



Learn to Use an Exploratory Sequential Mixed Method Design for Instrument Development

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Student Guide

Introduction

Mixed methods research involves not only including a qualitative and quantitative component in the same study but also mixing them—connecting or combining them—in a way that the two are in conversation with each other. Beginning a study with an exploratory, qualitative phase and moving sequentially to a quantitative phase is sometimes called “exploratory sequential mixed methods.” The first phase is qualitative and concludes with analysis producing codes or more conceptual themes. The results of this analysis is used to direct the next, quantitative phase, which could be a survey or some other form of quantitative data collection. Two primary variants of the exploratory design are the theory-development variant, where the larger objective of the mixed methods study is to develop theory, and the instrument-development variant, where the objective is to develop a refined instrument to test a hypothesis (Creswell & Plano Clark, 2018).

What Is Exploratory Sequential Mixed Methods?

Exploratory sequential mixed methods is an approach to combining qualitative and quantitative data collection and analysis in a sequence of phases (Creswell & Plano Clark, 2018). In the first phase, researchers collect qualitative data and then analyze the data, the results of which direct the next, quantitative phase, which could be a survey or some other form of quantitative data collection. That

is, the qualitative analysis provides critical fodder for developing specific research questions for the quantitative phase, which involve a questionnaire, survey, or other form of quantitative data collection.

The rationale for this approach lies in first exploring a topic before deciding what variables need to be measured. We can think of an exploratory sequential design as a template that is applied to a specific research situation, but each situation might use this design differently. The first question to ask is what we already know given the existing literature. In other words, the point of departure may vary for researchers adopting this design. For situations where a literature review reveals few findings to guide us, the qualitative phase might be rewarding in allowing us to discern a new dependent variable. That is, we might already have the necessary demographic variables and pre-existing measures for the independent variables, but we might be missing the dependent variable. In general, the qualitative analysis will help us identify a larger range of topics and how individuals frame their understanding around a particular event or phenomenon. The qualitative phase is described as “exploratory” because it is data driven (Creswell & Plano Clark, 2018) rather than driven by a conceptual framework. However, this does not mean that we are not allowed to use information from a literature review, only that we are using the qualitative data to better understand the research problem. The reason to postpone quantitative data collection is because we need additional conceptual leverage before conducting a survey or questionnaire.

Qualitative data analysis involves identifying meaningful quotations, coding them with relevant topics, and possibly developing larger themes. A quotation might be a phrase, sentence, paragraph, or larger text segment. A code is a topic from the literature or constructed inductively from a close reading of data. A theme is a conceptual topic that is more abstract than a typical code. In a study of hurricane survival, we might construct a theme, the *communal self*, which captures how participants increasingly use the word “we” to replace the “I” in their narratives as

they develop a growing bond with their community.

In moving from qualitative analysis to developing a questionnaire, the codes become variables, themes become scales, and the quotations become survey items. The quantitative data collection can incorporate both open-ended answers as well as scale-based questions. This again depends on what we already know from a literature review and from the qualitative phase. The language from the qualitative data can be used in forming questions. If religious participants have their own term for “being fortunate,” then we might use their language in the related survey items for religious respondents. In the qualitative analysis, we might have identified an unanticipated code, such as the code for “cancer graduate,” in a study of cancer survivors. This code refers to cancer treatment as a kind of education where patients have learned many medical terms and feel they can have an informed conversation with their oncologists. This code can become a variable to be further assessed in a survey by including an item on knowledge acquisition and perception of technical understanding. This is perhaps not an item that we might normally think of including in a survey, but the qualitative data have provided a larger range of data-driven codes, and hence, variables to be further measured. Similarly, themes such as *communal self* capture collective memories and sharing in others’ successes and losses. To assess the theme more quantitatively, we would develop a scale to address to what degree the respondent felt like an “I” or a “we.” This is not a single *yes* or *no* question but several questions assessing the degree to which people felt isolated or part of a collective. Scales are defined as follows: “Measurement instruments that are collections of items combined into a composite score, and intended to reveal levels of theoretical variables not readily observable by direct means, are often referred to as *scales*” (DeVellis, 2017). Hence, a Likert item in a survey might be used as one type of question to measure this variable. A Likert scale presents the item in a statement, following by options indicating varying degrees of agreement. For example, “I felt isolated during the hurricane, as if what was happening was

happening to me alone.” This would be followed by a scale from *strongly agree* to *strongly disagree* (DeVellis, 2017). Similar items would be developed to further assess this theme. The quantitative data would then be analyzed statistically to assess significance and generalizability.

In mixed methods research, we refer to the connective point between the qualitative and quantitative components as the “point of interface” (Creswell & Plano Clark, 2018). In exploratory sequential mixed methods, this happens between the qualitative and quantitative phases. But we should also note that the study could prioritize either the qualitative or quantitative component. For example, we might devote numerous resources to qualitative data collection and conduct a grounded theory study, an ambitious qualitative tradition aimed at not only generating themes but building a theory. This could be followed by a survey aimed at further testing the theory, but the thrust of the study could be considered qualitative. This theme-development or theory-development variant of the exploratory sequential design would be labeled QUAL→quant (Creswell & Plano Clark, 2018). In contrast to this, we might instead do one or two focus groups, summarize the results, then move into an extensive quantitative phase with a large-scale survey and complex statistical analyses. This instrument development variant (Creswell & Plano Clark, 2018) would be notated as qual→QUAN, indicating that the primary focus of the study is the quantitative analysis.

