

# Joint Displays to Facilitate Integration of Qualitative and Quantitative Research

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August 2019, MMIRA and IIQM Webinar

# Mixed Methods International Research Association (MMIRA)

**Mission:** *To promote an international forum for interdisciplinary mixed methods research. Members are from over 40 countries!*

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**Conferences:** *Trinidad (March 2019); Japan (September 2019); New Zealand (December 2019)*

Discounted membership rates available for students and individuals from developing nations.

- <http://mmira.wildapricot.org/admin/website/?pageId=1514647>




# Overview of Objectives

- Using joint displays as one potential method to facilitate integration
- Selecting a joint display based on design and integration procedures
- Reviewing exemplar joint displays
- Using models to construct a joint display



# Why Joint Displays?

- Emphasis on integration as centerpiece of mixed methods
  - Integration: intentional process by which the researcher brings qualitative and quantitative approaches together in a study
  - Integration approaches underutilized
- 



# What is a joint display?

Bring quan and qual together through a visual means

Draw out new insights-synergistic

Framework to integrate and represent MM analysis

Types and applications in health sciences is lacking

# Key Feature of Mixed Methods: Integration



**Intentionally collect  
*both* quantitative  
and qualitative data  
and combines the  
strengths of each to  
answer research  
questions**



**Integration  
generates  
something new**

Qualitative follow-up studies  
Instruments  
Meta-inferences



**Meta-inferences:  
result from  
integrating results  
or data**

# Integration at the Methods Level

**How one brings together the quantitative and qualitative results in a mixed methods study**

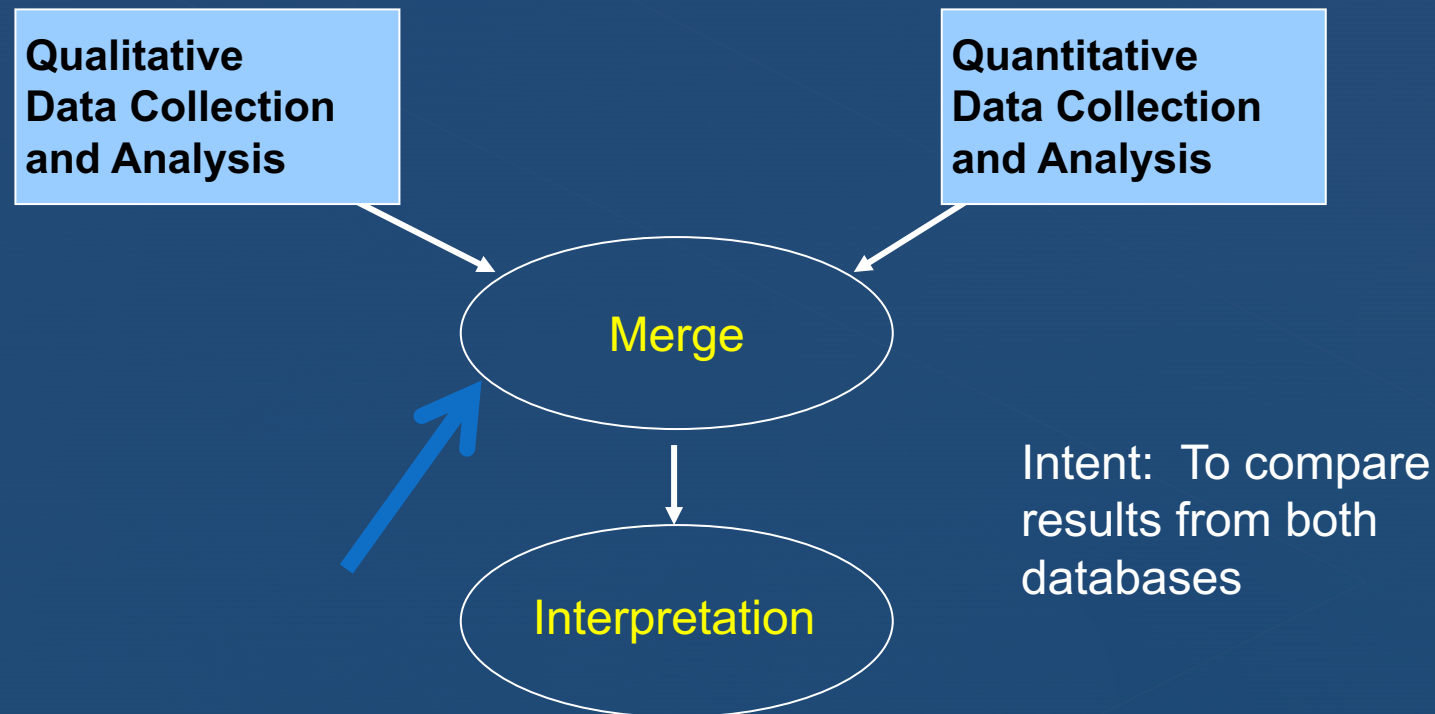
- **Merging**
- **Connecting (i.e., explaining)**
- **Building**

