

PART I

Background and Theory

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1 Interaction Analysis

An Introduction

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Interaction analysis has become so prominent among researchers across disciplines that a handbook is warranted as a way to review and organize what has been accomplished with this method, as well as present what we might expect as future trends or opportunities with this method. Generally, interaction analysis has been attributed to sociologist Mildred Parten, who observed preschool children in the 1930s, and social psychologist Robert Freed Bales, who developed systems for evaluating the social interaction of small groups in the 1950s.

Interaction analysis is a systematic research technique for reliably unitizing and coding sequential naturally occurring interaction behaviors and making valid interpretations and inferences from those data to the context in which the observations occurred. Even if a researcher has placed dyads or groups in experimental conditions to communicate or interact based on a prompt (usually a condition of the independent variable), researchers acknowledge that conversation naturally occurs around the premise that participants act and respond to one another spontaneously (Bavelas, Gerwing, Healing, & Tomori, 2017).

Observable behaviors in these exchanges are captured and coded. In an interaction, behaviors – verbal, nonverbal, textual – are what participants say, do, or write to one another in a dyadic or group setting and what other participants react to. That is, behaviors are artifacts that can be captured and codified. The researcher carefully and thoughtfully codes these behaviors relative to one another, within the context in which the interaction occurred, and with respect to theoretical and methodological claims. Thus, the researcher situates him/herself as an interpreter of the conversation, just as conversational partners would do in situ.

Interaction analysis is not about participants' perceptions as gathered through questionnaires. Presumably, a participant's thoughts, attitudes, and judgments guide his or her communication. However, in interaction analysis, "the details of social interactions in time and space and, particularly, in naturally occurring, everyday interactions among members of communities of practice" (Jordan & Henderson, 1995, p. 41) are the focus of study. Interaction systems vary in the type of interaction they examine. Some of the most common are task content, message function, and message structure. While most interaction analysis research designs focus on talk or text, studies of nonverbal behavior are also conducted. Let's take each term of *interaction analysis* in turn.

Interaction requires that researchers identify two or more individuals involved in some type of activity related to one another; that is, everyone participates, with conversation flowing from one to all other members, or from one member to another in front of the other members. For example, a conversation may be captured by audio or video recording (and then transcribed¹); or the interaction may be observed and coded by researchers in real time. A public (often official) exchange of views may be captured by video or audio recording. A chat function may capture suggestions from team members recorded in an online brainstorming session. Important to all three of these examples, the interaction is natural and captured as it occurs without researcher intervention. The flow and emergent nature of conversation and other human interactivity, as well as group processes, are the key items of interest.

Analysis requires a systematic investigation in which the researcher specifies the research question (e.g., “How are team members’ perceptions of strategic communication related to the way messages function?”, Beck & Keyton, 2009, p. 227) or hypothesis (e.g., “Negative procedural statements will be negatively linked to team success,” Kauffeld & Lehmann-Willenbrock, 2012, p. 136). Over time, several interaction analysis coding schemes have been developed and tested (see examples of interaction analysis coding schemes in Part V of this volume) that now allow researchers to generate hypotheses about which type of interaction events occur more frequently, or prior to or subsequent to one another. More typically, however, many researchers use research questions to frame their investigations as new contexts are being explored (e.g., juries, Poole & Dobosh, 2010; text and voice chat rooms, Jepson, 2005). Thus, researchers are looking to identify frequencies and patterns of interaction codes or categories, as well as detect sequential dependence among those observations (Bakeman & Gottman, 1997).

Thus, interaction analysis can answer questions such as: What do interactants do in this setting? And, how do they do it? For example, in a meeting, are interactants making decisions or managing conflict, or both? How are city council members performing their tasks of informing citizens or stalling in making a decision? Interaction analysis can also answer questions such as: How do task force members create new regulations? How is their interaction different when the most influential member is absent? Interaction analysis is a research method for helping researchers to identify and evaluate repeatable and explainable patterns in turns at talk that are beyond a level of which participants are aware at the time of its occurrence. That is, researchers using deductive or inductive theorizing can find instances and patterns in conversations that would remain hidden from the conversational partners or a casual observer.

Conducting studies with interaction analysis, however, costs researchers significant time and effort. So, why undertake such an analysis? Researchers use interaction analysis for detailed analyses of what group members say and how they say

¹ There is also the special case of conversation that occurs over an audio channel with push-to-talk buttons. In these cases, speakers control who hears their speaking.

it. The method allows the researcher to take on the role of a complete observer, as the unitizing, coding, and analysis of the interaction is performed out of the group setting. This allows the researcher to focus on the interaction without his or her attention being drawn back to any particular group member or to any one part of the interaction. In many ways, it's like taking a specimen back to the laboratory for refined, detailed examination. The other advantage is that the type of data produced by interaction analyses, i.e., micro-level data, can be analyzed for individuals and the group over time (within a group interaction or across many group interactions). The data can also be aggregated by interaction function, group member, or at the group level. So, while interaction analysis takes time and effort, a researcher can *see* what happened rather than rely on the perceptions of group members after the interaction is over.