Illustrative Example: Written Narratives From the Survivors of Hurricane Floyd

This dataset example uses 42 descriptive accounts or journals written or typed by undergraduate students attending East Carolina University (Greenville, North Carolina) in 1999 as part of a history assignment. In Phase 1 of our mixed methods study, we are interested in what the journals reveal about living through

a hurricane. Several coded documents are included with this dataset.

Research question: How do young adults experience living through a hurricane?

The Data

The data were collected at East Carolina University (Greenville, North Carolina, USA) in a history class of undergraduate students who were asked to write about their experience of Hurricane Floyd in 1999. (Note that names used in this article are pseudonyms.) In this approach, the researcher has less opportunity to impose an agenda on the data collection. Each participant focused on what mattered most to them; they told their account on their own terms with no probing from the researchers. Some students chose to address a particular person as their reader and used an epistolary mode in narration. Other students included dates to indicate how circumstances changed from day to day, as in a typical diary. All narratives were entered into a text analysis software for coding and analysis. This software allows researchers to generate reports of quotations coded to a code in order to assess patterns across documents. Software can also generate reports of demographic variables and codes, allowing researchers to see differences across demographic groups, if that is part of the research agenda.

Analyzing the Qualitative Data

In the qualitative phase, we began analyzing the data by first coding textual segments with two types of codes. Codes were either deductive topics that we initially considered as provisional codes relevant for the study or inductive topics that we discerned during data review. In short, we conducted a generic qualitative study rather than employing a specific qualitative tradition such as grounded theory or case study. In our generic study, we applied codes to text and then considered more abstract themes—code combinations that suggested more

evocative concepts.

Our research question is about experience: How do people experience living through a hurricane? We are also interested in topics related to experience, such as people and settings. Hence, when we began this study, we had a small set of *a priori* (or deductive) codes. These were based on assumptions regarding what young adults would write about in their hurricane accounts. The deductive codes were *emotions, family, friends, neighbors, decision-making, media, flood conditions, and property loss*. Defining deductive codes is critical because it documents our point of departure and which codes were part of our understanding before data review. Note that the deductive code *flood conditions* was renamed *assessing environment* in order to better capture the participant experience, not just an environmental condition. In addition to deductive codes, we discerned inductive codes that took us in valuable but different directions from our pre-determined topics.

Deciding to what degree we will use deductive and inductive codes is beyond the scope of this dataset, but we will note that in studies driven by a theoretical or conceptual framework, we might exclusively use deductive codes. In studies that are more exploratory or data driven, we would instead incorporate a large number of inductive codes or perhaps only inductive codes. Because we are embarking on an exploratory sequential mixed methods study, we are privileging the inductive codes. We are interested in a data-driven approach in order for the quantitative phase to be closely aligned with participant perspectives rather than with a predetermined list of codes.

Hence, we were attentive to inductive codes, which include *actions, timescale, authority, socializing, and absolutist language*. Our approach, both deductive and inductive, was pragmatic. In other words, we were interested in coding for the *who, what, where, and when* of the data. Our codes address each of

these fundamental domains. The *who* was addressed by the people codes. The *where* was addressed by the *environment* codes. The *when* was address by the *time* code. The *what* was addressed by the *person*, *communication*, and *emotions* codes. These codes serve as organizing codes under which more specific subcodes are placed.

Descriptive and Interpretive Codes

Notice that some codes are strictly descriptive, such as *friends*. Descriptive codes are topics that are lower on the conceptual ladder than interpretive codes. Interpretive codes, such as *lack of control*, are more abstract and might require returning to data more than once to consider subtext. Let us consider the quotation below, Dina describes her place of employment, a restaurant that was destroyed, and how the world of the restaurant is now gone forever.

The Darryl's that I work at has to be closed down due to the flood. I walked through the restaurant after the waters had receded and could not believe what Floyd had done. I immediately started to cry. Table and chairs were moved around or tossed over, everything had a nasty film on it, and the kitchen was destroyed. It was also sad to think that I would never be returning to see all the familiar faces and friends that I had made. (Dina)

Her account of this loss suggests a lack of control or agency. There is a finality in how she expresses the enormity of the loss; she does not seem to have any control over the restaurant's fate. Though she does not explicitly say that she feels out of control, we can argue that the quotation implicitly suggests the absence of personal power.

In studies that attempt to build theory, there could be numerous interpretive codes. In studies that are more descriptive, we might focus instead on surface-level

codes. In our generic study, we focused largely on descriptive codes but also considered interpretive codes, such as *trying to live normally*.

Coding Example: Sonya's Document

In the below excerpt, we have assigned codes in the margin. Notice that several codes can be applied to the same text segment.

