	Bentler	Formative vs reflective measurement in structural equation modeling	2.8
73	Hoyle	Modeling longitudinal data using structural equation methods	3
27	Cortina	Goodness of fit and structural equation models	3.7
51	Bandalo	Detecting and diagnosing model misspecification	3.7
54	Hancock	Mean structure models with latent variables	3.8
58	Williams	New approaches for evaluating latent variable relations	3.8

Table 2 (continued)

Webcast #	Presenter	Title	Expertise
2	Edwards	Moderation in structural equation modeling: Specification, estimation, and interpretation using quadratic structural equations	4
6	Vandenburg	Multilevel structural equation methods	4
57	Williams	Marker variables and method variance: Models and processes	4
<b>Qualitative Methods</b>			
36	Pratt	Publishing criteria for qualitative research	1
88	Bansal	Tips and traps for publishing qualitative research: An editor's perspective	1
43	Locke	The practice of member review in qualitative research: What happens when they read what we write?	1.2
48	Short	Computer-aided text analysis: Tips and techniques	2
75	Smith	Photographs and organizational research: Photo elicitation as a data source	2.5
76	Van Maanen	More tales of the field: Ethnography then and now	2.5
82	Cunliffe	Crafting qualitative organizational research	2.5
89	Corley	Qualitative rigor in inductive organizational research	3
<b>Meta-Analysis</b>			
83	McDaniels	Publication bias and other sensitivity analyses in meta-analysis	1.5
78	Landis	Meta-analysis and structural equation modeling	2.5
69	Aguinis	Debunking myths and urban legends about meta-analysis	2.75
10	Dalton	Meta-analysis and strategy research	3.2
3	James	The effect of criterion reliability on means and interactions in meta-analysis	4
<b>Longitudinal Data Analysis</b>			
24	Ployhart	Longitudinal data analysis	2.1
25	Vandenberg	Latent growth models for longitudinal data	4
26	Mendoza	Repeated measures ANOVA and MANOVA	3.4
30	Hom	Advanced panel methods for strategy research	3.5
34	Bliese	Discontinuous growth models	3.4
53	Borgatti	Simple models for analyzing network change	3.3
73	Hoyle	Modeling longitudinal data using structural equation methods	3
87	Shrout	Implementing multilevel analyses of daily diary data	4
86	Wang	Growth mixture modeling	4.5

## 8. Boundary conditions and suggestions for future research

Although this study makes contributions to enhancing research methods training in doctoral education, boundary conditions should be noted when considering the results. First, Table 1, designed to recommend a webcast program aimed at enhancing breadth of methods training, is most applicable to a doctoral program with a broad focus on management. We acknowledge that doctoral student raters in management programs with different areas of focus may rate them differently. For example, students tasked with rating webcasts from the standpoint of a program with a narrower emphasis on solely micro- or macro-level topics would influence the utility ratings of each webcast and consequently result in a different list. Instead of a broad-based general management doctoral program, students enrolled in a micro-focused doctoral program in organizational behavior or industrial-organizational psychology will likely benefit from webcasts on measurement (Cogliser, 2005), item response theory (Schmitt, 2007), and advances in stress research (Ganster, 2008); all topics that are absent from Table 1 due to their micro-level emphasis. In contrast, students in macro-focused strategic management doctoral programs will likely benefit from webcasts on meta-analysis (Dalton, 2006), panel data analysis (Hom, 2007), and spatial analysis (Doh, 2009). Consequently, the results of this analysis are most generalizable to a broad-based management program rather than specialized or focused programs and the results presented in Table 1 should be compared to a doctoral program's particular goals to assure that selected webcasts will provide topic coverage that meets the needs of the students and the faculty.

Second, every effort was made to categorize the webcasts in Table 2 for viewers seeking a depth of training on specific topics; however, some lists contain topics that could be further dimensionalized depending on a viewer's particular interest. For example, the research design category contains webcasts on Internet data collection (Stanton, 2006) and conditional reasoning (James, 2008). Although these webcasts could be thought-provoking for researchers gathering data on personality through Internet-based surveys, the latter webcasts may not prove as valuable as the former to researchers doing longitudinal, cross-cultural research through Internet-based surveys. When students or instructional faculty need a category of webcasts that could address a particular research question, the categorizations from Table 2 are designed to provide time-saving guidance to students and faculty alike; however, it is not intended to be an authoritative categorization. Thus, viewers should use their own judgment when making use of the categories from Table 2 to be sure that these categories of webcasts will adequately address their personal or instructional goals related to research methods education.

