ADVANCES IN MIXED METHODS RESEARCH

John W. Creswell, Ph.D.
Adjunct Professor, Family Medicine
Co-Director, Michigan Mixed Methods Research and Scholarship Program
University of Michigan, USA

Take home points:

By the end of this presentation, you will have:

- A basic understanding of mixed methods research
- An understanding of 10 recent advances of this methodology
- Specific examples of these advances
- A checklist of advances to review for your project
Five Essential Characteristics of Mixed Methods Research

• In response to questions/hypotheses, the collection and analysis of **BOTH quantitative and qualitative data**

• The use of **rigorous procedures** in conducting quantitative and qualitative research

• The **integration** (or combination) of the findings from the quantitative results and the qualitative findings

• The development of procedures in which this data collection, analysis, and integration occurs: **mixed methods designs**

• The use of **theory** (and philosophy) as it relates to these procedures
Integration as a Centerpiece for Mixed Methods Research

• Integration separates mixed methods from other research approaches
• Integration suggests “mining” the data further than simply conducting quantitative and qualitative analysis
• Integration can be
  – Described
  – Visualized
  – Scripted for writing

• Mixed methods research can be said to be a methodology framed around the idea of a) gathering both quan and qual data and their analyses and b) integrating or combining the two datasets
My Epistemology Assumptions (How Researchers Gain Knowledge) for using Mixed Methods

• Multiple ways of viewing the world
• Dichotomy exists between quantitative and qualitative data (separate, distinct ways of gathering data)
• Equality of quantitative and qualitative research (privilege both forms)
• Practical approach to research
Thinking this way requires identifying your databases as either quan (closed-ended) or qual (open-ended)

Listing out the two databases separately

Thinking in terms of “mining” the data deeper through combining the datasets

Thinking in terms of how the two datasets together provide added insight

Synergy

1 + 1 = 3 (M. Fetters)
Problem: As Mixed Methods Evolves and Is Used, Fields Differ in their Adaptations and Familiarity with It

Social work
Marketing
Family Science
Veterans Health Services
Research
Family Medicine
Health disparities
Global health

Occupational Therapy
Music Therapy
Counseling Psychology
Second Language Acquisition
Sociology
Psychology
Family Studies
Problem: Many People are Not Reading the Literature about Mixed Methods to Identify the Latest Thinking
Here are 10 Advances in Mixed Methods (last 5 years) for You to Incorporate into Your Project

- Include information about your quantitative, qualitative, and mixed methods skills
- Create study aims for the quantitative, qualitative, and mixed methods components
- Write a justification for using mixed methods
- Advance a mixed methods design for your procedures
- Portray this design with a diagram and/or implementation matrix
- Be specific about your point of integration in your design
- Create joint display tables to show integration and draw inferences
- Select a conceptual framework for your project that links into the design
- Advance mixed methods validity (research integrity) in your design
- Create multiple publications from your mixed methods project
Best Practices for Mixed Methods Research in the Health Sciences

Commissioned by the

Office of Behavioral and Social Sciences Research (OBSSR)
Helen I. Meissner, Ph.D., Office of Behavioral and Social Sciences Research

By

John W. Creswell, Ph.D., University of Nebraska-Lincoln
Ann Carroll Klassen, Ph.D., Drexel University
Vicki L. Plano Clark, Ph.D., University of Nebraska-Lincoln
Katherine Clegg Smith, Ph.D., Johns Hopkins University

With the Assistance of a Specially Appointed Working Group

Source: obssr.od.nih.gov/mixed_methods_research/
Where Do We Find These Advances?