Because interaction analysis is intended to be used on naturally occurring interaction, the researcher must be able to record the dyad's or group's conversation. In some cases, recordings are routinely made. Either way, persons being recorded (unless the recording is for the public record; see Beck, Gronewold, & Western, 2012) must give their consent and a high-fidelity audio or video recording is required. Most frequently, recordings are transcribed manually,² unitized, and then coded by at least two researchers (some software can assist in some of these steps). Reliability checks are performed for the unitizing and coding steps. Once coded, analysis begins.

Selecting interaction analysis as part of the research design carries with it several assumptions. First, the method assumes that people can make valid and reliable judgments about the text they are coding.³ Second, interaction analysis is based on the premise that higher frequencies of coded acts are more theoretically important, as these coded acts represent the bulk of the interaction. However, recent studies have countered this assumption by suggesting that interaction types that occur less frequently may have disproportionate influence (see Keyton & Beck, 2009; Beck & Keyton, 2014). Third, interaction analysis accounts for (or codes) every utterance in the dataset. Fourth, interaction analysis is concerned with the interactive level (i.e., what acts precede or follow) over the content (i.e., topic of conversation) level of the dataset. Fifth, interaction analysis assumes the interact is a mediator, not a moderator of the interaction that follows. Sixth, interaction analysis is concerned with talk over time; a time dimension (or sequence of interactions) must be part of the study design. That is, in interaction analysis, acts only have meaning in terms of the acts that precede and follow. A researcher may only count the frequency of acts as a method of providing basic information about the conversation. However, more detail and nuance are uncovered if the interact level of analysis is also performed.

² At the date of publication, software has not yet been developed that reliably identifies a specific speaking voice from other speaking voices in a group interaction.

³ My experience in working with many researchers, including student researchers, is that coding is a skill that not everyone has or wants to develop. Coding is very detail-oriented; some individuals can improve their skill with practice whereas others cannot. Having the time to spend on coding is another factor in addition to the skill issue.

Why Do Interaction Analysis?

Researchers use interaction analysis as a method to identify and interpret the interrelated verbal or textual features or functions from a stream of conversational elements. The next *why?* is more important. As Bonito and Sanders (2011) argue:

Without close attention to the specifics of group members' conduct and interaction, it is easy for oversimple generalizations and unexamined assumptions to go unchecked, and to overlook that members' conduct and interaction is the basis for much that does not happen, as well as what does happen. For example, just because the conditions for conflict arise, actual conflict does not necessarily occur (p. 348).

Interaction analysis is the method by which researchers can understand the nuance of when and how, for example, conflict arises.

Acts that sequentially create conversation can be quite short (e.g., “yeah” or a spontaneous but fleeting facial gesture) or longer (a turn at talk). By coding acts (e.g., complete thought,⁴ sense turn, thought turn, sentence-like units, turn at talk, utterance, 30 seconds of behavior) in their sequential order, researchers can pay close attention to the surface-level intent and function of messages, determine the effects of messages, and examine messages for their relationship to one another over time (Tucker, Weaver, & Berryman-Fink, 1981). In essence, interaction analysis provides three benefits: (a) it provides a picture of how acts are distributed across the group's conversation and across group members, (b) it showcases the interactive structure of the conversation, and (c) it makes detection of patterns and sequences of acts possible. Knowing this level of detail of human activity “helps us to understand both the development and predictability of interaction processes . . . [and] explain unexpected interaction functions or outcomes” (Meyers & Seibold, 2012, p. 341). Too often, what researchers do not capture in the sequential process of conversation is how “participants inevitably draw upon and create shared understandings, which shape their subsequent actions and meanings” (Bavelas, Gerwing, Healing, & Tomori, 2017, p. 139).

Interaction Analysis Is Quantitative

Interaction analysis is a form of textual analysis (other forms are content analysis and discourse analysis) and is quantitative as the researcher assigns acts to nominal categories. Qualitative interaction analysis research does exist.⁵ As an example of quantitative interaction analysis, Keyton and Beck (2009) and Beck and

⁴ A complete thought unit is one of the most frequently used units of analysis in interaction analysis. A complete thought unit is any statement or utterance, of any length, that has meaning on its own.

⁵ An exemplar of qualitative interaction analysis is Paugh and Izquierdo's (2009) investigation of family mealtime.