<p>My experience with Hurricane Floyd does not contain words such as “disaster” or “tragedy.” It was an educational adventure for me and a time to bond with my new mother-in-law.</p>	<p>attitude family</p>
<p>Having just moved to coastal North Carolina from land-locked Memphis, TN, dealing with a hurricane was all new. I got caught up in the hype Wednesday, September 15. My new husband was two hours away at the time, at our home-in-progress on Harker’s Island. As the skies remained thick and gray, and the news showed the largest swirl of storm which I have ever seen, I grew increasingly anxious that he should be home with me. Finally, at about 1 p.m., he called to let me know that he was headed my way and was bringing his mother, Juley, to our apartment, which is maybe 300 square feet.</p>	<p>family timescale assessing environment anxiety home</p>
<p>I went to the grocery store and to the liquor store, where things were moving at an unusually fast pace. I sat and watched the news. Greg and his mother arrived safely and we passed the rest of the night watching the weather and discussing past hurricanes they had weathered while living in North Carolina for the last ten years. They had lived at Buxton, NC for a number of years and now live on Harker’s Island. I was convinced that they were idiots for remaining so close to the ocean during hurricanes.</p>	<p>media partner time socializing beliefs</p>
<p>My opinion on that changed after Floyd. Six months ago, I had no idea that hurricanes struck with such regularity. Wow! To evacuate with every hurricane would be ridiculous. I realized how much we rely on the media for our information. Depending on what they predicted, I would choose to evacuate or not. These are matters of life and death. Previously, I also thought it was somewhat foolish to live in area with so many destructive hurricanes. Now I realize, though, that they are somewhat predictable. I also think that they bring a sense of reality to our racetrack that is inspiring and invigorating. They are a reminder of how big the world is and how small people are.</p>	<p>time beliefs media decision making</p>
<p>They are an exciting, awe-inspiring force of nature.</p>	<p>attitude</p>

Here is the structure of the combined deductive and inductive codes. As mentioned earlier, we used primary codes, such as *person*, *actions*, *emotions*, and

communication, to organize more specific subcodes. Notice also that the subcode *negative emotions* has subcodes of its own: *anxiety*, *guilt*, *sadness*, *skepticism*, and *surprise*.

Person

- absolutist language
- beliefs
- religion

Actions

- assessing environment
- decision making
- experiencing loss
- helping others
- socializing
- trying to live a normal life

Psycho-emotional

- attitude
- lack of control/agency
- luck
- positive emotions
 - compassion
 - gratitude
- negative emotions
 - anxiety
 - guilt
 - sadness

- skepticism
- surprise

Communication

- media
- messaging

Environment

- community
- home
- organizations
- property
- timescale

Stage of Hurricane

- preparation
- response
- recovery

Relationships

- family
- friends
- partner

Brief definitions of codes are listed below:

Person

Absolutist Language

The code *absolutist language* refers to strong language such as “always,” “never,” “definitely,” “completely,” “totally,” “unbelievable,” and “extremely.” These words point to identity statements, strong conclusions about the environment or community, and the magnitude of the meaning of events.

Beliefs

The code *beliefs* refers to assumptions or thoughts that a participant holds onto as being true. It is a state of mind in which someone believes something to be the case.

Religion

Religion refers not only to places of worship, such as churches and synagogues, but to references to praying, faith, being blessed, believing in a higher power as well as references to God, Satan, Jesus, or other religious personae.

Actions

Assessing Environment

The code *assessing environment* refers to descriptions of hurricane damage and the writers’ assessment of their physical environment. This includes descriptions of the destructive effect the hurricane had on the environmental setting, infrastructure, and persons.

Decision-making

The code *decision-making* refers to language suggesting that someone has made or is making a choice regarding how to manage the hurricane, their emotions, or others’ safety.

Experiencing Loss

Experiencing loss is applied to any text segment with the word “loss” or “lost” as well as similar terms. The loss can be specific (e.g., food) as well as general. Loss can also refer to loss of neighbors, community, and stability as well as property loss.

Helping Others

Helping others refers to talking about help; providing or receiving help because of hardship from the flood. This code has been applied even if it is not the participant who is offering the help.

Socializing

This code is applied to discussion of hurricane parties, talking to family or friends, and spending time with neighbors in general conversation rather than for purposes of rescuing or receiving aid.

Trying to Live a Normal Life

Continuing to live normally or not realizing the situation and finally facing reality; trying to ignore the situation but failing to do so.

Psych-emotional

Attitudes

This code is applied to any quotations where the hurricane, flood, and aftermath are assessed or evaluated.

Positive Emotions

Compassion: Refers to compassion, empathy, sympathy evident in the narrator or others.

Gratitude: This topic refers to any references to being grateful in relation to kindness, assistance, outcomes, gifts, favors, or other types of generosity. Both implicit and explicit mentions are coded.

Lack of control/agency: Refers to not being able to control the forces of nature; reacting to the hurricane but feeling that one's actions are inadequate; being at the mercy of the hurricane.

Luck: The code luck is applied to text segments referencing being lucky, fortunate, or unfortunate. Mentions of feeling "blessed" are also included.

Negative Emotions

This code refers to negative feelings such as guilt, fear, and overwhelm.

Anxiety: This code captures references to being anxious, nervous, and uneasy.

Guilt: This code refers to a participant mentioning feelings of guilt in the context of others having lost or endured more than they have.

Sadness: The code is applied to references to feeling down, depressed, sad, or dejected. The person feeling sad might be the writer or others.

Skepticism: This code refers to sarcastic and cynical comments regarding the hurricane and media as well as skepticism regarding the severity of the storm.