NIH R25  Mixed Methods Research Training Program (MMRTP)

Johns Hopkins, Harvard, University of Michigan

The first 14 of the 46 scholars to be trained in the next three years
Where Do We Find These Advances?
APA Qualitative Article Reporting Standards (QARS)

Current Task Force Developing Standards:

- Qualitative Research
- Qualitative Meta-Synthesis Research
- Mixed Methods Research

Will report at APA Conference (2016) and possibly in American Psychologist
Where Do We Find These Advances?
Recent books

Based on my Harvard master class lectures, 2013

Include Information About Your Skills

1) Your personal skills in quantitative, qualitative, and mixed methods research
2) Skills possessed by members of your “mixed methods team”
What We Know About Skills

• Include investigator skills in proposals
• Possess three categories of skills: quantitative, qualitative, and mixed methods research skills

Advances

• Have multiple ways to learn mixed methods research
• Have an instrument to assess your readiness and skill components
• Have a good understanding of mixed methods team dynamics
Learning Mixed Methods

- Courses – residence and on-line
- Books – about 30 available now
- Workshops – such as this one
- Apprentice with a mixed methods scholar – NIH R 25 mentor-scholar
- Training programs (NIH, Michigan)
You Can Assess Your Readiness for Mixed Methods (Guetterman instrument)

Topics:

- Professional Experiences
- Personal Characteristics
- Mixed Methods Knowledge
- Mixed Methods Skills

Mixed Methods Team Dynamics

- Build a **capacity of team members** to articulate their philosophy, visions, values, and research goals
- **Facilitate group interactions** to create conditions for values-sharing dialogue, setting goals, and developing trust
- Systematically optimize values that support dialectical pluralism conditions and **communities of practice**

Create Quantitative, Qualitative, and Mixed Methods Study Aims

Study aims = purpose, objectives, intent, goals
What We Know about Study Aims

- Include 3 aims in a MM study: quan, qual, mixed
- MM aim conveys what we want to accomplish with integrating the databases
- Can also go beyond the three: implementation, dissemination aims

Advances

- Linking mixed methods aim into design
- Writing the mixed methods aim following content then methods
Linking the Mixed Methods Aim to the Design

• To **compare** the qualitative interviews about the elderly’s self-esteem with their perceptions on a survey about their self-esteem. (Convergent Design)

• To **explain** the results from the survey about self-esteem with the elderly with qualitative focus groups. (Explanatory Sequential Design)

• To **explore** the meaning of self-esteem for the elderly, to develop a survey based on their qualitative interviews, and then to administer the contextually-specific survey. (Exploratory Sequential Design)
Writing the Aims Based on Content-Methods Order

• Template =
  Content followed by methods (Best Practices, 2011)

Example (Explanatory Sequential Design Example):
1. Relate personal isolation to depression among older adults based on survey data. (QUAN aim)
2. Explain how personal isolation affects depression among older adults by obtaining personal experiences. (MIXED METHODS aim)
3. Explore personal isolation among older adults using semi-structured interviews. (QUAL aim)
4. Develop an intervention (experiment) to compare different groups of isolated older adults (FUTURE RESEARCH aim)
Write a Justification for Using Mixed Methods

“Justify” (or rationale or reason): (a) our use of the importance of collecting both quantitative and qualitative data and (b) why integration in our design is important.
What We Know about Justification

• Essential to justify use of mixed methods today
• Is called “reason” or “rationale” in mixed methods literature
• Many justifications available in the literature (Bryman, 2006)
• Need to justify a) why you are collecting quantitative and qualitative data b) why integration is important

Advances

• Create a justification that matches your design
• Be aware of special words (and scripts) to describe justifications
Writing Justification Statements

• “The qualitative (focus group) data enriched the survey results and provided a deeper understanding of the social context of Internet use... (Quan-Hasse, 2007, p. 673). (Convergent Design)

• “Such use of the results from a qualitative study to inform a survey is said to enhance the sensitivity and accuracy of the survey questions. (Jones-Harris, 2010, p.3). (Exploratory Seq. Design)

• “Quantitative and qualitative methods can be used together to give a more powerful voice to women’s experiences. (Hodgkin, 2008, p. 299) (Mixed Methods Feminist Design)

Justification Scripts

Type of Design
• Convergent Design
• Explanatory Sequential Design
• Exploratory Sequential Design

Words to Use
• “compare” “merge” “contrast” “validate”
• “explain” “follow-up” “understand mechanisms”
• “develop,” “design,” “build”
Mixed methods designs are procedures for conducting a study (mixed methods equivalent to RCTs in quantitative research or ethnographies in qualitative research).
What We Know about Designs