Source: Fetters, Curry, & Creswell (2013)



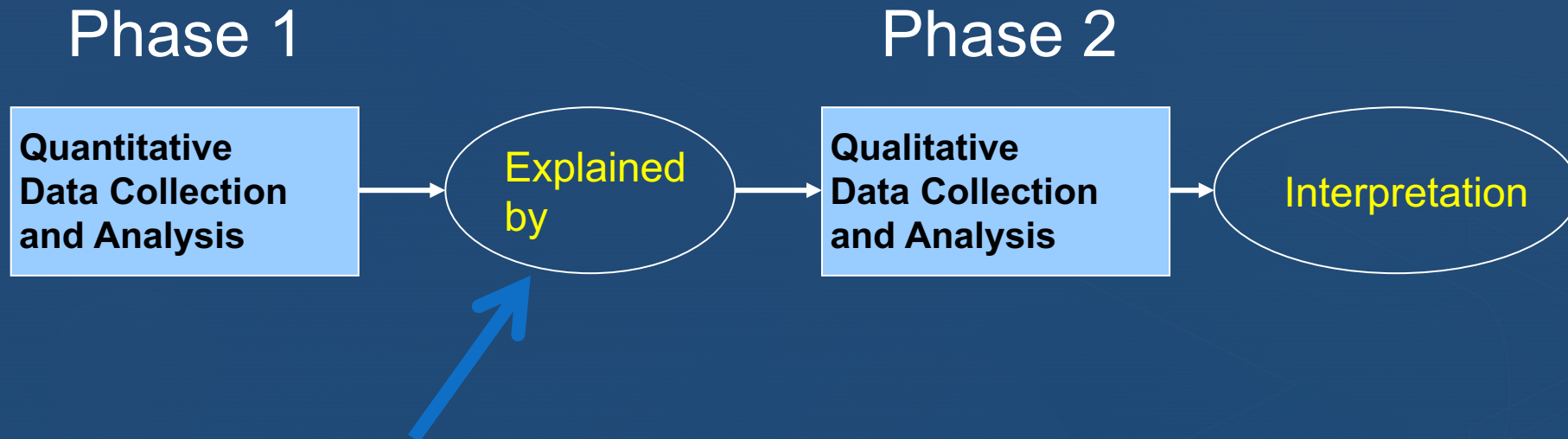
# Merging Integration

- Bring qualitative and quantitative data together for analysis and comparison
  - e.g., Bradt et al. (2015) compared quantitative pain scores of patients to their qualitatively derived experiences with music therapy and music medicine