Surprise: This code is applied to data where participants expressed how they were caught off guard or surprised by the unexpected.

Communication

Media

This code refers to specific references to any news media—radio, television, newspaper, and online sources.

Messaging

The code *messaging* applies to language suggesting information about the hurricane that is accepted without question. This is different from the code *media*, which we applied to specific mentions to news reports, online resources, television, radio, and newspapers. In applying the code for *messaging*, the informational source in the data might be vague or unnamed. In other cases, it is a specific person, such as a parent.

Environment

Community

Refers to the larger community, including persons who have no social relationship with the narrator, that is, the community as an aggregated entity.

Home

The code was applied to any mention of home of origin or current place of resident, such as an apartment or dorm room.

Organizations

This code was applied to quotations referencing local, state, or federal organizations helping with disaster relief, as well as to organizations taking on this role, such as churches or schools.

Property/Valuable Objects

Property/objects refers to houses, cars, furniture, as well as smaller objects that

have taken on sudden value, such as food. It can also refer to general references to possessions, such as “I can’t believe how many homes were damaged.”

Timescale

This code is applied to any general references to time, such as discussion regarding past hurricanes or what to expect in the future. It is applied to words suggesting time, such as “now,” “today,” “yesterday,” and “tomorrow.” It also refers to how people measure time differently depending on what is happening to them. Those trapped in a safe place experience a timescale differently from those who were rushing to save their possessions.

Relationships

Family

Family members of the narrator.

Friends

Friends, named or unnamed, of the individual.

Partner

Romantic partner of the narrator.

Example of Analytical Report: Experiencing Loss

The following report is an example of an analytical code report on a specific code, *experiencing loss*. A similar analysis would be done on each code.

Experiencing loss was applied to any text segment with the word “loss” or “lost” as well as similar terms. The loss can be tangible (e.g., food) as well as more abstract. The code report on *experiencing loss*—a report of all quotations coded

with this code—provides information on a range of participant experiences, from losing a jewelry box to an entire town being lost. At its worst, loss is expressed as “lost lives” or “lives destroyed.” Also common is the expression “lost everything,” which refers to losing a home and all its contents. “He lost everything except for a flashlight and a couple of pictures” (Carlos). The details of the few surviving objects indicate how possessions become especially valuable in light of extreme loss. Some of the excerpts suggest that loss differs based on whether it was anticipated, happening in the moment, or reflected upon after the fact. Here is an example of anticipated loss:

We started loading as much stuff as we could because she knew that she was going to probably lose the first floor. We stored stuff on the second level thinking that the water wouldn't get that high. Little did we know it would. (Diana)

Some people try to avoid loss by protecting their property, such as putting possessions on the roof or such as moving their car. “I didn't want to lose my car but there was nowhere else to put it” (Diana). Some loss was imagined: “I felt pretty bad for the people who probably lost their home” (Lanis).

After the hurricane, participants take inventory of what was lost and not lost. It is as if naming what they still own reinforces their hold on these possessions. Participants tend to take account of their loss and the loss of others: “homes, belongings, vehicles, and even lives” (Michael).

We only lost a tree and it damaged the backyard fence. (Lanis)

We lost all our food. (Shawn)

My dear best friend lost her home during the flood. Pictures, clothes furniture and memories were all inside her home. (Laura)

Assessing loss is a comparative act. People cannot help but address the comparative loss of others when they write about their own.

They have lost so much, while I lost almost nothing. (Becky)

My experience through the flood does not compare to my friends, family and other members of the society that lost their homes, farms and loved ones. (Laura)

Well what can you do what can you say when ones you know have lost everything and you have lost nothing. (Craig)

What I went through was nowhere near the loss that many other people had to endure. I had a home, furniture, and a car. Many people, just like me, were left with absolutely nothing. (Mina)

Those who did not lose anything physical nonetheless mention the psychological impact and their efforts to “[try] to empathize with loss of others.”

Broke my heart to see others lose everything. (Francis)

I did not personally lose nay possessions throughout this flood but it affected me a great deal. (Gina)

When I see the news stories of families that have lost everything, I wonder how they will ever recover because the majority of them were barely scraping by before the flooding. (Gina)

The psychological impact can involve the overwhelming notion of losing everything.

I cannot imagine losing everything and then having to move and start over. (Dina)

Even if individuals did not experience physical loss, they nonetheless lost structure and security.

The one thing I did lose was the small amount of structure that I had in my life. (Gina).

The experience of loss is related to relief. Sheila was momentarily relieved that she did not experience loss but “little did I know it was only beginning.” Because the hurricane and uncontrollable flooding worked in unexpected phases, individuals could not always be sure that they had not suffered losses.

As soon as the weather subsided outside, mom looked at the house to make sure no damage had occurred. When she told me none had, I thought the worse was over, little did I know it was only beginning. (Sheila)

Reports on each code such as this one allow us to see the range of what matters to participants and suggest directions for how this code can be measured as a variable in the next, quantitative phase as well as specific language we might use in the question items.

The Quantitative Phase: Constructing a Questionnaire

After having analyzed the qualitative data and completed what we would call a generic qualitative study, we decided to develop a questionnaire in order to assess whether any of the qualitative findings were statistically generalizable. This is the *point of interface* in this mixed methods study; we transition from a qualitative mode of inquiry to one that is quantitative and focused on measuring variables.

