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## Chex Mix™ Data Analysis Activity

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### ABSTRACT

This article presents a pedagogical strategy that uses Chex Mix™ as a visual and physical means of helping students learn data analysis. The manipulative is used to guide students to a deeper level of analysis by looking “within” and “between” data sources. Specific steps are shared about using Chex Mix™ snacks to teach the data analysis process and assist students in identifying and recording major themes that emerge from the examination of interviews, observations, documents, and other qualitative data sources. The use of the researcher’s reflexive journal is emphasized in recording the process undertaken to identify themes.

Keywords:

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Qualitative research;  
qualitative interviews;  
data analysis

### Introduction

As a faculty member, I work diligently to improve my own data analysis skills even as in the classroom I train novice qualitative researchers to dig deeper into the data. In my research methods courses, I developed a method to teach graduate students how to conduct data analysis using any variety of Chex Mix™ snacks. The activity gave them the ability to physically manipulate a “data set,” which helped them to understand the deeper nuances of analyzing and re-analyzing data. I hope that this activity will assist other novice researchers in becoming more adept in their analysis of various data sets.

The key to deep data analysis is to continually “look, look, look” (Erlandson et al. 1993, 4) a phrase emphasized in the retelling of Samuel Scudder’s (1874) article detailing his training as a researcher. Erlandson et al. (1993) noted, “the researcher him- or herself becomes the most significant instrument for data collection and analysis” (39). Usually introductory qualitative methods course instructors put more emphasis on data collection skills: interviewing and observations. After all, analysis requires that you have to have something to analyze! However, as Erlandson et al. (1993) suggest, developing strong data analysis skills is just as important as cultivating data collection competencies. This article describes how the Chex Mix™ activity furthers this goal. Specifically, it provides a way for graduate students to experience coding

and recoding of data multiple times, write descriptions of data groupings, develop themes and categories from the coded descriptions, and identify similarities and differences in codes developed from different data sets.

### The chex Mix™ data analysis strategy

Higher education faculty may be reluctant to engage in activities that are creative or fun when students need to learn specific research skills. However, I am not the first to suggest using manipulatives to teach abstract data related concepts (Agago and Anderson, 2019; Waite 2011). At any age level, models, manipulatives, and visual aids can assist learners by making abstract ideas more concrete. The Chex Mix™ activity, I have found, is non-threatening but concrete. As Willis (2007) suggests, “when students are engaged and motivated and feel minimal stress, information flows freely through the affective filter in the amygdala and they achieve higher levels of cognition, make connections, and experience ‘aha’ moments” (1). The Chex Mix™ data analysis activity provides an opportunity to teach data analysis in a fun way that challenges the learner while promoting autonomy (Williams 2006).

I have used the Chex Mix™ activity during a 3-hour graduate level intermediate-level qualitative methods course taught in a 15-week semester.

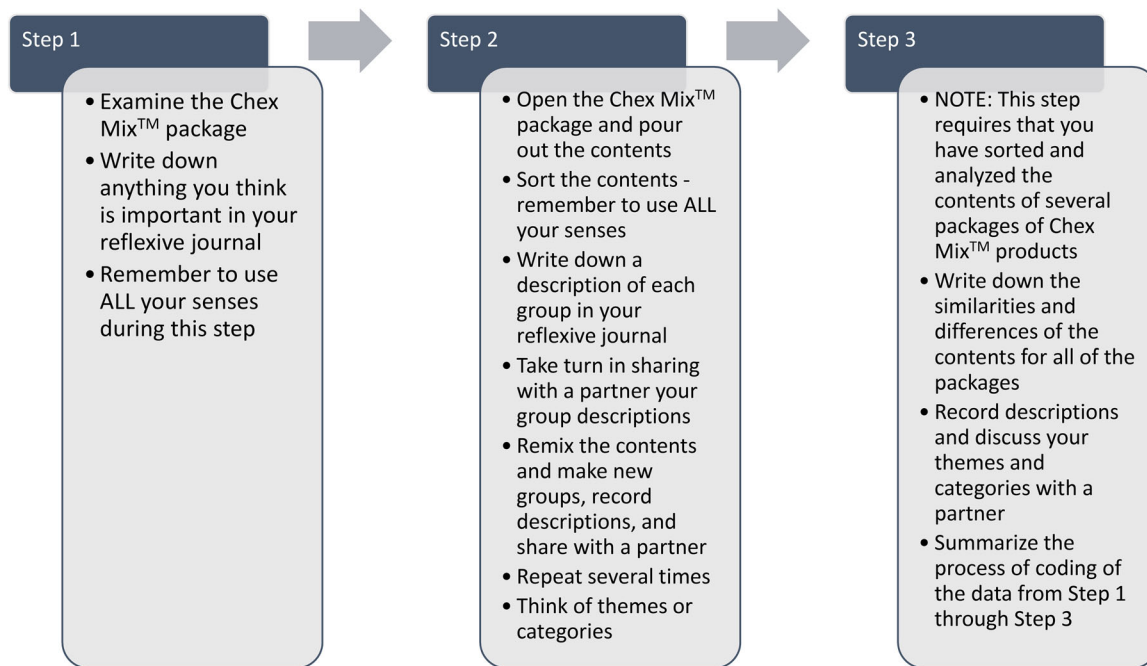


Figure 1. Chex mix activity steps.