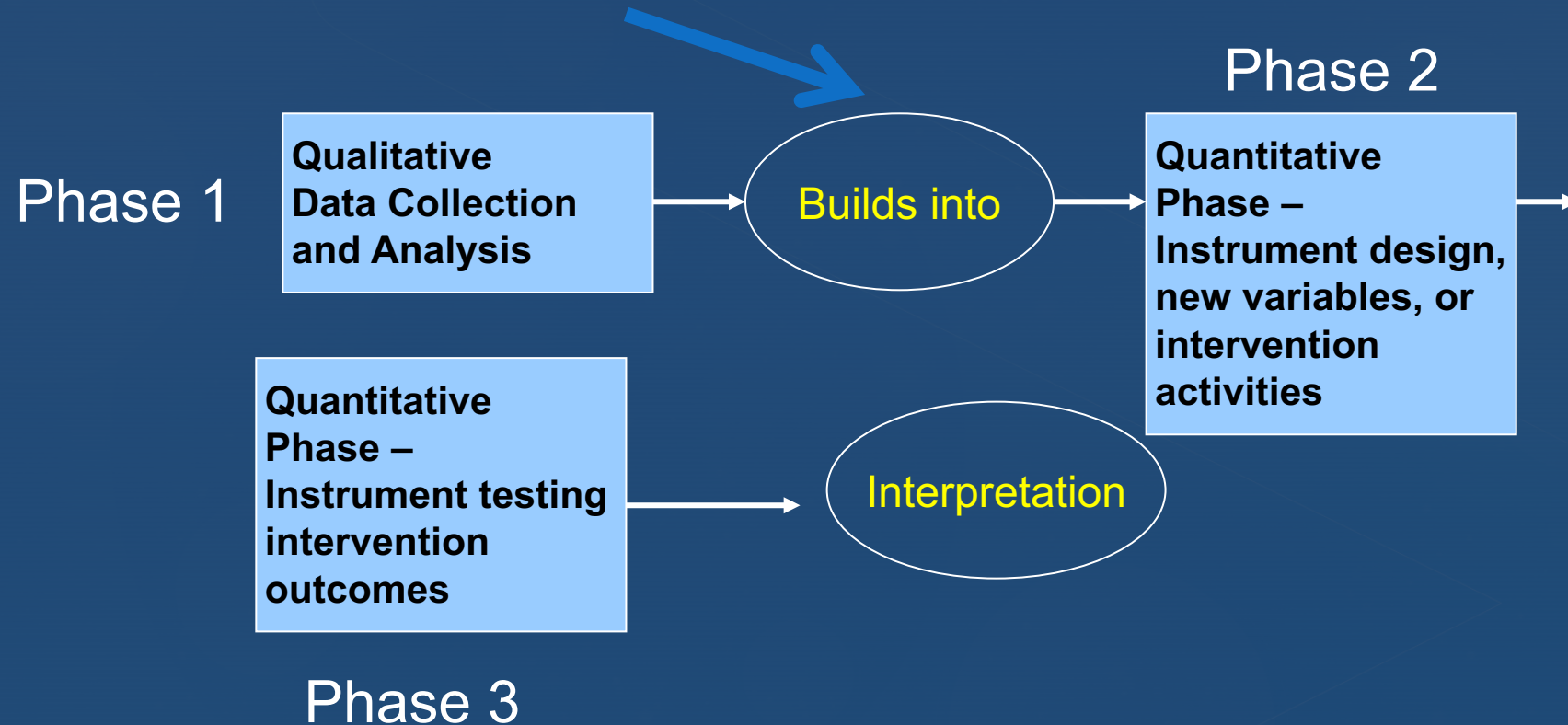
# Connecting Integration (Explaining)

- **Connecting:** links data through sampling
  - e.g., Finley (2013) quantitatively analyzed and then conducted qualitative interviews to validate the Work Relationship Scale (WRS) for primary care clinics



# Building Integration

- The results of one component informs the data collection of the other
  - e.g., Haggerty (2012) began qualitatively and then developed a measure of continuity of care



## What about integration in complex designs?



Merging, connecting, and building form the basis



You will likely use multiple types of integration

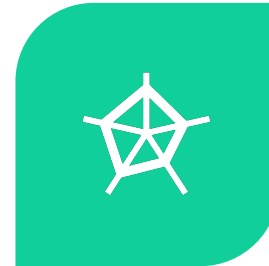
# Representing Integration through a Joint Display



BRING QUANTITATIVE AND  
QUALITATIVE APPROACHES  
TOGETHER THROUGH A  
VISUAL MEANS



DRAW OUT NEW INSIGHTS-  
SYNERGISTIC



FRAMEWORK TO INTEGRATE  
AND REPRESENT MM  
ANALYSIS



TYPES AND APPLICATIONS IN  
SOCIAL AND HEALTH  
SCIENCES ARE DEVELOPING



How Might You Present  
Integration in Your  
Projects Using Joint  
Displays?

## Types of Joint Displays by Design

Convergent Designs	Description	Stage/Type of Integration
Side-by-Side Display	Array quantitative and qualitative data together by questions, statistical results, or themes	Analysis/ Merging
Statistics-by-Themes Display	Array quantitative data by qualitative themes	Analysis/ Merging
Geocoding-by-Themes Display	Array geographic location data by qualitative themes	Analysis/ Merging

# Types of Joint Displays by Design

Explanatory Sequential Designs	Description	Stage/Type of Integration
Participant Selection Display	Link quantitative results to participants purposefully selected for the follow-up sample	Planning/ Connecting (Explaining)
Interview Questions Display	Link the initial quantitative findings to the follow-up qualitative results for the purpose of explanation	Planning/ Connecting (Explaining)
Exploratory Sequential Designs		
Instrument Development Display	Quotes, codes, or themes that match proposed items, variables, or scales for instrument development purposes	Planning/ Connecting (Building)