Research question: In what ways do the quantitative results generalize the qualitative findings?

Answering this question is beyond the scope of this dataset. Instead, we focus on specific examples of how we would move forward with questionnaire development, that is, how we use the codes as variables to be measured with specific question items. This section provides examples of how we constructed questionnaire items to further assess codes. For example, we considered using ordinal scales to address certain variables. Ordinal scales assign numbers to objects to reflect a rank ordering on an attribute. Though order matters in these questions, the difference between responses is not consistent across the scale. Another survey question option is the interval scale question, such as a scale going from *extremely likely* to *extremely unlikely*.

Other types of scales used include a Guttman Scale, which is used for constructs that are hierarchical and highly structured such as social distance, organizational hierarchies, and evolutionary stages. A respondent “should endorse a block of adjacent items until, at a critical point, the amount of the attribute that the items tap exceeds that possessed by the subject” (DeVellis, 2017). A well-known example of a Guttman Scale is the Bogardus Social Distance Scale:

1. Are you willing to permit immigrants to live in your country? (Least difficult)
2. Are you willing to permit immigrants to live in your community?
3. Are you willing to permit immigrants to live in your neighborhood?
4. Are you willing to permit immigrants to live next door to you?
5. Would you permit your child to marry an immigrant? (Most difficult)

Below are examples of how codes from our study were used to develop particular questionnaire items. In order to avoid repetitive examples, not all codes from the qualitative study are included below. Instead, for illustrative purposes, we selected representative subcodes from each primary code.

Helping Others

Helping others captures incidents where participants provided or received help during the hurricane or flooding. This topic provided valuable insight into prosocial behavior and when helping others was and was not evident.

Those people needed my help, not my tears and sympathy. (Sheila)

I felt so bad for her but I was glad that I had a place for her to stay. She brought her stuff inside and I didn't know how long she would be with us. (Diana)

However, in many transcripts, helping was not explicitly mentioned. The closed-ended questions below are a way for us to better assess how participants experienced help or provided their own.

During the flooding, I went out of my way to help others.

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

During the flooding, others went out of their way to help me.

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Experiencing Loss

As mentioned earlier, *experiencing loss* was applied to any text segment with the word “loss” or “lost” as well as similar terms. The loss can be specific (e.g., food) as well as less tangible. That is, *experiencing loss* can also refer to loss of neighbors, community, and stability as well as property loss.

We started loading as much stuff as we could because she knew that she was going to probably lose the first floor. We stored stuff on the second level thinking that the water wouldn't get that high. Little did we know it would. (Diana)

Luckily, the only this we lost was a lot of food due to the power outage. I will take a loss of food any day. (Nina)

The one thing I did lose was the small amount of structure that I had in my life. Since I moved to Greenville in 1997, I have tried to gain some sort of stability. (Gina)

My mom's friend said it's not the house, they can rebuild, it's the memories like pictures and letters that were lost. That hurts the most. (Tab)

The corresponding closed-ended questions are as follows. Because loss was discussed differently depending on whether it was anticipatory or reflective, we included two questions.

I took precautions to avoid losing possessions during the hurricane.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

I lost a number of valuable possessions due to flooding after the hurricane.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

A Guttman Scale also provides a way of addressing degrees of loss experienced.

<p>I lost temporary things during the hurricane, like electrical power.</p>	<p>Agree _____ Disagree _____</p>
<p>I lost a number of valuable possessions due to the hurricane and flooding.</p>	<p>Agree _____ Disagree _____</p>
<p>I lost temporary social structure due to the hurricane and flooding, such as classes being canceled.</p>	<p>Agree _____ Disagree _____</p>
<p>I lost both temporary things and permanent social structure due to the hurricane and flooding.</p>	<p>Agree _____ Disagree _____</p>

Participants who mention loss oftentimes compare their loss with that of others.

Well what can you do what can you say when ones you know have lost everything and you have lost nothing. What do you do to make them fill (sic) better, I guess you can only pray for them and tell them that God is in control. (Craig)

My experience with the Flood of 1999 was a very personal one. I was very lucky in the fact that my house did not receive any damage; my mother and I lost no shingles or even had any trees to fall. We consider ourselves extremely fortunate. But, no more than four or five blocks from my house in Farmville, whole neighborhoods were completely flooded out. (Sheila)

I have a few friends that lost their homes and I cannot begin to imagine what is going through their heads. It is scary that one event that no one can control can devastate so many people. When I see the news stories of families that have lost everything, I wonder how they will ever recover because the majority of them were barely scraping by before the flooding. (Gina)

Because individuals compare their loss with others, we constructed a question in order to assess what conclusions people draw when they

make these social comparisons.

Most people lost more than I did in the hurricane.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Trying to Live a Normal Life

We consider *trying to live a normal life* a theme because of its conceptual heft and because it was not only a code that we applied to some textual segments; it was also a concept suggested by co-occurrences of other codes, such as *socializing* and *preparation*. These conceptual co-occurrences suggest how some individuals prolong “normal” activities for as long as they can. As a theme, it helps tie various accounts, transcripts, and codes together. In this phase, our objective is to develop several items to form a scale to help measure this theme. Here is an example of a question we include in the scale. The format of this question allows respondents to compare activities and select their preference. This allows us to assess to what degree they tried to live a “normal life” during the hurricane and to what extent they dramatically changed their behavior.