Keyton (2014) captured the conversation of a breast cancer survivors group and discovered that task-related messages both preceded and followed relationally oriented messages. Moreover, task-related messages dominated the group's hour-long conversation, even though the primary task of the group was to be supportive of one another. This called the researchers' attention to the power of the less frequent relationally oriented messages, as well as how the two types of messages were interrelated within a conversation. Using descriptive statistics and chi-square analyses, the researchers drew readers' attention to how coding was distributed across the IPA categories. Then, by isolating sequences of task-relational-task interactions, the researchers provided examples of the group's conversation to support the researchers' claims. For example, use of relational talk after task talk confirmed, extended, or qualified information from another speaker; signaled the direction, continuance, or transition of the conversation; or signaled identification of other members. As a result of these analyses, the researchers could demonstrate that in a support group, advice is not simply given by one member to another. Rather, the researchers could demonstrate with examples that, in this support group setting, advice is interactive and layered.

Because of the interest in the temporality of interaction analysis, some analytical methods (e.g., ANOVA, regression) are not suitable whereas other analytic techniques are (e.g., autoregressive, integrative, moving average; cross-recurrence quantification analysis; lag-sequential analysis; Markov and semi-Markov modeling; moderated dependency analysis; multilevel modeling, phasic analysis) (Bakeman & Gottman, 1997; Bakeman & Quera, 1995; Davis, 2017; Hewes & Poole, 2012; VanLear, 2017; see also, all in this volume, Rack, Zahn, & Mateescu, Chapter 14; Quera, Chapter 15; Magnusson, Chapter 16; Bonito & Staggs, Chapter 17; and Poole, Chapter 18).

The Method of Interaction Analysis

Once verbal, nonverbal, or textual interaction is captured, the researcher creates a transcript and verifies it against the capture of the data. With transcript in hand, the next step is to isolate units of talk from within the continuous stream of talk or activity, code those units independently from at least one other coder, analyze units relative to the talk that precedes and follows it, and present a valid interpretation of the talk back to the context. Sometimes, feedback is also given to participants who generated the talk. Thus, interaction analysis is a research method that allows for the systematic capture, unitizing, coding, and interpretation of naturally occurring conversations.

Coding Schemes

The coding scheme (or set of standardized coding rules) is central to interaction analysis. Coding schemes may be developed inductively from a set of observations (see Pavitt, 2011; Sabee, Koenig, Wingard, Foster, Chivers, Olsher, & Vandergriff,

2015), be theoretically derived, or may already exist (see Part V of this volume for a list of coding schemes and Tschan, Zimmermann, & Semmer, Chapter 10, for the development of new coding schemes). This latter deductive approach allows researchers to use coding schemes of carefully defined categories based on theory (in addition to knowing the degree of reliability and validity other scholars have found). The use of decision trees is recommended by Bavelas, Gerwing, Healing, and Tomori (2017) as a way to work through the steps required to create a coding scheme. Validity and reliability studies are the next step (see Seelandt, this volume, Chapter 12).

The domain of interaction analysis coding schemes is quite varied. Some coding schemes contain only a few codes and are context dependent. In their Mother Adolescent Interaction Task coding scheme (MAIT), Pineda, Cole, and Bruce (2007) used three broad codes (e.g., critical behavior, depressive behavior, and positive behavior) to assess both the child's and mother's verbal and nonverbal behavior during their interaction. Other coding schemes are quite broadly construed and can be used in many different types of interactions. Bales' (1950) Interaction Process Analysis (IPA) coding scheme is one of these. It has 12 coding categories organized into four macro categories of socioemotional/positive reactions, socioemotional/negative reactions, task/attempted answers, and task/questions. Coding schemes can be specific to a type of conversational feature (e.g., Group Working Relationships Coding System, developed for coding conflict; Poole & Roth, 1989), or specific to a contextually specific type of conversation (e.g., Siminoff Communication Content and Affect Program, developed for health settings; Siminoff & Step, 2011). At the extreme, a coding scheme can code people simply as *talking* or as *silent* (Cappella, 1984; also see Yong, 2016).

Thus, coding schemes must define what counts as a codable *act*, making the relationship between coding scheme and codable unit of paramount importance. In early coding schemes, the most typical unit of analysis of conversation was the *act*, which Bales (1950) described as "the smallest discriminable segment of verbal or nonverbal behavior" that could be coded (p. 37). Later, Folger, Hewes, and Poole (1984) argued that units of social interaction can range from 300 milliseconds to a full exchange among speakers. Thus, the unit of analysis is not fixed, but rather is selected based on theory, the coding scheme, and the hypothesis/research question. Sometimes, the unit of analysis that becomes the pivotal aspect of a conversation is not discovered until other units of analyses have been attempted. So, while a unit of analysis is not fixed, it is also not arbitrary (see Reed, Metzger, Kolbe, Zobel, & Boos, this volume, Chapter 11 for a syntax-based method for unitizing interaction). Researchers must have good reasons for using the unit of analysis selected and describe this decision choice.