## Convergent Designs

# Representing Merging in a Joint Display



## Template for a Side-by-Side Joint Display

	<u>Qualitative</u> Interview Findings	<u>Quantitative</u> Results of Survey	<u>Mixed Methods</u> Interpretation
<b>Theme</b>			
<b>Theme 1</b>	Descriptive summary, codes, quotes, et.	Summary of results related to the theme	Summarize meta- inferences; convergence, divergence, expansion
<b>Theme 2</b>			
<b>Theme 3</b>			
<b>Theme 4</b>			

# Purpose of HIV Stigma Study

**Purpose:** Understand stigma in low HIV prevalence settings in West Bengal

**Data collection:** Quantitative stigma measures at community level and narrative stories of discrimination

**Integration:** Merging narrative findings with quantitative survey results in a joint display

# Side-by-Side Comparison of Results

Source: Panda et al, 2015

**Table 5.** Juxtaposed Findings From Qualitative and Quantitative Inquiry on HIV Stigma in West Bengal.

Domains	Qualitative investigation	Quantitative investigation
<i>Fear</i> (Correct knowledge on HIV transmission reduced occurrence of this domain)	<p><i>Myths about HIV transmission expressed</i></p> <p>People should not talk and socially mix with spouses of PLH [person living with HIV] to avoid acquiring HIV</p> <p>PLH should not be allowed to cook food for others (their personal belongings should also be kept separate)</p> <p><i>Acts reflecting fear/impinging on individual rights</i></p> <p>Vaccination denied to a child whose father died of AIDS</p> <p>Job as ICDS center cook denied to an eligible candidate living with HIV</p> <p>Stones were thrown at the spouse of a PLH and attempting to drive her away</p> <p>A PLH was not allowed to watch television show at the local youth club</p> <p>A PLH was not allowed to use a village-pond meant for common use</p> <p>Handle of a tube well previously used by a PLH (or his family members) was repeatedly washed before use</p>	<p>76% survey respondents in Paschim Medinipur and 59% in Howrah reportedly had fear of HIV transmission through noninvasive contact. Those not attending school had twice the odds of such fear compared to school attendees. Believers of mosquito-bite-based HIV transmission also had such fear.</p>
<i>Blame and Judgment</i> (Correct knowledge on HIV transmission did not reduce occurrence of this domain)	<p><i>Connotation changed as per route of infection</i></p> <p>Blood transfusion mediated HIV transmission (focus placed on system fault rather than individual punishment)</p> <p><i>Moral connotation</i></p> <p>Punishment for PLH was thought appropriate in relation to sexual route of transmission of HIV</p> <p>Women with HIV were described as destroyer of family but men with HIV were not described in such terms</p>	<p>96% survey respondents in Paschim Medinipur and 88% in Howrah had judgmental attitude. Significantly higher proportion of those having correct knowledge about mother to child transmission of HIV had judgmental attitude attached with HIV.</p>
<i>Shame</i> (Correct knowledge on HIV transmission did not reduce occurrence of this domain)	<p><i>Attitude linked with sexual act</i></p> <p>Sexually acquired HIV was associated with shame</p> <p>Although "God" was not referred to as someone giving punishment in the form of HIV/AIDS, HIV disease itself was considered as a punishment. Suffering and punishment were justified in the pretext of sexual indiscretion</p>	<p>76% survey respondents in Paschim Medinipur and 88% in Howrah had attached shame with HIV. Higher proportion of those with correct knowledge on the role of condom in preventing HIV transmission associated shame with HIV.</p>

## Merging Analysis Using Joint Displays

### Step 1: Analyze Separately

Conduct separate  
analysis of  
quantitative and  
qualitative data

Summarize  
results

### Step 2: Create Joint Display

Link quantitative  
themes to related  
quantitative  
constructs

Compare results

### Step 3: Interpret

Interpret and  
develop  
inferences

Write a  
discussion,  
typically in a  
results section

## Template for a Statistics-by-Themes Joint Display

	Variable-level 1	Variable-level 2	Variable-level 3
Theme 1	Illustrative quotes; statistical results		
Theme 2			
Theme 3			
Theme 4			

*Figure 6.* Example statistics-by-themes joint display

# Purpose of Depression- Concordance Study

Wittink et al. (2006)

**Purpose:** understand concordance and discordance between physicians and patients about depression status by assessing older patients views of interactions with their physicians

**Data sources:** semi-structured interviews with patients >65 who self-identified as depressed, quantitative demographics and instruments