- Widely discussed in MM literature
- Many typologies (Creswell & Plano Clark, 2011)
- Confusing array of possibilities
- Emerging discussions about designs in literature

Advances

- Have conceptualized designs into 3 core designs and many applications (RCT, use of theory, methods)
- See design as lynchpin to link to many aspects of research process (e.g. no longer talk about “validity” generally, but within a particular design)
A Convergent Design

Phase 1

Intent: To compare results from both databases

Qualitative Data Collection and Analysis

Quantitative Data Collection and Analysis

Merge

Interpretation

Core Design
Quantitative Data Collection and Analysis

Phase 1

Explained by

Qualitative Data Collection and Analysis

Phase 2

Interpretation

Intent: Use the qualitative data to help explain the quantitative results
Phase 1
- Qualitative Data Collection and Analysis
- Quantitative Phase – Instrument design or intervention design

Phase 2
- Builds into
- Interpretation
- Quantitative Phase – Instrument design, new variables, or intervention activities

Phase 3
Intent: To explore first before building to a quantitative phase
Intersection of Core Designs with Complex Applications

What type of applications? (Plano Clark & Ivankova, 2016)

- Embedding within a design: e.g., experiment or intervention trial
- Included with another methodology: e.g., evaluations, network analysis
- Included with a theoretical perspective: e.g., feminist theory, CBPR

What are some characteristics of these (complex) applications? (Nastasi & Hitchcock, 2016)

Typically:

- Multiple research phases
- Multiyear research projects
- Large funded projects
- Multiple researchers
- Inclusion of mixed methods basic designs within different phases of research

CONVERGENT DESIGN

EXPLANATORY SEQUENTIAL DESIGN

EXPLORATORY SEQUENTIAL DESIGN

Intervention Trial

Community-Based Participatory Research/Social Justice

Program Evaluation

App, Survey

Multiple Case Study
Mixed Methods Designs Have Opened Up Discussions about the Entire Research Process

Rationale/Problem/Questions

Type of Design

- How to determine the type of integration
- How to describe methodological/validity issues of design
- How to determine the type of design
- When to use theory in a design
- How to write mixed methods study aims/questions
- How to compose the writing of a mixed methods study
- How to portray integration in a study (joint display)
- How to write a mixed methods title
- How to choose a type of mixed methods design
- How to draw a sophisticated diagram of a mixed methods design

Portray Your Design with a **Diagram** and/or an **Implementation Matrix**

Visual pictures of the procedures in our mixed methods projects
What We Know About Diagrams

- Useful for project presentations to teams, stakeholders, proposal reviewers, graduate committees
- Have examples in the literature from early 1990s
- Suggested by funding agencies to best understand projects

Advances

- Have added to “methods” diagrams “content” features
- Have added elements into diagrams (e.g., time, colors, etc.)
- Have added implementation matrix to portray project process and outcomes
A “Methods” Diagram with Phases, Procedures, Products

The Longitudinal study of war-affected youth in Sierra Leone (LSWAY) examines trajectories of psychosocial adjustment among N=529 male and female survivors of Sierra Leone’s civil war.

**PRELIMINARY EVIDENCE**

**QUANT**


**QUAL**

In-depth interviews/narratives of youth (N = 30) conducted in 2008 to illuminate processes shaping risky and resilient trajectories.

**MERGE THE RESULTS**

Findings inform next phase of qualitative data collection for intervention development.

Conduct qualitative key informant (KI) interviews in 2010 with experts from youth serving organizations, war-affected youth and caregivers, about current problems of war-affected youth. Identify key themes emerging from qualitative data around symptoms and functional impairments and sources of resilience characterizing war-affected youth. **QUAL** findings used to design group-based mental health intervention.

Implement culturally relevant intervention; evaluate using a single group, pre- and post-test experimental design to assess mental health and functional impairments.

Conduct qualitative follow-up assessments of feasibility and acceptability and post intervention assessments of satisfaction.