Indicate your relative preference for activity A or activity B from the alternatives listed below by circling the appropriate phrase following the description of activity B.

Preferred activities immediately following the hurricane.

Activity A: Cooking a meal with a friend at their house, which has no flooding.

1. Activity B: Listening to news reports all day while staying at a friend’s house.

Strongly prefer A	Mildly prefer A	No preference	Mildly prefer B	Strongly prefer B
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2. Activity B: Assisting at a shelter.

Strongly prefer A	Mildly prefer A	No preference	Mildly prefer B	Strongly prefer B
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3. Activity B: Taking a ride in a boat to retrieve my possessions.

Strongly prefer A	Mildly prefer A	No preference	Mildly prefer B	Strongly prefer B
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4. Activity B: Wading through knee-deep water to retrieve my possessions.

Strongly prefer A	Mildly prefer A	No preference	Mildly prefer B	Strongly prefer B
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Attitude

The code *attitude*, a subcode of *psycho-emotional*, provides insight into people’s primary assessments and takeaways regarding the hurricane. Notice the different tone in the examples below.

The storm is over, and it wasn’t as bad as they said. I would hardly call it the “Storm of the Century.” (Lana)

We will get through this but we will never forget the haunting images and devastation that affected everyone financially, physically and emotionally. (Susanna)

Before coding the hurricane narratives, we did not consider that some people would think the storm was “not so bad.” To better measure how survivors consider the magnitude of the hurricane, we constructed the following Likert scales.

My life is forever changed because of the hurricane.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

The hurricane was not as bad as I expected.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Lack of Agency

Lack of control (or lack of agency) is a code that we would like to further examine with a closed-ended question. Because we noticed issues of control mentioned along the chronological timeframe of the hurricane, we constructed the following question. The following quotations suggests how lack of control shows up throughout the hurricane from preparation to response to recovery.

Preparation Phase

Great, it's pouring down rain and I have nothing to do ... except study.
(Lana)

We realized after a few minutes that the storm was much worse than what we had anticipated. (Garth)

Response

It seems like all I did was watch the footage on the news of the hardships my neighbors in Eastern NC were going through. The happenings were unbelievable. The Flood water was (and still is) devastating. People lost homes, and even towns it seems. Thousands of ECU students lost homes and one lost his life. (Michael)

Recovery

I cannot even identify how this has affected me emotionally and mentally. The stress of not knowing what was going on with school or work was very hard on me. Now, I am reluctant to drive or go out in the rain. (Gina)

Well what can you do what can you say when ones you know have lost everything and you have lost nothing. What do you do to make them fill (sic) better, I guess you can only pray for them and tell them that God is in control. (Craig)

Building from the code for *lack of agency*, we constructed the following questions with three response categories, each one indicating a different phase of the hurricane.

In which stage of the disaster cycle did you feel most in control?

- Preparation
- Response
- Recovery

Guilt

Guilt was not a common code in the data, but when it showed up, it was a meaningful part of the narratives.

I was so incredibly thankful that my family had fared so well, but I was also filled with a feeling of guilt that so many others had not been as lucky as I. (Mitchell)

We decided to further measure the variable for *guilt* by constructing a Likert scale which presents the item in a declarative sentence, followed by options indicating varying degrees of agreement.

I feel a sense of guilt when I think about how much some people lost compared to me.

1	2	3	4	5	6
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Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree
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Luck

Though luck is not an emotion per se, we include it as a subcode of *psycho-emotional* because it is relevant to one's psychological reaction to the hurricane. Half of the participants mention *luck* in their transcripts. Hence, we are interested in whether survivors in general consider luck to be important. Below are examples of coded content:

We consider ourselves **extremely fortunate**. (Sheila, emphasis added)

I went home to be with my family thinking I would be farther from the coast and in a safer place. Little did I know I was in the center of disaster. The flood waters came so fast and destroyed so much. I was **fortunate** that we did not suffer damage but we were trapped in our neighborhood for a few days without lights or water. This in itself creates a very stressful situation. It broke my heart to see friends and others lose everything. It was very disheartening and saddened me very much. I just can't comprehend the reason why such an event needed to take place. (Francis, emphasis added)

After seeing the losses of others in property and lives, I consider myself **very lucky** because my family and friends stayed safe throughout this whole terrible natural disaster. (Hans, emphasis added)

To further assess luck's role in participants' experiences, we constructed the following questions.

How much did luck play a role in your surviving the hurricane?

- Big role

- Medium role
- Small role
- No role

A Guttman Scale is also used to assess the nuanced accounts of luck and how participants seem to compare their circumstances to that of other survivors.

If school was canceled for the rest of the semester, I would still feel lucky.	Agree____ Disagree____
If I lost many of my possessions because of the flooding, I would still feel lucky.	Agree____ Disagree____
If I lost more possessions than my neighbors, I would still feel lucky.	Agree____ Disagree____
If I lost my house due to the hurricane, I would still feel lucky.	Agree____ Disagree____

When I think about the hurricane and its aftermath, I often feel lucky.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Sadness

We notice that most people mentioning sadness did so as they were reflecting on events, not during the immediate response to the flooding.