Students are required to collect and analyze multiple data sources from a minimum of three participants. Students engage in the Chex Mix™ activity around the time all participant interviews and most transcriptions have been completed. Prior to the review session the graduate students have usually conducted a preliminary analysis of at least one of their data sources. Plan on 60 minutes for completing steps 1 and 2 (see Figure 1). Another 60-minute session will be needed to complete the remainder of the activity, which will include a review of steps 1 and 2. I continue to reference the activity throughout the remainder of the semester. I have also used a modified version of the Chex Mix™ activity during a 1-hour review session with graduate students who were struggling with data analysis. Several attendees indicated that they had not been sure how to proceed after their initial coding of the data and that the truncated version of the activity had made them understand their next steps much more clearly.

The activity is very flexible; it can be applied to various forms of data including interview transcriptions, observation notes, artifacts or documents, and field notes (Erlandson et al. 1993, 103). The materials involved are easily obtained and inexpensive; individual bags of Chex Mix™ snacks work best and can be obtained in bulk in many supermarkets and wholesale clubs. Also have napkins, paper towels, or paper plates for students to use in spreading out the snacks. Muddy Buddies™ or various Chex™ cereals are useful for comparison. Lastly, students need a writing

utensil and paper to record their thoughts and responses and gain practice in journaling ideas. The following sections specify the various important components of analyzing qualitative data using this manipulative, which are summarized in Figure 1.

### Step 1 – record contextual information

First, have students examine the bag of Chex Mix™ before opening and dumping out the contents. I encourage students to focus on using all their senses throughout the activity and record even what they might consider to be trivial details. The bag itself provides important contextual information such as the flavor, contents, nutritional information, ingredients, calories per serving and so on. An important skill for novice researchers to develop is recording contextual details for each data source. Field notes or a reflexive journal should be used in documenting this information and students need practice in recording their thoughts and impressions before, during, and after interacting with data. Typically research notes capture items such as setting, time of day, individuals present, a sketch of the location, and so on. However, including what one hears, feels, smells, and tastes when in the research setting provides additional depth to the data collection process and is another layer of contextual information. Seidel (1998) advocated that qualitative data analysis was an iterative and progressive process of noticing, collecting, and thinking. The

initial steps of the Chex Mix™ activity reinforce the process of noticing.

While the Chex Mix™ activity is primarily observational in nature, the process of data collection and analysis is similar with other types of qualitative data. Observation and writing skills are emphasized in every step of the Chex Mix™ activity. The information contained in the researcher's reflexive journal is critical and should also be considered as a data source. As Lincoln (2000) noted "the reflexive field work journals are, admittedly, intensely personal sets of writing. They are, however, a necessary tool of qualitative researchers" (252).

### **Step 2 – coding "within" the data**

After recording the contextual information appearing on the bag, students should look at the data holistically and start the collecting and coding processes (Seidel 1998). Have the students pour the contents of the bag onto a paper towel or paper plate.

Students should sort the Chex Mix™ pieces and record the characteristics or brief phrases about each piece during this step in their journal. These descriptions form the basis for the first set of codes. For example, in describing a round pretzel the students would write down the shape, color, estimated size, number of pretzels, and so on. After completing the description for that group, students should systematically record a description for each of the other Chex Mix™ pieces.

After this initial examination of the data set, have students work cooperatively in pairs or triads to read or listen to others' written descriptions so that they see the terminology each person has used. Cooperative work is appropriate at this time as "working together results in a greater understanding than would likely have occurred if one had worked independently" (Panitz 1999, 12). Students often revise their descriptions at this point to provide additional details based on others' work. In this first coding effort students may start to identify some very basic themes and should write down these ideas in their reflexive journal. However, the students must also be challenged to conduct a deeper analysis of the data.

Next, have the students regroup the Chex Mix™ pieces and describe the new characteristics of the group. The goal at this point is to create such a detailed description that another individual could take their own Chex Mix™ pieces and imitate the sorting of this data. The re-sorting process facilitates discussions on inter-rater and intra-rater reliability and how

to document these groupings and themes in a code book. Some possible groupings based on the visual aspects of Traditional Chex Mix™ include:

- Type – rye chip, squiggle breadstick, round pretzel, square pretzel, Wheat Chex™, Corn Chex™.
- Shape – round, square, regular, irregular, three-dimensional.
- Color or shading – light, dark.
- Fragments versus whole pieces.
- Texture or coating – smooth, holes, bumpy.