**A “Content” and Methods Diagram**

CASE ANALYSIS USA

PROCEDURES
- Comparative thematic analysis
- Cross-cultural comparison
- Interpretation of findings

PRODUCTS
- Description of methods
- Comparative analysis
- Quantitative and qualitative data

CASE ANALYSIS COLOMBIA

PROCEDURES
- Comparative thematic analysis
- Cross-cultural comparison
- Interpretation of findings

PRODUCTS
- Description of methods
- Comparative analysis
- Quantitative and qualitative data

Figure 1. Feeding Practices of Families and Teachers with Preschoolers in Colombia and U.S.: A Cross-cultural Multiple Case Study

### A Sample Implementation Matrix (Table)

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Sample</th>
<th>Goal</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structured, standardized interviews</td>
<td>Stratified random sample (based on depressive symptoms) of older adult patients from non-academic primary care settings</td>
<td>Assess depressive symptom patterns and correlates</td>
<td>Multivariate regression models</td>
</tr>
<tr>
<td>Semi-structured interviews</td>
<td>Purposive: 50 African American and 50 white adults from Spectrum sample (who may or may not be depressed)</td>
<td>Identify an explanatory model for depression</td>
<td>Grounded theory</td>
</tr>
<tr>
<td>Free listing and pile sorts</td>
<td>First 25 African American and 25 white adults selected above for semi-structured interviews for free listing. Second 25 African American and 25 white adults selected above for pile sorts</td>
<td>Identify the domain of depression and its characteristics</td>
<td>Cultural consensus analysis</td>
</tr>
<tr>
<td>Ethnographic discourse-centered analysis</td>
<td>Purposive: Another 15 African American and 15 white adults who are depressed based on survey responses from the Spectrum sample</td>
<td>Identify social meaning of depression</td>
<td>Discourse analysis</td>
</tr>
</tbody>
</table>

Be Specific about Your Integration

Integration = INTERSECTION of qualitative and quantitative data (Plano Clark & Ivankova, 2016)
What We Know about Integration

• Represents a defining, unique methodological feature of MM
• Not clearly understood (Bryman, 2006) (e.g., how do you mix numbers with text?)

Advances

• Know about integration types: connecting, building, merging, embedding (Fetters, Curry, & Creswell, 2013)
• Can locate integration (point of interface) in our designs (Morse & Niehaus, 2009)
  Where does the quantitative data bump up against the qualitative data?
• Have scripts to write it into your proposal/application

When we mix up the batter for the cake...

The **flour** blends (merges) in the batter and disappears in its original form. This is integration.

The **raisins** are mixed into the cake. We are “connecting” or “embedding” the raisins in the batter. The raisins stay intact. This is integration.
Quantitative Data Collection and Analysis

Qualitative Data Collection and Analysis Explained by

Explanatory Sequential Design

Phase 1
Quantitative Data Collection and Analysis

Point of Integration

Phase 2
Qualitative Data Collection and Analysis

Interpretation

Quantitative results lead to qualitative data collection
Scripts for Mixed Methods Integration Statements

• “Integration involved **merging** the results from the quantitative and qualitative data so that a **comparison** could be made and a more complete understanding emerge than what was provided by the quantitative or the qualitative results alone.” (Convergent Design)

• “Integration involved **connecting** the results from the initial quantitative phase to help plan the follow up qualitative data collection phase. This plan would include what questions need to be further probed and what individuals can help best explain the quantitative results.” (Explanatory Sequential Design)

• “Integration involved gathering initial qualitative data, analyzing it, and then using the qualitative results to **build** a new intervention (or measure or instrument) that will be tested quantitatively.” (Exploratory Sequential Design)
Create Joint Displays to Represent Integration

• Joint displays are ways to represent integration in a results or discussion
  – Shows the intersection of quantitative and qualitative data
  – Presented as a table or a graph
What We Know about Joint Displays

• Recommended by US federal government (“Best Practices”)
• Examples appearing more frequently in mixed methods studies
• Joint displays illustrate integration of the quantitative and qualitative data

Advances

• Have useful, published models of joint displays
• Relate joint displays to the type of design
Example of a Joint Display

