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## Text Analysis: Qualitative and Quantitative Methods

### Introduction

There is growing interest across the social sciences in the systematic analysis of “text.”<sup>1</sup> Little wonder: Most of the recoverable data about human thought and human behavior is text of one kind or another. In this chapter, we survey methods of text analysis in the social sciences and particularly how anthropologists have used those methods to look for meaning and pattern in written text.<sup>2</sup>

We cover two broad types of text analysis: the *linguistic tradition*, which treats text as an object of analysis itself, and the *sociological tradition*, which treats text as a window into human experience. For the linguistic tradition, we review how anthropologists have collected and produced texts, analyzed indigenous literatures, discovered patterns and structures in performance styles, and compared the production of narratives within and across cultures. For the sociological tradition, we review the methods of schema analysis, grounded theory, classical content analysis, semantic network analysis, cognitive mapping, and Boolean analysis.

Throughout, we focus on methods for collecting and analyzing written texts such as political speeches, song lyrics, personal diaries, transcriptions of interviews, newspaper editorials, and so on. Many of these methods serve just as well in dealing with images, such as photographs, home movies, video tape, commercial movies, kinescopes of old television shows, etc.

In the study of text, some scholars use methods identified with the humanist tradition while others use methods identified with the positivist tradition. The former

involves interpretation and the search for meaning. The latter involves the reduction of texts to codes that represent themes or concepts and the application of quantitative methods to find patterns in the relations among the codes. Nowhere is Eric Wolf's aphorism that "anthropology is the most humanistic of the sciences and the most scientific of the humanities" (1964:88) better demonstrated than in the practice of text analysis.

### Anthropology: A Passion for Collecting Texts

Debates about the value of structuralism, functionalism, historical particularism, materialism, and postmodernism come and go, but the value of faithfully produced texts is undisputed. Among Franz Boas's lasting contributions is the corpus of texts he collected, translated, and published (or deposited in archives) from speakers of Bella Bella (1928b), Sahaptin and Salishan (1917), Keresan (1928a) and, with George Hunt, Kwakiutl (Boas and Hunt 1902–1905, 1906; Boas 1910, 1935–1943). In 1893, Boas taught Hunt to write Kwakiutl, Hunt's native language. By the time Hunt died in 1933, he had produced 5,650 pages of text—a corpus from which Boas produced most of his reports about Kwakiutl life (Rohner 1966).

To the extent possible before the invention of voice-recording devices, Boas trained his students and collaborators to collect verbatim texts.<sup>3</sup> Following Boas's example with Hunt, Paul Radin worked with Sam Blowsnake, a Winnebago. Blowsnake wrote the original manuscript (in Winnebago) that became (in translation) *Crashing Thunder: An Autobiography of a Winnebago Indian* (Blowsnake and Radin 1983 [1920, 1926]). Among Boas's other students, Swanton (1909), Goddard (1911), Kroeber (1907), Lowie (1930), and Sapir (Sapir and Dixon 1910; Sapir and Curtin 1974; Sapir and Swadesh 1978) collected and analyzed indigenous language text, and Margaret Mead produced hours and hours of cinema verité about Bali dance—a rich, textual record that can be turned to again and again as new insights and new methods of analysis become available.

The concern for the collection and archiving of text remains undiminished in anthropology. In the 1970s, Eric Hamp edited the Native American Texts Series of the *International Journal of American Linguistics* (see, for example, Furbee-Losee 1976; Bernard and Salinas Pedraza 1976). As the literary language of a pre-Colonial Era civilization, Maya has attracted particular attention. Munro Edmonson's translations of the books of *Chilam Balam* (1982, 1986) and Dennis Tedlock's translation of the *Popol Vuh* (1985) are outstanding examples.

Following the example of Boas with Hunt and Radin with Blowsnake, Bernard (Salinas Pedraza and Bernard 1978; Bernard and Salinas Pedraza 1989), El Guindi and Hernández Jiménez (1986), Lurie (1961), and Sexton (Bizarro and Sexton 1981, 1985), among others, have helped indigenous people create narratives themselves in indigenous languages. Bernard (1997) has provided indigenous people with the computer technology and training to produce their own books in their own

languages. Here again, the emphasis is on the production of texts, not on their analysis. (See Salinas Pedraza [1997] and González Ventura [1997] for indigenous perspectives on the production of indigenous-language text by computer.)