Taste and smell might provide other groupings.

During this step, the student is "coding within" the data and gains valuable insights concerning data coding and recoding, learns to document details in a code book, summarizes how the codes emerged in the reflexive journal, applies terminology if using a priori coding, and starts to develop themes that encompass several codes. Although novice researchers frequently stop after the initial analysis, quality research requires recoding data multiple times, repeating analysis of each interview, observation, or document/artifact individually. The Chex Mix™ activity helps students to understand this process.

### **Step 3 – code "between" the data**

In the subsequent phase of data analysis, the researcher looks across similar data – such as if students looked at Traditional Chex Mix™ and compared it to Cheddar Chex Mix™ and Honey Nut Chex Mix™. While all three snacks might contain Chex™ cereals and pretzels, there are discernable differences that should be documented in writing. Examining the themes to determine how to group similar ideas is often challenging to novice researchers. They often end up with many themes and need to consider grouping together related ideas, a process known as axial coding (Strauss and Corbin 1998). For example, the theme of Visual Appearance could encompass the codes of shape and color of the Chex Mix™ pieces. Novice researchers should examine one data type first, such as interviews, when grouping related ideas. They should then repeat this process with the observations, documents, and so on. While the researcher is recoding the data, notes should be made in the reflexive journal as to what information was considered in creating the themes and groupings.

Another phase of "between" coding or noticing (Seidel 1998) follows. In this phase students can compare Muddy Buddies™ or Chex™ cereals, neither of

which have variety of pieces. Muddy Buddies™ also are much sweeter in taste and the coating is more apparent. Students should repeat the steps of contextualizing and coding the data with the more uniform data set, including developing the “within” codes and themes for each of the data types (i.e., Chex Mix™, Muddy Buddies™, Chex™ cereal). They then would examine the set of themes commonalities “between” the data types (e.g., Visual Appearance), which develops the students’ thinking processes (Seidel 1998). Such commonalities often are apparent with data sources such as interviews and observations. However, in some instances a code or theme may be unique and only apply to a specific data source. Thus, when coding between the data types, similarities and differences should be noted for each data type in the reflexive journal and code book.

When conducting “within” and “between” phases of data analysis with their own data, students should select strong examples or excerpts from the interviews, observations, and documents to use in the data analysis section when defining specific themes that emerged from the analysis process. Ideally the examples should be from a variety of sources, not just limited to one specific interview, observation, or other source of data.

After experiencing the Chex Mix™ activity, students should write a detailed summary of their process of analyzing the data. They should be able to articulate their understanding of how to code and recode data, explain how they develop and define themes, and select strong examples or excerpts to demonstrate those themes. Both the “within” and “between” analysis steps should be clearly articulated to the point that another individual could replicate the process. Students then reference these steps in the data analysis section of the papers they write for the course.

#### ***Additional tips for using this activity***

Those deciding to do the Chex Mix™ data analysis as a class activity may benefit from the following practical suggestions. First, have spare writing materials on hand for students to use. Providing journal materials underscores the purpose and importance of the researcher’s reflexive journal. Especially in beginning qualitative methods classes, students need help in developing the dispositions of a researcher.

Second, prepare visuals to refer to throughout the presentation in addition to individual bags of Chex Mix™ snacks for the students. My first approach to this was to present photos of the Traditional Chex

Mix™ flavor, but more recently I have included photos of other savory Chex Mix™ flavors, Chex™ cereals, and Muddy Buddies™. The use of the additional Chex products have allowed students to think about the similarities and differences in the various data types and allowed me to convey that data analysis techniques for the four basic data sources of “interviews, observation, documents, and artifacts” (Erlandson et al. 1993, 85) are very similar. Having these visuals also facilitates discussions on coding “within” and “between” the data types.

Third, although this activity uses Chex Mix™ snacks, this activity can be modified for other items, although my students have enjoyed eating the “data set” at the end of the class. I have had several international students state that they were unfamiliar with this food item. You may find some individuals are allergic to some of the snack items, which is another important reason for them to read the snack bag in the initial step of the activity. If you use a different type of snack, such as one containing nuts, you should check for allergies ahead of time.

## **Conclusion**

The Chex Mix™ data analysis activity provides a means to teach both basic and advanced qualitative analysis techniques. However, this activity goes further in demonstrating the “between” coding of data, thus extending Waite’s (2011) deck of cards activity. The Chex Mix™ activity is easy to implement and is a change of pace for students due to its hands-on aspect. Several students who experienced this activity have shared that they more quickly grasped the idea of coding and recoding data and the importance of “within” and “between” levels of analysis with data from their own projects. Students have also expressed an appreciation of the importance of the researcher’s journal in documenting the various steps in the data analysis process as they were able to see the value of incorporating such information into their data analysis descriptions. Since implementing the activity, I have noted more depth in students’ coding analysis and theme development in their papers, which has translated to more robust discussions and conclusions in their written work.

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