Third, although the two raters in the fourth wave of data gathering had become assistant professors, the nine raters in this study were all students in either the second or third year of their doctoral training when data gathering began. The inclusion of additional faculty raters could generate different results. This would also permit the use and comparison of agreement



statistics between student and faculty assessments. Additionally, the development of a public rating system would allow CARMA members to contribute to and access ratings from the participating members on an ongoing basis.

Finally, raters completed assessments for the first decade of webcasts, those recorded between Fall 2004 and Fall 2013. The CARMA webcast library is an on-going project and additional webcasts have continued to expand the catalog beyond those rated here. Future research opportunities exist to extend the ratings through present day as well as on-going updates of the latest webcasts as they are added. A full description of the rating and analysis method is provided specifically to enable other students and research methods faculty to identify the webcasts that would be most beneficial in their programs.

## 9. Conclusion

To answer the call for greater methodological diversity in management research (Hitt et al., 1998; Ketchen et al., 2008; Shook et al., 2003; Summer et al., 1990), this study offers a solution to a number of issues facing doctoral students who need exposure to a wide variety of research methods. With guidance from the data provided in this paper, the CARMA webcast series can enhance doctoral education by supplementing the research methods experience that doctoral faculty impart to their students. This study makes progress towards the goals established by the Committee on the Future of Doctoral Education (Summer et al., 1990) to expand the management field's focus on novel research methods such that students, faculty, and doctoral coordinators may all benefit from these efforts to incorporate methods training into their curricula.

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## APPENDIX A.1 Coding sheet for CARMA webcasts

Statistics Pre-requisites	A novice PhD student would be able to understand the research methods presented in this webcast	A competent PhD student would be able to understand the research methods presented in this webcast	An intermediate PhD student would be able to understand the research methods presented in this webcast	An advanced PhD student would be able to understand the research methods presented in this webcast	An expert PhD student would be able to understand the research methods presented in this webcast
Presentation Content	The presentation deals mostly with <i>quantitative methods</i> and techniques	The presentation deals mostly with <i>qualitative methods</i> and techniques	The presentation deals mostly with <i>measurement</i> issues	The presentation deals mostly with <i>designing research studies</i>	The presentation deals mostly with <i>conceptual</i> or state-of-the-field issues
Presentation Utility	<i>Not Useful</i> (1) This webcast is <i>not useful</i> for students in this PhD program	<i>Marginally Useful</i> (2) <i>Few students</i> would find this webcast useful, depending on their research methods interests	<i>Useful to Some Students</i> (3) <i>Some students</i> in this PhD program would find this webcast useful	<i>Useful to Most Students</i> (4) <i>Most students</i> in this PhD program would find this webcast useful	<i>Useful to All Students</i> (5) <i>All students</i> in this PhD program should view this webcast
Presentation Clarity	<i>Poor</i> (1) Presentation is nearly impossible to follow. Examples are not clear and the presenter does not provide guidance for additional resources	<i>Fair</i> (2) Webcast requires multiple viewings to fully grasp the concept(s). Presenter goes too fast or does not fully explain concepts before moving on	<i>Average</i> (3) Presentation meets expectations. Presenter uses some examples and a viewer could find additional resources if necessary	<i>Good</i> (4) Presenter provides easy-to-follow guidance for performing the presented research method(s) and some resources for additional study	<i>Excellent</i> (5) Webcast includes a variety of examples that are accessible across research interests and many citations to references for further study

## References

- About CARMA. (2016). Retrieved from <http://und.edu/carma/about/index.cfm>.
- Aguinis, H., Pierce, C. A., Bosco, F. A., & Muslin, I. S. (2009). First decade of organizational research methods: Trends in design, measurement, and data analysis topics. *Organizational Research Methods, 12*, 69–112.
- Ambuske, G., Locke, K., & Manning, M. R. (1988). Replication: One pedagogical approach for teaching research methods. *Journal of Management Education, 12*, 45–53.
- Austin, J. T., Scherbaum, C. A., & Mahlman, R. A. (2002). History of research methods in industrial and organizational psychology: Measurement, design, analysis. In S. G. Rogelberg (Ed.), *Handbook of research methods in industrial and organizational psychology* (pp. 3–33). Malden, MA: Blackwell.