**Integration approach:** merging themes with statistics (e.g., depression score), joint displays

- Convergent Design

Wittink et al,  
2006

**Table 3. Characteristics of Persons According to Themes Raised in Semistructured Interviews (n = 48)**

Characteristics	"My doctor just picked it up" n = 6	"I'm a good patient" n = 8	"They just check out your heart and things" n = 7	"They'll just send you to a psychiatrist" n = 6
<b>Sociodemographic characteristics</b>				
Age, mean $\gamma$ (SD)	73.3 (3.3)	77.5 (4.2)	75.1 (7.8)	71.3 (6.3)
Women, No. (%) <sup>*</sup>	6 (100)	6 (75)	4 (57)	4 (67)
African American, No. (%) <sup>*</sup>	2 (33)	3 (38)	2 (28)	3 (50)
Education less than high school, No. (%) <sup>*</sup>	2 (33)	3 (38)	2 (28)	2 (33)
<b>Psychological status</b>				
CES-D score, mean (SD)	19.0 (11.8)	11.9 (7.4)	15.3 (9.6)	14.0 (10.3)
BAI score, mean (SD)	10.5 (4.9)	10.0 (9.1)	6.4 (4.5)	6.8 (3.8)
BHS score, mean (SD)	4.8 (4.9)	3.8 (3.1)	4.6 (3.7)	5.7 (3.1)
<b>Cognitive status</b>				
MMSE score, mean (SD)	28.7 (1.2)	27.5 (2.2)	28.9 (0.7)	27.8 (1.7)
<b>Physical health</b>				
Physical function score, mean (SD)	64.2 (21.5)	63.6 (31.0)	71.3 (24.8)	56.7 (28.2)
Role physical score, mean (SD)	45.8 (36.8)	65.6 (35.2)	46.4 (44.3)	29.2 (29.2)
Role emotional score, mean (SD)	88.9 (27.2)	72.3 (39.8)	50.0 (50.0)	83.3 (40.8)
Social function score, mean (SD)	75.0 (17.7)	70.3 (34.0)	62.5 (27.0)	72.9 (21.5)
Bodily pain score, mean (SD)	61.3 (17.7)	55.0 (25.8)	50.4 (26.1)	43.8 (24.2)
General health perception score, mean (SD)	41.7 (15.7)	61.3 (17.5)	54.3 (16.4)	42.5 (14.4)
No. of medical conditions, mean (SD)	8.7 (0.8)	6.6 (2.9)	8.0 (3.1)	8.0 (2.3)
No. of visits within 6 months, mean (SD)	2.5 (1.0)	2.8 (1.4)	2.6 (1.5)	2.8 (1.5)
<b>Discussion of depression with physician</b>				
Doctor understood how you feel, No. (%) <sup>*</sup>	5 (83)	4 (50)	1 (14)	3 (50)
Has discussed feelings with doctor, No. (%) <sup>*</sup>	5 (83)	3 (38)	1 (14)	2 (33)
<b>Physician ratings at index visit</b>				
Physician rates the patient as depressed, No. (%) <sup>*</sup>	6 (100)	3 (38)	4 (57)	6 (100)
Physician knows the patient very well, No. (%) <sup>*</sup>	5 (83)	6 (75)	4 (57)	4 (67)

Note: Data From the Spectrum Study (2001-2004).

<sup>\*</sup> Column percents.

BAI = Beck Anxiety Inventory; CES-D = Center for Epidemiologic Studies Depression Scale; MMSE = Mini-Mental State Examination.



## Template for a Geocoding-by-Themes Joint Display

Quantitative Results with Color Coding or Numbers in Region  
Themes in Regions (i.e., geographical areas)  
Overlay Quotes

<b>Region 1</b> Themes Illustrative Quotes	<b>Region 2</b>	<b>Region 3</b>
<b>Region 4</b>	<b>Region 5</b>	<b>Region 6</b>
<b>Region 7</b>	<b>Region 8</b>	<b>Region 9</b>