Coding schemes must also be meaningful to human interaction, but validity and reliability must be taken into account. That is, the coding scheme should not distort the meaning of the text solely to achieve acceptable levels of validity or reliability. As coding schemes are used over time, they are either validated or revised as other

researchers code different types of interaction and ask different types of research questions.

Regardless of which interaction analysis coding scheme is selected, researchers are advised to consider six features before embarking on a research study (Trujillo, 1986). What philosophical perspective frames the design and study? What is the conceptual and operational focus of the coding scheme? How much and what type of observer inference will be required? Is the design suited to interaction analysis? Finally, what is the potential effect of recording the conversation on coding judgments (e.g., clarity of recording)?

Finally, it should be pointed out that training coders is a significant investment. Coders must learn the coding system, practice coding, and achieve the required level of intercoder reliability. Once the coding scheme is fully developed and verified, interaction analysis is conducted by trained individuals (scholars or their research assistants) while the interaction of interest is occurring, or afterward from an audio or video recording or transcript. Coding is aligned with a specific interaction event and inherent to interaction analysis. When researchers code the interaction of people, they are observing naturally occurring interaction, and they are coding a behavior that just occurred. When coding is done from audio, video, or transcripts, researchers can often code for finer-grained detail than (a) research participants can rate themselves or (b) researchers can rate all research participants after the interaction has concluded (Samter & MacGeorge, 2017).

The characteristics common to all coding schemes for interaction analysis are several: (a) the focus is the interaction of two or more individuals; (b) the interaction must be naturally occurring, not scripted; (c) coding is done by trained researchers or research assistants; and (d) the data are captured sequentially allowing for more basic analyses of frequencies, and more sophisticated sequential analyses.

Distinguishing Interaction Analysis from Content Analysis and Conversation Analysis

Over a period of years, Krippendorff (2004, 2013) has set the standard for *content analysis*, which is both different from and similar to interaction analysis. Similar to both methods are the isolation and unitizing of discrete units, coding the units, and making inferences back to the context from which the text was drawn. The primary difference between the two rests on the requirement of interaction analysis for maintaining sequence of the units, which is essential to coding acts or interacts, and often not present in content analysis. Interaction analysis also has the requirement of naturally occurring interaction among multiple speakers, which content analysis does not.

For example, Humphreys, Gill, and Krishnamurthy (2014) used content analysis to code the amount and types of personally identifiable information from public Twitter messages to answer several research questions. Twitter

messages are asynchronous and asymmetric. Two of the research questions were: RQ1: “How often is locational information articulated in public Twitter messages”; and RQ2: What is “the degree to which we can assess where these behaviors are occurring – work, home, or outside of work and home (or what one might call public space)” (p. 847). These questions are typical for content analysis, as the aim is to describe what is happening and how frequently a type of behavior occurs. Alternatively, analysis of text message conversations would be better suited for interaction analysis methods, as *who texts what* presents a demand on the receiver for responding in a sensible fashion. Text messages are synchronous and symmetric. Thus, units can be coupled, minimally into repeating binary exchanges, but also examined for how topics reoccur or are dropped.

Examining the relationship of conversation analysis to interaction analysis, there are few similarities. Both use naturally occurring data and rely on the sequence of talk both within and between speaking turns. However, conversation analysis is a more detailed analysis, and requires a different type of transcription – one that more finely annotates, for example, the allocation of turn taking. In conversation analysis, researchers pay attention to a particular type of discourse act within an interaction. For example, Lee, Tsang, Bogo, Wilson, Johnstone, and Herschman (2017) examine the moments in the conversation of family dyads in therapy when the therapist joins the two family members (i.e., a joining moment). Other parts of the conversation are not analyzed. For conversation analysis, transcripts are marked with the milliseconds of pauses and overlaps; all physical actions are also noted. As a result of this highly micro-level of analysis, conversation analysts typically investigate only one interaction with the goal of situating the conversation of these speakers in a location and context requiring this type of interaction (Beach, 2008). Conversation analysis studies are particularly good at determining how conversation works in different conventional settings. For example, Pontecorvo and Arcidiacono (2016) used conversation analysis to explore how children and fathers perform argument in daily talk. These authors discovered that a child can resist his father’s instruction during family dinnertime conversation by using an elaborated argumentative strategy.

Coding vs. Rating

In comparison to interaction analysis, *rating* can be done by the researcher, but also by participants as self-report data, once the interaction being studied is completed. Retrospective rating is characterized by the researchers or participants assigning a number representing the degree to which the phenomenon was displayed. Ratings are more typically made on global impressions. Bales and Cohen (1979) suggest that raters making self or other retrospective ratings tend to have a positive bias in their ratings, whereas coders assign a wider distribution when coding. The positive bias phenomenon is well studied (e.g., Wilson, Meyers, & Gilbert, 2003). Thus,