- Bansal, T., & Corley, K. (2011). The coming of age for qualitative research: Embracing the diversity of qualitative methods. *Academy of Management Journal*, 54, 233–237.
- Bettis, R. A. (1991). Strategic management and the straightjacket: An editorial essay. *Organization Science*, 2, 315–319.
- Bettis, R. A. (2012). The search for asterisks: Compromised statistical tests and flawed theories. *Strategic Management Journal*, 33, 108–113.
- Bettis, R. A., & Hitt, M. A. (1995). The new competitive landscape. *Strategic Management Journal*, 16, 7–19.
- Blevins, D. P., Tsang, E. W., & Spain, S. M. (2015). Count-based research in management: Suggestions for improvement. *Organizational Research Methods*, 18, 47–69.
- Braguglia, K. H., & Jackson, K. A. (2012). Teaching research methodology using a project-based three course sequence critical reflections on practice. *American Journal of Business Education*, 5, 347–352.
- Brass, D. (Presenter). (2006). Issues in social network analysis [Webcast 14]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Camerer, C., & Fahey, L. (1988). The regression paradigm in strategy research: A critical appraisal and suggested directions. In J. Grant (Ed.), *Strategic management Frontiers* (pp. 443–459). Greenwich, CT: JAI Press.
- Coetzee, S., & Merwe, P. V. D. (2010). Industrial psychology students' attitudes towards statistics. *SA Journal of Industrial Psychology*, 36(1), 1–8.
- Cogliser, C. (Presenter). (2005). Current issues in measurement - individual level [Webcast 7]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Corner, P. D. (2002). An integrative model for teaching quantitative research design. *Journal of Management Education*, 26, 671–692.
- Cosier, R. A. (1983). Approaches for the experimental examination of the dialectic. *Strategic Management Journal*, 4, 79–84.
- Daft, R. L. (1980). The evolution of organization analysis in ASQ, 1959–1979. *Administrative Science Quarterly*, 25, 623–636.
- Daft, R. L., & Buenger, V. (1990). Hitching a ride on a fast train to nowhere: The past and future of strategic management research. In J. W. Fredrickson (Ed.), *Perspectives on strategic management* (pp. 81–103). New York: Harper Business.
- Daft, R. L., & Lewin, A. Y. (1990). Can organization studies begin to break out of the normal science straitjacket? an editorial essay. *Organization Science*, 1, 1–9.
- Dalton, D. R. (Presenter). (2006). Meta-analysis and strategy research [Webcast 10]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Deem, R., & Lucas, L. (2006). Learning about research: Exploring the learning and teaching/research relationship amongst educational practitioners studying in higher education. *Teaching in Higher Education*, 11, 1–18.
- Doh, J. (Presenter). (2009). Using spatial analysis in strategy research [Webcast 44]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Earley, M. A. (2014). A synthesis of the literature on research methods education. *Teaching in Higher Education*, 19, 242–253.
- Ferris, G. R., Ketchen, D. J., & Buckley, M. R. (2008). Making a life in the organizational sciences: No one ever said it was going to be easy. *Journal of Organizational Behavior*, 29, 741–753.
- Ganster, D. (Presenter). (2008). Issues in stress research. [Webcast 39] CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). Thousand Oaks, CA: Sage.
- Harlos, K. P., Mallon, M., Stablein, R., & Jones, C. (2003). Teaching qualitative methods in management classrooms. *Journal of Management Education*, 27, 304–322.
- Hitt, M. A., Gimeno, J., & Hoskisson, R. E. (1998). Current and future research methods in strategic management. *Organizational Research Methods*, 1, 6–44.
- Hollenbeck, J. (Presenter). (2006). Contributing to applied psychology with laboratory research [Webcast 15]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Hom, P. (Presenter). (2007). Advanced panel methods for strategy research [Webcast 30]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Hoskisson, R. E., Hitt, M. A., Wan, W. P., & Yiu, D. (1999). Theory and research in strategic management: Swings of a pendulum. *Journal of Management*, 25, 417–456.
- James, L. (Presenter). (2008). Conditional reasoning and personality measurement [Webcast 31]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology*, 69, 85–98.
- James, L. R., Demaree, R. G., & Wolf, G. (1993).  $r_{wg}$ : An assessment of within-group interrater agreement. *Journal of Applied Psychology*, 78, 306–309.
- Ketchen, D. J., Boyd, B. K., & Bergh, D. D. (2008). Research methodology in strategic management: Past accomplishments and future challenges. *Organizational Research Methods*, 11, 643–658.
- Lahenius, K. (2012). Communities of practice supporting doctoral studies. *The International Journal of Management Education*, 10, 29–38.
- Landis, R. S., & Cortina, J. M. (2015). Is ours a hard science (and do we care)? In C. E. Lance, & R. J. Vandenberg (Eds.), *More statistical and methodological myths and urban legends* (pp. 9–35). New York: Routledge.
- LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods*, 11, 815–852.
- Lee, T. W. (2001). On qualitative research at AMJ. *Academy of Management Journal*, 44, 215–216.
- Lei, S. A. (2008). Factors changing attitudes of graduate school students toward an introductory research methodology course. *Education*, 128, 667–685.
- Lie, K. G., & Cano, V. (2001). Supporting diverse learners through a website for teaching research methods. *Educational Technology & Society*, 4(3), 50–63.
- Lim, A., Qing, D. C. J., & Eyring, A. R. (2014). Netting the evidence: A review of on-line evidence-based management resources. *Academy of Management Learning & Education*, 13, 495–503.
- Martins, L. L., & Kellermanns, F. W. (2004). A model of business school students' acceptance of a web-based course management system. *Academy of Management Learning & Education*, 3, 7–26.
- McCaskey, M. B. (1975). Training doctoral students in research. *Journal of Management Education*, 1(3), 25–32.
- Mello, A. L., Fleisher, M. S., & Woehr, D. J. (2015). Varieties of research experience: Doctoral student perceptions of preparedness for future success. *The International Journal of Management Education*, 13, 128–140.
- Meyer, A. (1991). What is strategy's distinctive competence? *Journal of Management*, 17, 821–833.
- Mitchell, T. R. (2007). The academic life: Realistic changes needed for business school students and faculty. *Academy of Management Learning & Education*, 6, 236–251.
- Onwuegbuzie, A. J., & Wilson, V. A. (2003). Statistics anxiety: Nature, etiology, antecedents, effects, and treatments—A comprehensive review of the literature. *Teaching in Higher Education*, 8, 195–209.
- Podsakoff, P. M., & Dalton, D. R. (1987). Research methodology in organizational studies. *Journal of Management*, 13, 419–441.
- Scandura, T. A., & Williams, E. A. (2000). Research methodology in management: Current practices, trends, and implications for future research. *Academy of Management Journal*, 43, 1248–1264.
- Schau, C., Stevens, J., Dauphinee, T. L., & Del Vecchio, A. (1995). The development and validation of the survey of attitudes toward statistics. *Educational and Psychological Measurement*, 55, 868–875.
- Schmitt, N. (Presenter). (2007). Item response theory [Webcast 23]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Shook, C. L., Ketchen, D. J., Cycyota, C. S., & Crockett, D. (2003). Data analytic trends and training in strategic management. *Strategic Management Journal*, 24, 1231–1237.
- Stanton, J. (Presenter). (2006). Issues with internet data collection [Webcast 19]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.