### Analysis of Indigenous Literature

There are about 240 languages in the world spoken by more than a million people. Some of those languages have very long literary histories, and while smaller languages are disappearing, other indigenous ones are developing new literary traditions. Postel-Coster (1977) studies an indigenous tradition of novels in Indonesia that goes back to around 1920 when a thriving production of new literature appeared in Malay by western Sumatran, or Minangkabau, writers.

Postel-Coster does not see such novels as a source of factual information, but as the modern continuation of the myth in nonliterary societies. Although novels can not be taken as documentaries, he says, important elements of social reality can be exposed in novels without allusion to actual events. In novels about young couples who must struggle against social rules and disapproval to marry, Postel-Coster finds that “many problems of Minangkabau culture are explicitly dealt with: matrilineal succession, polygynous marriage, the enormous impact of the extended family on an individual’s life, and the question of *merantau*—the traditional emigration of young people, mostly men, to other areas” (1977:137).

Besnier (1995) has studied an indigenous literacy tradition on the Polynesian atoll of Nukulaelae. The texts produced by the people of Nukulaelae include letters, sermons, and announcements of events. Besnier analyzes correspondence by identifying and presenting exemplars of structural regularities. For example, the main body of letters on Nukulaelae “usually begins with a greeting identical to the greeting used in face-to-face interactions (*taalofa* “hello,” a Samoan borrowing). This is followed by references to the health of everyone at the writer’s and recipient’s ends, and sometimes a very long series of invocations to God’s grace and kindness” (Besnier 1995:86). Besnier follows this with a series of exemplars.

Besnier noticed that letter writers “always adhere to a religious reference scheme in opening themes, Christian for the majority, or Baha’i, etc., for the handful of religious converts. In letters written by younger people, the introduction is usually much shorter and more predictable in content than that of letters written by older individuals. These introductions bear many similarities to the beginning of formal speeches” (1995:87).

Using literary methods of analysis, then, Besnier identifies covariation between certain elements of style in text and independent variables like religious affiliation and age.

### Patterns in Performance

The discovery of regularities in narrative performance is achieved mostly through the analysis of written text (for a review, see Hanks 1989). The work of Dell Hymes is of singular importance. In 1977, Hymes reported that “the narratives of the Chinookan peoples of Oregon and Washington can be shown to be organized in terms of lines, verses, stanzas, scenes, and what many call acts.” Hymes felt that this discovery might be relevant to many indigenous languages of the Americas (1977:431).

Hymes looked at texts in Shoalwater Chinook and Kathlamet Chinook. The texts had been collected by Boas between 1890–1894 from one informant who happened to speak both mutually unintelligible languages. Hymes also examined texts from Clackamas Chinook (collected in 1930 and 1931 by Melville Jacobs) and in Wasco (Wishram) Chinook (collected by Sapir in 1905, by Hymes in the 1950s, and by Michael Silverstein in the 1960s and ’70s). Hymes found that features of Chinook that might have seemed idiosyncratic to the speakers of Shoalwater, Kathlamet, and Clackamas Chinook “are in fact part of a common fabric of performance style” so that the three languages “share a common form of poetic organization” (Hymes 1977:431).

This was a truly important discovery, for it made clear that Native North American texts have something to contribute to a general theory of poetics and literature. Hymes discovered verses, not by counting lines of text “but by recognizing repetition within a frame. . . . Covariation between form and meaning, between units with a recurrent Chinookan pattern of narrative organization, is the key” (Hymes 1977:438).

In some texts, Hymes found recurrent linguistic elements that made the task easy. Linguists who have worked with precisely recorded texts in Native American languages have noticed the recurrence of elements like “Now,” “Then,” “Now then,” and “Now again.” These often signal the separation of verses and “once such patterning has been discovered in cases with such markers, it can be discerned in cases without them” (1977:439). The method is to look for “abstract features that co-occur with the use of initial particle pairs in the narratives” of other speakers who use initial particle pairs. The method, then, is a form of controlled comparison.

In a series of articles and books (1976, 1977, 1980a, 1980b, 1981) Hymes showed that most Native American texts of narrative performance (going back to the early texts collected by Boas and his students and continuing in today’s narrative performance as well) are organized into verses and stanzas that are aggregated into groups of either fives and threes or fours and twos. Boas and his students organized the narratives of American Indians into lines. This hid from view “a vast world of poetry waiting to be released by those of us with some knowledge of the languages” (Virginia Hymes 1987:65).