It is an extremely sad situation. Homeless people who have nowhere to go ... and the rivers aren't supposed to crest until Monday or Tuesday.
(Lana)

We construct a survey question to better assess the degree of sadness after the flooding had ended.

When I think about the hurricane and its aftermath, I am sad often.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Surprise

We examine the code for *surprise*, a subcode of negative emotions, by including the following question.

The extent of the damage due to Hurricane Floyd was surprising.

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Messaging

The code *messaging* refers to forms of communication suggesting varying degrees of authority; these include messages received from the media, one's parents, or a generalized "they." For example, Lana's journal mentions an abstract, third-person authority, often in the form of media accounts that influence what she does. The origin of these accounts is not always clear, but they nonetheless create a web of ostensibly reliable sources.

There is word floating around of another hurricane headed our way.
(Lana)

We received word today (from a friend that is a reliable source) that the dike that is holding up a canal bank nearby is about to break. If it is to do this, then the water will come so quickly and so fast that the people living around it have no opportunity to think when it happens. Included in these people are all of my mama's family. (Lana)

However watching channel 9 news and their pictures that the helicopter

brought back to us I really knew that no one could have prepared for this. Our lively hood as a community had been lost to the laughing waters of the Tar River. I guess the image which stuck out the most in my mind was the picture of the hog farms where pig were trying to jump on each other in order to survive. I think we will recover from this storm but it will be no time soon. Who knows, it could take several months or years for everything to be back to normal. (Robin)

Building from our understanding of this code, we created a Guttman Scale to assess how individuals experienced messaging from family, friends, and the media.

<p>If I heard rumors at school or work that the “storm of the century” was coming, I would take them seriously.</p>	<p>Agree____ Disagree____</p>
<p>If a close friend told me that the “storm of the century” was coming, I would take them seriously.</p>	<p>Agree____ Disagree____</p>
<p>If a family member indicated that the “storm of the century” was coming, I would take him/her seriously.</p>	<p>Agree____ Disagree____</p>
<p>If a TV media report indicated that the “storm of the century” was coming, I would take them seriously.</p>	<p>Agree____ Disagree____</p>

Home

The code for home (a subcode of environment) was applied to quotations such as the following:

The house itself was still surrounded by about 2 feet of water. Inside you could see that the water had gotten about 15 inches high by the line of leaves, grass, and whatever else was flowing on top of that water. At first my mother was pleased, she had saved most of her furniture, all of her pictures, and her important documents. All she thought was to clean the carpets, wipe down the walls and begin to get life back to normal. That

wasn't the case. (Gary)

I was here thinking that I could save our floors and walls. So I was trying to dry them out with the dehumidifiers. And I was trying to spray Clorox on everything.... At that time we were not staying here we were staying with our daughter. But you didn't have--. (Jenny)

Personal possessions were gone but those precious things that were irreplaceable were lost, the only thing left was memories. Even my friend's whole house was almost completely under water. (Robin)

We just try to hold on until they (FEMA) give (sic) us a new house. They is suppose to put us a double-wide home on block that is going to be 8 feet off the ground. They is suppose to start by November. We done been through this so much that all we know to do is to be thankful of life and our health. (Shawn)

Quotations such as these and others suggest a range of reactions to the notion of home. One woman gave one of her only remaining possessions to a volunteer, while others did whatever they could to rescue their belongings. We decided to use a Guttman scaling for this variable; as mentioned earlier, a Guttman Scale is a series of items assessing increasingly higher levels of an attribute.

Material possessions are not a hindrance to happiness.	Agree_____ Disagree_____
Happiness is more likely if a person has achieved his or her material goals.	Agree_____ Disagree_____
Having a stable place to live is very important to my happiness.	Agree_____ Disagree_____
Rebuilding my house is the only way for me to fully recover from the hurricane.	Agree_____ Disagree_____

Community

The code for *community* captured quotations such as the following:

The most positive thing happened due to the devastation; the streets were filled with people. Folks just walking up the house to ask if there was anything they could do to help. Other people walking by with plates of sandwiches for anyone that may need to stop for a short break and grab a bite to eat. In the middle of all the destruction was a wonderful human spirit that left no one feeling hopeless. That small-town atmosphere could not have been more evident than during those couple of days. I hope that others as well as I remember that spirit along with the thoughts of what was truly “The Flood of the Century.” (Gary)

Here is the corresponding Likert scale.

I have never seen a community pull together as much as our community did during the relief efforts.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Property/Objects

Some participants mentioned how certain resources become especially valuable during the flooding—such as boats, drinking water, and food.

People needed food, water, and gas, yet nobody could get in to deliver it. It was a total nightmare. Finding eggs, bread, and milk were like finding gold. (Sheila)

The following item was constructed to help measure the heightened value of certain property or objects.

Finding eggs, bread, and milk was like finding something precious.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Most possessions in my house became more important to me during the flooding.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Most possessions in my house became less important to me during the flooding.

6	5	4	3	2	1
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Organizations

References to *government organizations*, such as the Federal Emergency Management Agency (FEMA), indicate a range of experiences from no contact with staff to personal contact with FEMA staff coming to their homes.