### Comparison of Information from Interview and Survey Data: Examples of Four of the Eight Themes

<table>
<thead>
<tr>
<th>Theme</th>
<th>Qual Results</th>
<th>Quant Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How and why child was placed in program</td>
<td>Two aspects of decision:</td>
<td>Parents’ most important reasons for using program:</td>
</tr>
<tr>
<td></td>
<td>(1) Community-based “inclusive” option</td>
<td>Offers special education services or therapies</td>
</tr>
<tr>
<td></td>
<td>(2) Specific child care center</td>
<td>Provides opportunities for child to learn</td>
</tr>
<tr>
<td></td>
<td>Factors affecting choice:</td>
<td>Provides opportunities to play with other children</td>
</tr>
<tr>
<td></td>
<td>Visited and liked classroom &amp; teacher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Convenience of location</td>
<td>90% said very important for child to be in inclusive program</td>
</tr>
<tr>
<td></td>
<td>Flexibility in hours</td>
<td>80% indicated child usually or always receives special services needed</td>
</tr>
<tr>
<td></td>
<td>Good reputation of center</td>
<td>80% were satisfied with way in which child’s educational goals were made</td>
</tr>
<tr>
<td></td>
<td>Concern if center would accept child because of behavior</td>
<td></td>
</tr>
<tr>
<td>2. Program’s appropriateness for child</td>
<td>In successful placement, there is a “match or fit” between child’s and family’s needs &amp; program. Factors affecting match or fit:</td>
<td>The most helpful supports were:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other family members at home</td>
</tr>
<tr>
<td></td>
<td>Characteristics of helpful players:</td>
<td>Child’s teachers</td>
</tr>
<tr>
<td></td>
<td>Consistent presence over time &amp; settings</td>
<td>Other professionals in community and at child’s program</td>
</tr>
<tr>
<td></td>
<td>Personal investment in child</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provides different types of support</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependable source of information about child</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Characteristics of unhelpful players:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minimize or disregard family concerns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inadequate communication</td>
<td></td>
</tr>
<tr>
<td>3. Helpful and unhelpful players</td>
<td>Factors that affect participation:</td>
<td>Limitations on participation:</td>
</tr>
<tr>
<td></td>
<td>Parent’s safety concerns about child</td>
<td>Child’s language skills</td>
</tr>
<tr>
<td></td>
<td>Parent’s perception of what is expected of child’s behavior</td>
<td>Family’s schedule and time constraints</td>
</tr>
<tr>
<td></td>
<td>Lack of other young children in immediate neighborhood</td>
<td>Attitudes of others towards child’s disability</td>
</tr>
<tr>
<td></td>
<td>Family’s own style, schedule, and how it participates in the community</td>
<td>Child’s behavior</td>
</tr>
<tr>
<td></td>
<td>An extended family system was so strong a part of family’s culture that family did not need or choose to participate much in the community</td>
<td>Lack of other children to play with in neighborhood</td>
</tr>
<tr>
<td></td>
<td>Young age of children</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Li et al., 2000, Table 2, pp. 124-125. Reprinted with permission of SAGE Publications, Inc.
Example of Joint Display (Graph)

“Alcohol is an acceptable part of society and all activities.”

“Parents allow their children to go into environments where they know drinking will be going on — they are the key to making things change.”

“It’s not my problem, and I don’t want to get involved in your problems.”

“The bars don’t understand how to serve alcohol responsibly.”
A conceptual framework in a mixed methods study is a framework that provides a general explanation as to what the investigator will find from the results. It can be presented as a conceptual framework, a model, a theory (of varying levels of abstraction), or even a broad philosophy.
What We Know About Conceptual Frameworks

• Important to identify one
• May be composite framework
• Often presented as diagram

Advances

• Have the conceptual framework inform the design
• Use the conceptual framework across quan and qual phases of design
Theory Informing an Explanatory Sequential Design

Explanatory Sequential Mixed Methods Design

Theory of Behavioral Change

Collect/analyze Quantitative Data
- Collect N=250 surveys
- Measure behaviors leading to lowered cholesterol
- Analyze data descriptively and multivariately

Collect/analyze Qualitative Data
- Collect N=30 interviews with patients based on surprising quantitative results
- Code data and identify themes

Integration

Interpret how qualitative results help explain quantitative results

Phase 1

Phase 2
Theory Informing Quan. and Qual. Phases of a Mixed Methods Design

Figure 2

Ecological model of stress-adjustment

Advance Mixed Methods Validity
(Research Integrity)

• Validity in mixed methods research: trust, draw accurate inferences in our interpretation of the MM design
What We Know About Validity

- Report three types of validity in a MM study: a) quantitative b) qualitative and c) mixed methods.