# Purpose of Wyoming Substance Abuse Needs Assessment (PI: Minugh)



**Purpose:** conduct an assessment of current substance use and abuse across counties in WY

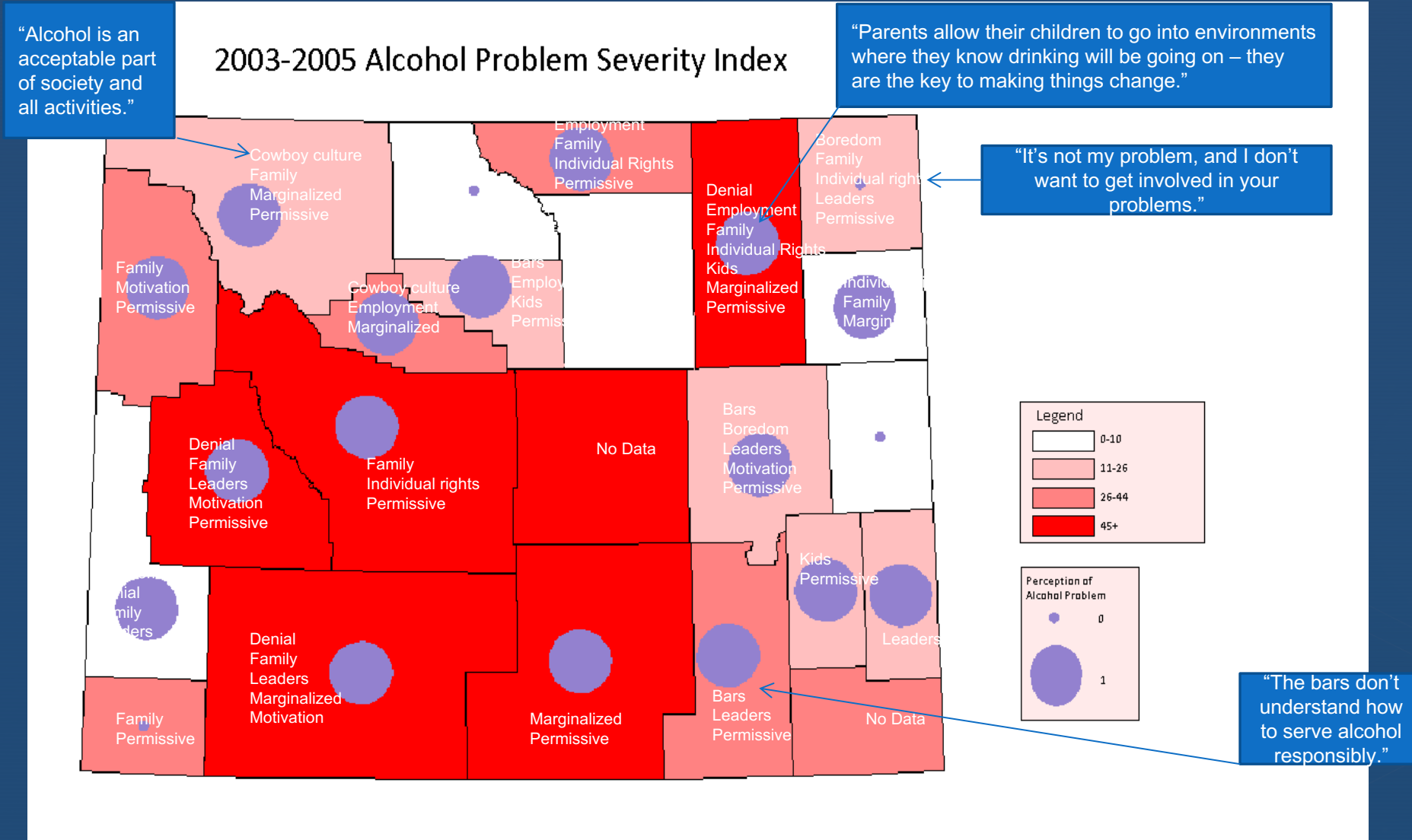


**Data sources:** qualitative interviews; quantitative Alcohol Problem Severity Index, perception of problem



**Integration:** merging qualitative comments and problem quantitative data by geographical area

# Geocoding-by-themes





## Explanatory Sequential Designs

# Representing Connecting in a Joint Display

## Template for a Participant Selection Joint Display

	<b>Quantitative Results</b> (organize by major result, levels of categorical variable, etc)			
Characteristics	Key Result 1	Key Result 2	Key Result 3	Key Result 4
Characteristic 1	Describe sample			
Characteristic 3				
Characteristic 3				

## Template for an Interview Questions Joint Display

<b>Quantitative Results (organize by scales, key results, constructs, etc)</b>	<b>Qualitative Interview Questions</b>
Scale 1	Related questions
Scale 2	Related questions
Scale 3	Related questions
Scale 4	Related questions