With the National Guard in place and a military curfew in place it felt like a war zone in which you can't escape. (Craig)

We didn't have time to go stand and see if the Salvation Army could help us or the Red Cross could help us. We did—I did take time to get a FEMA number. FEMA came. And they said, "Well you can save your walls." (Jenny)

With these examples in mind, we again create a Guttman Scale to assess increasingly higher levels of an opinion.

Government organizations were critical in efforts to help people recover from the hurricane.	Agree____ Disagree____
Government organizations were of some help to some people.	Agree____ Disagree____
Government organizations were not present in my community.	Agree____ Disagree____
Government organizations created unnecessary obstacles and were unhelpful.	Agree____ Disagree____

Timescale

The code *timescale* provides insight into many issues, such as the moment-by-moment unfolding of the storm. It also provides a deeper look at how survivors look back on the flood.

Floyd will remain a significant part of my college memories and history. The rumor is that this only happens once every 500 years. I hope that rumor remains true. (Vonna)

Looking back, I will never underestimate a hurricane again. (Tab)

Here are questions we constructed to attempt to capture how people reassess the storm over time.

In retrospect, the storm was even worse than I thought it was at the time.

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

My feelings regarding the storm’s severity have not changed.

1	2	3	4	5	6
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Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree
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In retrospect, the storm was not as bad as it seemed at the time.

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Timescale provides insight into how people measure time differently depending on what is happening to them. Those trapped in a safe place experience a timescale differently from those who were rushing to save their possessions.

Having just moved to coastal North Carolina from land-locked Memphis, TN, dealing with a hurricane was all new. I got caught up in the hype Wednesday, September 15. My new husband was two hours away at the time, at our home-in-progress on Harker's Island. As the skies remained thick and gray, and the news showed the largest swirl of storm which I have ever seen, I grew increasingly anxious that he should be home with me. Finally, at about 1 p.m., he called to let me know that he was headed my way and was bringing his mother, Juley, to our apartment, which is maybe 300 square feet. (Sonya)

Our current is back on. My boyfriend returned home safe and sound, after making a thirty minute trip into an hour and a half because of flooded roads. (Lana)

I went to the grocery store and to the liquor store, where things were moving at an unusually fast pace. I sat and watched the news. (Sonya)

The following closed-ended question was constructed to address the experience of one's timescale.

During the flooding, time seemed to stand still. One hour felt like much

longer.

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

During the flooding, time seemed to go unusually fast. One hour would go by quickly.

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Mildly disagree	Mildly agree	Moderately agree	Strongly agree

Review

Exploratory sequential mixed methods is a particular approach to designing a study involving both a qualitative and a quantitative component. In this design, we started with a qualitative phase that generated codes that we then used as variables to be measured in the second, quantitative phase.

After completing this article, you should be able to:

- Describe an explanatory sequential mixed methods design.
- Use codes and themes from a qualitative study to develop a questionnaire.

Reflective Questions

1. Below are quotations coded to *decision making*. What kind of survey question would you construct to help measure this variable?

In the middle of September, I woke up to take a bath. My friend told me to go outside and see a huge flood on 10th Street. I thought it was no big deal because Dennis came and gave us a lot of a wind and rain. I went to the third floor of Umstead to look out the window. To my

surprise I saw a flood that was flowing fast as a river. It was my first time that I actually seen a flood. (Lanis)

I remember when I got back from Walmart that night and pulled in and the parking lots was fine. I took the food and candles inside and when I walked back outside there was water almost all the way up to my car. I didn't know what to do. I didn't want to lose my car but there was nowhere else to put it. I looked over to the other part of the parking lot and it didn't have any water on it. I immediately got in my car and moved. I then started seeing people in the complex putting their cars on the grass so that the water wouldn't get in. I was very scared. When the next day came we went outside and saw the devastation and it didn't seem bad from my part of town but little did I know as soon as I turned on the TV what would I see and hear about. To me it was worse than a flood zone. (Diana)

And then there was darkness. Never before had I lived without electricity. Without this necessity it left me feeling very alone. I noticed people cooking outside and I met many of my neighbors that I never really had gotten to know. During the first day without power I had decided that I would drive back to PA because the electricity was not supposed to come back on for a few days. That idea failed miserably, though. All roads out of Greenville were flooded. This left me feeling completely helpless and even more alone. (Mina)

I live in an apartment here in Greenville. With Hurricane Floyd approaching, I decided to return to my mother's house, along with my girlfriend, to ride out the storm. She lives about 45 minutes away in Deep Run, outside of Kinston. I expected to be gone for maybe a couple of days, but I was there for over a week, locked in Kinston

by the flood waters. Luckily, my mother's house had no flood waters near it or no damage and my apartment was fine as well. While I was at her house, I was able to drive around Kinston fairly well, I just could not return to Greenville. While there was little flood damage in the small town of Deep Run, Kinston was hit very hard as was Greenville. It seems like all I did was watch the footage on the news of the hardships my neighbors in Eastern NC were going through. The happenings were unbelievable. The Flood water was (and still is) devastating. People lost homes, and even towns it seems. Thousands of ECU students lost homes and one lost his life. (Michael)

2. What is the primary thrust of your research question—exploratory (inductive) or explanatory (deductive)?
3. Is the main emphasis of your study qualitative or quantitative or do they play an essentially equal role in your study?

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