According to Virginia Hymes (1987:67–68), Dell Hymes’s method involves “working back and forth between content and form, between organization at the level of the whole narrative and at the level of the details of lines within a single verse or even words within a line.” Gradually, an analysis emerges that reflects the analyst’s

understanding of the narrative tradition and of the particular narrator. Virginia Hymes emphasizes that it is “only through work with many narratives by many narrators that the analyst builds up a knowledge of the range of narrative devices used in the language and the variety of uses to which they may be put” (1987:67–68).

In his study of Zuni narratives, Tedlock (1972:221) found that such paralinguistic features as voice quality, loudness, and pausing are key indicators of performance (and see Woodbury [1987] for an examination of prosodic features in Yup’ik Eskimo narrative). Hymes points out that the texts recorded by people like Sapir and Jacobs often had paralinguistic features such as nonphonemic vowel length and nonphonemic stress (for emphasis) marked. Some linguists of the time emphasized phonemic transcription under “the unquestioned assumption that linguistic structure should be built up on the basis of referential function alone, to the exclusion of features serving stylistic function” (Hymes 1977:452–453). This wasn’t, of course, how Boas and his students did things. They used all manner of conventions for indicating expressive as well as strictly phonemic features of narratives that they recorded.

Thus, says Hymes, the view of the Boasians that “one should regard and present conventional phonetic habits, expressive as well as referential, comes to seem in the context of ethnopoetics, not old hat, but a cause for gratitude” (1977:453).

Tedlock (1987) showed the exegetical power that linguistic methods can bring to text analysis. He had translated the *Popol Vuh*, a sixteenth-century Quiché Maya manuscript that had been written out by Francisco Ximénez, a missionary of the time. Suppose, Tedlock asked, we have an ancient text, one that was meant to have been narrated. Can we narrate it today as performers would have done in ancient times? In achieving his translation of the *Popol Vuh*, Tedlock had relied on Andrés Xiloj, a modern speaker of Quiché. Xiloj had not been trained to read Maya, but he was literate in Spanish and made the transition very quickly. “When given his first chance to look at the *Popol Vuh* text, he produced a pair of spectacles and began reading aloud, word by word” (Tedlock 1987:145).

As was true of many medieval manuscripts in Europe, Ximénez’s rendition of the *Popol Vuh* was more or less an undifferentiated mass of text with almost no punctuation—that is, no clues on how a performer might have “emphasized or elided the boundaries of . . . segments of discourse through the use of intonational contours, or how he might have varied his timing through the placement of pauses” (Tedlock 1987:147).

The solution to this problem was to capture oral narratives (not just casual speech) from modern speakers of the language—speeches, prayers, songs, stories—and to look for “patterns in the wording that have analogs in the ancient text” and how these patterns are enunciated (Tedlock 1987:147). Tedlock devises conventions for marking pauses, accelerations, verse endings, and so on. It is in the very use of such written marks that we see Tedlock’s analysis—that is, his understanding of how a performance went. He can apply the written conventions to ancient texts once the analysis of performance is done. Then, by using techniques from linguistics (such as systematic comparison to look for recurrent sound patterns that signify variations in

meaning), Tedlock found that Quiché verse has the same structure as ancient Middle Eastern texts—texts that predate Homer. Indeed, he concluded it is the same structure found in all living oral traditions that have not yet been influenced by writing. This is a contribution to a general theory of poetics and literature of the sort that Hymes had envisioned a decade earlier for the methods of ethno-poetics.

Sherzer (1994) presents a detailed analysis of a two-hour performance by Chief Olopinikwa of a traditional San Blas Kuna chant. The chant was recorded in 1970. Like many linguistic anthropologists, Sherzer had taught an assistant, Alberto Campos, to use a phonetic transcription system. After the chant, Sherzer asked Campos, to transcribe and translate the tape. Campos put Kuna and Spanish on left- and right-facing pages (1994:907).

By studying Campos's translation against the original Kuna, Sherzer was able to pick out certain recurrent features. Campos left out the chanted utterances of the responding chief (usually something like "so it is"), which turned out to be markers for verse endings in the chant. Campos also left out so-called framing words and phrases (like "Thus" at the beginning of a verse and "it is said, so I pronounce" at the end of a verse). These contribute to the line and verse structure of the chant. Finally, "instead of transposing metaphors and other figurative and allusive language into Spanish" Campos "explains them in his translation" (Sherzer 1994:908).