# Purpose of Doctoral Education Persistence Study

**Purpose:** understand students' persistence in an educational program

**Data sources:** web-based survey; qualitative case study with follow-up interviews and document analysis

**Integration:** Connecting in selecting participants for follow-up based on numeric scores on survey

# Participant Selection

**TABLE 3**  
**Participants Selected for Case Study Analysis Using the Maximal Variation Principle**

	<i>Group 1: Beginning (Gwen)</i>	<i>Group 2: Matriculated (Lorie)</i>	<i>Group 3: Graduated (Larry)</i>	<i>Group 4: Withdrawn/Inactive (Susan)</i>
Age (years)	36–54	36–45	46–54	>55
Gender	Female	Female	Male	Female
Residency	In state	Out of state	Out of state	Out of state
Family status	Single	Married with children older than 18	Married with children younger than 18	Single



## Template for an Explanation Joint Display

Quantitative Results	Qualitative Findings and Quotes	Mixed Methods Inference
<b>Domain 1</b>		
Low score on instrument	Qualitative themes with supporting quotes	How qualitative explained quantitative result
High score on instrument		
<b>Domain 2</b>		
<b>Domain 3</b>		

## Purpose of Validation Study

**Purpose:** Validate a measure of assessing relationships within primary care clinics

**Data sources:** quantitative WRS scale scores; qualitative interviews understanding variation in scores

**Integration:** explaining validation in scale scores for each domain with qualitative data

# Explaining Quantitative Results with Quotes

**Table 4. Quotes Related to Lanham et al's Relationship Characteristics in Clinics with High and Low WRS Scores**

## **Rich communication**

Communication through face-to-face conversation; most effective when messages are unclear or ambiguous

Low WRS score clinics

"I think that some days we should just sit down and say, 'Okay, this is what's going on. What do you know—how do you perceive this is supposed to be done?' ...[S]ometimes the hurdles that we run into are just, they could have been easily avoided if there had been a little bit better communication."

High WRS score clinics

"Well, you know we have what's called huddle every morning and any problems from the day before are discussed in huddle with all the team members and the clerical staff, social workers, the pharmacist. So we all get to know anything that's going on at that time."

## **Heedful Interrelating**

Individuals are attentive to their work tasks and sensitive to how their roles and actions affect and intersect with those around them

Low WRS score clinics

"...[T]here's a whole lot of tension and a lot of it has to do with, 'That ain't my job and you're messing in my area and you don't belong in my area and you need to back out and just stay in your own business.'"

High WRS score clinics

"I think the teamwork here is just excellent. You know we really nitch



## Exploratory Sequential Designs

# Representing Building in a Joint Display

# Template for an Instrument Development Joint Display

Qualitative Theme	<u>Qualitative Findings</u>	<u>Quantitative Instrument</u>	
	Codes	Instrument Scale	Instrument Items
Theme 1	Code 1	Scale 1	Item 1
	Code 2 [Other codes]		Item 2 [Other items]
Theme 2	[Other codes]	Scale 2	[Other items]
Theme 3	[Other codes]	Scale 3	[Other items]

## Purpose of Instrument Development Study

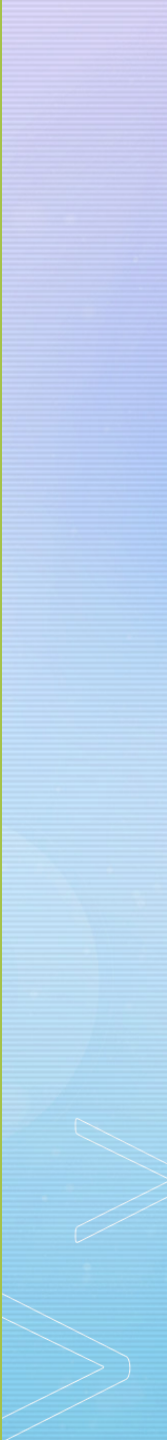
- **Purpose:** begin with a qualitative exploration to design, develop, and test a skills assessment instrument
- **Data sources:** qualitative interviews and document analysis; quantitative instrument development and testing
- **Integration:** building the instrument by taking codes to variables/items informed by quotes