Advances

- Mixed methods – has its own validity, called “legitimation” ” (Onwuegbuzie & Johnson, 2006) or methodological issues (Creswell & Plano Clark, 2011)
- Form of MM validity relates to the design (Campbell & Stanley, 1963)

# Methodological or Validity Issues in Mixed Methods Designs

<table>
<thead>
<tr>
<th>Type of Design</th>
<th>Potential Challenging Points in the Design</th>
</tr>
</thead>
</table>
| Convergent Design                 | • Designing parallel questions  
• Sample size                       
• How to merge data                 
• Conflicting results               |
| Exploratory Sequential Design     | • Qual to quan  
• Rigorous instrument/intervention design                                       |
| Explanatory Sequential Design     | • Quan to qual  
• Qualitative sampling               
• Qualitative follow-up questions  |
| Experimental, Intervention Framework | • How to use qual data In experiment  
• Bias introduced by qual data collection in experiment  |
| Participatory/Social Justice Framework | • Identify social justice lens     
• Involve participants in study     
• Bring about change                |
| Program Evaluation Framework      | • Link one stage to another  
• Keep focus on objectives          |
| Case Study Framework              | • Identify the cases  
• Determine how to integrate data when building cases  |
| Survey Development Framework      | • Create new survey or modify one  
• Qual to quan                      |
Match Validity Issues to Design: Case of Explanatory Sequential Design

Table 1. Eight Issues to Consider when Ensuring Quality of Meta-Inferences in Mixed Methods Sequential QUAN→QUAL Designs.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Use rigorous and systematic procedures for data collection and analysis in quantitative and qualitative study phases to address weakness minimization.</td>
</tr>
<tr>
<td>2.</td>
<td>Apply validation strategies recommended for quantitative and qualitative research approaches in quantitative and qualitative study phases.</td>
</tr>
<tr>
<td>3.</td>
<td>Select participants for qualitative follow-up phase consistent with the overall purpose of the study.</td>
</tr>
<tr>
<td>4.</td>
<td>Use systematic statistically grounded process for selecting participants for qualitative follow-up phase.</td>
</tr>
<tr>
<td>5.</td>
<td>Qualitatively follow up on important results from initial quantitative phase.</td>
</tr>
<tr>
<td>6.</td>
<td>Elaborate on unexpected quantitative results in the qualitative follow-up phase.</td>
</tr>
<tr>
<td>7.</td>
<td>Allow for interaction between qualitative and quantitative study phases.</td>
</tr>
<tr>
<td>8.</td>
<td>Create meta-inferences grounded in both quantitative and qualitative results.</td>
</tr>
</tbody>
</table>

Create Multiple Publications from Your Mixed Methods Project

- Focus on scholarly publications (e.g., journals, reports)
What We Know about Writing and Publishing

- Increased publication rates of mixed methods studies
- Studies can be empirical articles or methodological articles
- More journals opening up to mixed methods
- Word counts of journal may limit mixed methods publications

Advances

- Can create multiple publications (quan, qual, overview, methodological)
- Use templates for structuring the methods
- Use published standards for publication (APA)
Create Multiple Publications from a Project

Qualitative Article

Quantitative Article

Mixed Methods/Integrative (Overview) Article
Use Templates for Your Type of Design