A key method of text analysis in ethno-poetics is text presentation. It turns out that verse breaks are determined by the regular turn-taking between Chief Olopinikwa and the responding chief and that verses and lines have a regular melodic shape. In his presentation of Chief Olopinikwa's performance, Sherzer breaks the work into lines and verses, using the convention of beginning verses and lines flush on the left of each page and indenting the lines of the responding chief. Earlier, in his presentation of *The Hot Pepper Story*, Sherzer (1990:178) used a highly literal translation. The text repeats a small number of words and themes, and Sherzer felt that a more liberal translation would fail to capture the poetics of performance. So, Sherzer describes the thematic elements he sees in the text but uses the device of literalness in the translation to draw the reader's attention to those elements.

Text analysis produces new text, which in turn can be analyzed. Hanks (1988) reviewed Edmunson's (1982) translation of *The Book of Chilam Balam of Tizimin*. Edmunson had translated and annotated the original Mayan corpus into 5,514 lines of text, changing the format of presentation in the process. In the original, the lines had run clear across the page, but Edmonson presented the text in short lines to emphasize what he considered to be the verse structure. Hanks analyzes not only the Mayan text, but the literary style that Edmonson used in his presentation.

In translating Ñähñu (Otomí) parables, folk tales, and jokes, Bernard and Salinas (1976) presented a fully literal translation and a fully liberal translation, in addition to a transcription of the Ñähñu. At the time, Bernard felt that there was no way to mediate between the characteristics of the original, free Ñähñu and a free English translation. Later, in translating Salinas's four-volume ethnography of the Ñähñu, Bernard tried a middle course—one in which the English is grammatical but also one

which makes clear from the style that it is a translation (see Bernard and Salinas 1989).

Anthropologists are still experimenting with methods for presenting text of indigenous performance that capture the subtleties of performance. How can one know if a particular presentation does, in fact, capture regular features of narrative? Tedlock's work with Andrés Xiloj, Sherzer's with Alberto Campos, and Bernard's with Jesús Salinas are, we think, experiments in method.

Sherzer and Woodbury (1987) observed that highly artistic, creative performance may be based on an underlying cognitive representation. These representations are knowable, they said, by systematically comparing texts across performances. Thus, they pose the possibility that there are schemas for performance—schemas that go beyond the lexical and syntactic levels of grammar. We will return to the methods of schema analysis.

### Inter- and Intracultural Comparisons of Narratives

Comparing how people produce narratives in different cultures has long been of interest to many social scientists. In 1975, Wallace Chafe and five colleagues received a grant from the National Institutes for Mental Health to conduct research on how people store knowledge in the mind. In the spirit of the pioneering work by F. C. Bartlett (1967 [1932]) on how people remembered and retold folk tales, Chafe and his colleagues hired a professional filmmaker and produced the *Pear Story* film.<sup>4</sup> They showed it to more than 50 speakers of English in California, and to 20 or more speakers of Chinese, Japanese, Malay, Greek, Thai, German, Haitian Creole, Persian, and Sapultec (a Mayan language in Guatemala). They asked their informants for narratives about the film within half an hour of viewing and transcribed the tapes verbatim (with lots of attention to pauses, pause filters, stutterings, and such).

Examining the *Pear Stories*, Chafe (1980) identified the existence of *idea units* (about six seconds long and containing about six words) commonly marked by an intonation contour that involves a rise in pitch or a fall. Chafe suggests “that these idea units, these spurts of language, are linguistic expressions of focuses of consciousness” (1980:15) that are packaged into sentences. Children often package entire narratives into a single unit, but so do adults sometimes.

Downing (1980) compared the 20 English and 20 Japanese *Pear* story narratives, marking all nominal references to concrete entities (1,363 in the English narratives; 786 in the Japanese). She found that speakers of both languages make extensive use of a similar body of “basic” lexemes, but that cognitive, stylistic, and textual constraints may cause individual speakers to substitute other words and phrases for the basic terms at a given point in the narrative.

Herzfeld (1977) analyzed multiple renditions of the *khelidonisma*, or swallow song, sung in modern Greece as part of the welcoming of spring. He collected texts of the song from ancient, medieval, and modern historical sources and recorded texts

of current-day renditions in several locations across Greece. His purpose was to show that inconsistencies in the texts come not from “some putative irrationality in the processes of oral tradition” but are, in fact, reflections of structural principles that underlie the *rite de passage* for welcoming spring in rural Greece. To make his point, Herzfeld looks for anomalies across renditions—like “March, my good March” in one song compared to “March, terrible March” in another. Herzfeld claims that the word “good” is used ironically in Greek where the referent is a source of anxiety.