# Instrument Development

Qualitative Findings Themes Codes	Quantitative Assessment Instrument Scales and Items Derived from Codes/Quotes
<b>Experiences</b>	<b>Professional Experiences</b>
Coursework	I have completed a qualitative research course. I have completed a quantitative research course. I have completed a mixed methods research course.
Read MM literature	I have read a mixed methods book. I read mixed methods literature at least weekly.
Conferences	I have attended a mixed methods conference.
Project work	I have worked on a mixed methods project.
Mentoring	I have a mixed methods mentor. I have served (currently or in the past) as a mixed methods mentor.
Providing consultation	I provide consultation for mixed methods studies.
Teamwork (skills)	I have worked on a mixed methods research team.
Teaching	I have taught a mixed methods course.
Disseminating (skills)	I have published a peer-reviewed paper focused on mixed methods.
Funded mixed methods study	I have had (currently or in the past) external funding for a mixed methods research study.
<b>Researcher Characteristics</b>	<b>Personal Characteristics</b>
Mixed methods was natural	Mixed methods research comes naturally to me.
Flexible thinking	When conducting research, I can imagine the different possible sources of data.
Reflective openness	I think creatively about research. I am comfortable with dissimilar views on research.
Discipline sees value of mixed methods	My discipline values mixed methods research.
Teamwork (skills)	I work well in teams. I collaborate well with others.



# Intervention Mixed Methods Designs





# Purpose of MPathic-VR Study



**Purpose:** RCT of a virtual human intervention vs. a computer based module in communication training



**Data Sources:** quantitative program scores, attitude scale, Objective Structured Clinical Exam; qualitative observations and student reflections



**Integration:** merging quan attitude scale with qual reflections



Side-by-side Joint Display of Attitudes  
with Qualitative Reflections on  
Experience

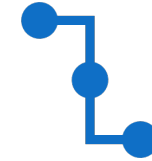


Domain	Intervention	Control	MM Inference		
Domain	Attitudinal Item Mean (SD)	MPathic-VR Qualitative Reflection Illustrative Quotes	CBL Attitudinal Item Mean (SD) Qualitative Reflection Illustrative Quotes	Interpretation of mixed methods findings	
Verbal Communication	4.11 (1.85)	“How to introduce myself without making assumptions about the cultural background of the patient and the family”	2.77 (1.45)	“This educational module was useful for clarifying the use of SBAR and addressing ways that all members of a health care team can improve patient care through better communication skills”	Intervention arm comments suggest deeper understanding of the content than teaching using memorization and mnemonics as in the control, a difference confirmed by higher attitudinal scores.
Nonverbal Communication	5.13 (1.48)	“Effective communication involves non-verbal facial expression like smiling and head nodding”	2.34 (1.35)	None	Intervention arm comments address the value of learning non-verbal communication, the difference confirmed by attitudinal scores.
Training was engaging	5.43 (1.55)	“Reviewing the video review was a great way to see my facial expressions and it allowed me to improve on these skills the second time around”	3.69 (1.62)	“This experience can be improved by incorporating more active participation. For example, there could have been a scenario in which we would have to select the appropriate hand-off information per SBAR guideline”	Intervention arm comments reflect engagement through the after action review while the control comments suggested the need for interaction, the difference confirmed by higher attitudinal scores.

# Constructing a Joint Display



Iterative Process



After linking data,  
think about integration  
type and design



Mock up a joint  
display at design  
phase

# Checklist for Creating Joint Displays

## Joint Display Feature

- Clear title to indicate what is presented
- Includes both qualitative and quantitative data
- Clearly identifies qualitative and quantitative data sources
- Demonstrates the integration of qualitative and quantitative data
- Consistent with the selected mixed methods design
- Consistent with the stage of integration (e.g., planning, analysis, conclusion)
- Consistent with the type of integration: merging, building, explaining
- A description in the text accompanies the display
- Parallel level of aggregation (e.g., themes to statistics)

# Readings on Joint Displays

- Bazeley, P. (2018). *Integrating analyses in mixed methods research*. London, UK: SAGE.
- Guetterman, T., Creswell, J. W., & Kuckartz, U. (2015). Using joint displays and MAXQDA software to represent the results of mixed methods research. In M. McCrudden, G. Schraw & C. Buckendahl (Eds.), *Use of visual displays in research and testing: Coding, interpreting, and reporting data* (pp. 145-176). Charlotte, NC: Information Age Publishing.
- Guetterman, T. C., Fetters, M. D., & Creswell, J. W. (2015). Integrating quantitative and qualitative results in health science mixed methods research through joint displays. *The Annals of Family Medicine*, 13(6), 554-561. doi: 10.1370/afm.1865
- Plano Clark, V. L., & Sanders, K. (2015). The use of visual displays in mixed methods research. In M. McCrudden, G. Schraw & C. Buckendahl (Eds.), *Use of visual displays in research and testing* (pp. 177-206). Charlotte, NC: Information Age Publishing.

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