<table>
<thead>
<tr>
<th>Type of Design</th>
<th>Template for Methods Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convergent Design</td>
<td>Methods - separate quan and qual</td>
</tr>
<tr>
<td></td>
<td>Results – separate quan and qual</td>
</tr>
<tr>
<td></td>
<td>Discussion – integration</td>
</tr>
<tr>
<td>Explanatory Sequential Design</td>
<td>Methods – quan first, then qual</td>
</tr>
<tr>
<td></td>
<td>Results and Discussion – quan, results to be explained, qual</td>
</tr>
<tr>
<td>Exploratory Sequential Design</td>
<td>Methods – qual, use of qual, quan</td>
</tr>
<tr>
<td></td>
<td>Results and Discussion – qual, use of qual, quan</td>
</tr>
</tbody>
</table>

### Table 3

**Mixed Methods Article Reporting Standards (MMARS): Information Recommended for Inclusion in Manuscripts that Report both New Qualitative and Quantitative Data Collections**

<table>
<thead>
<tr>
<th>Paper Section or Element</th>
<th>Information to be Reported in Mixed Methods Research</th>
<th>Reporting Notes for Reviewers &amp; Recommendations for Authors to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td>See the QARS and JARS Standards</td>
<td>Recommendation: Refrain from using words that are either qualitative (e.g., explore, understand) or quantitative (e.g., determine, correlate) because mixed methods stand in the middle between qualitative and quantitative research. Recommendation: Reference the term “mixed methods” or “qualitative and quantitative.”</td>
</tr>
<tr>
<td><strong>Cover page</strong></td>
<td>See the QARS and JARS Standards</td>
<td></td>
</tr>
<tr>
<td><strong>Abstract</strong></td>
<td>See the QARS and JARS Standards</td>
<td>Recommendation: Specify the type of mixed methods design used. See the note on types of designs in the methods section below. Recommendation: Consider using one keyword that describes the type of mixed methods design and one that describes the problem addressed.</td>
</tr>
<tr>
<td><strong>Introduction</strong></td>
<td></td>
<td>Recommendation: This section may convey barriers in the literature that suggest a need for both qualitative and quantitative data. Note: Theory or conceptual framework-use in mixed methods varies depending on the specific mixed methods.</td>
</tr>
</tbody>
</table>

**Description of Research Problems/Questions**

- See the QARS and JARS Standards

- Recommendation: This section may convey barriers in the literature that suggest a need for both qualitative and quantitative data.
  - Note: Theory or conceptual framework-use in mixed methods varies depending on the specific mixed methods.
The Flow of a Added Mixed Methods Components in a Publication

**Introduction**
- Justify the need for quantitative and qualitative data and their integration

**Methods**
- Identify type of mixed methods design
- Provide diagram of design procedures
- Present quantitative and qualitative data collection and analysis separately
- Address research integrity of procedures

**Results**
- Report quantitative and qualitative results
- Report mixed methods results (e.g., joint display)

**Discussion**
- Match interpretation to quantitative, qualitative, and mixed methods results

**Appendices**
- Quantitative instruments/qualitative protocols
Summary Checklist for Incorporating Latest Advances into a Mixed Methods Study

Did you:

_____ Discuss your quan, qual, and mixed methods skills?
_____ Give consideration as to how to form a mixed methods team?
_____ Write clear qualitative, quantitative, and mixed methods aims?
_____ Relate your mixed methods aim to your type of design?
_____ Justify the use of mixed methods? And the type of design?
_____ Identify the basic mixed methods design in your project?
_____ Know how the mixed methods basic design might be applied in your project (e.g., evaluation project)
_____ Provide a diagram that incorporates the basic design and your application?
_____ Contain advanced features of drawing the diagram? (e.g., timeline)
_____ Specifically mention integration and how it relates to your type of design?
_____ Represent integration with a joint display and relate it to your type of design?
_____ Use a conceptual framework and link it into your mixed methods design?
_____ Report validity (research integrity) considerations that relate to your type of design?
_____ Craft multiple publications (quan, qual, overview, methodological) from your study?
_____ Use recent guidelines for how to write a mixed methods study for publication? (e.g., APA)
ADVANCES IN MIXED METHODS RESEARCH

John W. Creswell, Ph.D.
Adjunct Professor, Family Medicine
Co-Director, Michigan Mixed Methods Research and Scholarship Program
University of Michigan, USA