- Stone-Romero, E. F., Weaver, A. E., & Glenar, J. L. (1995). Trends in research design and data analytic strategies in organizational research. *Journal of Management*, 21, 141–157.
- Suanpang, P., Petocz, P., & Kalceff, W. (2004). Student attitudes to learning business statistics: Comparison of online and traditional methods. *Educational Technology & Society*, 7(3), 9–20.
- Summer, C. E., Bettis, R. A., Duhaime, I. H., Grant, J. H., Hambrick, D. C., Snow, C. C., et al. (1990). Doctoral education in the field of business policy and strategy. *Journal of Management*, 16, 361–398.
- Van Maanen, J. (1979). Reclaiming qualitative methods for organizational research: A preface. *Administrative Science Quarterly*, 24, 520–526.
- Vandenberg, R. (Presenter). (2006). Multi-level structural equation methods [Webcast 6]. CARMA. Webcast retrieved from <https://razor.med.und.edu/carma/video>.
- Wagner, C., Garner, M., & Kawulich, B. (2011). The state of the art of teaching research methods in the social sciences: Towards a pedagogical culture. *Studies in Higher Education*, 36, 75–88.
- Wise, S. L. (1985). The development and validation of a scale measuring attitudes toward statistics. *Educational and Psychological Measurement*, 45, 401–405.
- Wright, A., Murray, J. P., & Geale, P. (2007). A phenomenographic study of what it means to supervise doctoral students. *Academy of Management Learning & Education*, 6, 458–474.
- Zammuto, R. F., & Connolly, T. (1984). Coping with disciplinary fragmentation. *Organizational Behavior Teaching Review*, 9, 30–37.