Is March a subject of symbolic anxiety for Greek villagers? Yes, says, Herzfeld, it is, as evidenced by widely observed practices such as avoidance of certain activities during the *drimata* (the first three days of March). Herzfeld supports his analysis by referring to the *drimes*, a word that denotes the first three days of August, which are associated with malevolent spirits. Since March is the transition from winter to summer and August is the transition from summer to winter, Herzfeld concludes that there is symbolic danger associated with these mediating months. He finds support for this analysis in the fact that February is never referred to with an unequivocally good epithet.

This is symbolic analysis—the search for symbols and their interconnection in the expression of culture. The method for doing this kind of analysis requires deep involvement with the culture, including an intimate familiarity with the language, so that the symbolic referents emerge during the study of those expressions—as in the study of texts here. You can’t see the connections among symbols if you don’t know what the symbols are and what they are supposed to mean.

Furbee (1996) is doing an ongoing study of a new cult in and around Lomantán, a Tojolabal Maya village in the state of Chiapas, Mexico. According to the local story, Dominga Hernández was cutting wood on April 30, 1994, when God appeared and gave her images to care for. The images included the Christ Child, the Virgin Mary, Saint Joseph, and animals of the crèche. Hernández was to keep the images in her house and have a church built in Lomantán. Then she could turn over care of the the images to the community. Within 43 days, Hernández had mobilized support for purchase of materials and for the donated labor that went into building the church that now houses the images.

In 1996, Furbee and Jill Brody collected 26 versions of the Lomantán miracle. The tellers of these stories come from eighteen different villages across the region, including ten that are loyal to the PDR (an opposition party) and eight that are loyal to the PRI (the ruling political party).

Spanish loan words in the texts run from 1.9%–12.5% (the high end is the tale told by Hernández herself), but the number of Spanish loan words in the texts from the PRI-affiliated villages is 22% greater than the number of loan words in the texts from the PDR-affiliated villages (the difference is statistically significant). In other words “the greater Spanish loan usage is where one would expect to find it, with people from villages sympathetic to prevailing power.” The PDR-affiliated villages are more sympathetic to the Zapatista cause and the speech of those villages contains fewer Spanish loan words—“just what one might predict from those who oppose the



prevailing hegemony and who are engaged in a revitalization movement” (Furbee 1996:13).

*La Llorona* (the weeping woman) is a morality tale told across Mexico. Mathews (1992) collected 60 tellings of it. Here is one telling, which Mathews says is typical:

La Llorona was a bad woman who married a good man. They had children and all was well. Then one day she went crazy and began to walk the streets. Everyone knew but her husband. When he found out he beat her. She had much shame. The next day she walked into the river and drowned herself. And now she knows no rest and must forever wander the streets wailing in the night. And that is why women must never leave their families to walk the streets looking for men. If they are not careful they will end up like La Llorona. (1992:128)

In another telling, La Llorona kills herself because her husband becomes a drunk and loses all their money. In yet another, she kills herself because her husband is seen going with other women and La Llorona, in disbelief, finally catches him paying off a woman in the streets.

Borrowing from Mandler’s (1984) notion that stories are composed of an ordered series of constituent units, Mathews builds a grammar of the La Llorona stories. It is this grammar, says Mathews, this schema, that accounts for the success of the tale’s motivational force. The morality tale succeeds in shaping people’s behavior because “the motives of the main characters draw upon culturally shared schemas about gendered human nature” (1992:129). Men, according to Mathews’s understanding of the cultural model in rural mestizo Oaxaca, view women as sexually uncontrolled. Unless they are controlled, or control themselves, their true nature will emerge and they will begin (as the story says) to “walk the streets” in search of sexual gratification. Men, for their part, are viewed by women as sexually insatiable. Men are driven, like animals, to satisfy their desires, even at the expense of family obligations. In her grammar of La Llorona tales, Mathews shows that women have no recourse but to kill themselves when they cannot make their marriages work.

Mathews, however, goes beyond simply identifying the schema; she offers an explanation of where key parts of the schema come from. Most marriages in the village where Mathews did her research are arranged by parents and involve some exchange of resources between the families. Consequently, “natal families are usually unwilling to take back a daughter permanently and thereby contribute to the break-up of a marriage. So the only option perceived to be open to a woman who wants to terminate her marriage is suicide” (1992:150). Thus, Mathews offers a materialist explanation of how structural features in the society effect superstructural outcomes (perceptions) and consequent behavior—the inclusion of suicide by the woman in virtually all tellings of the La Llorona morality tale, despite significant variations in the tellings by men and women.

We now turn to the sociological analysis of text, beginning with the search for schemas.

### Schemas, Models, and Metaphors

Schema analysis combines elements of the linguistic and sociological traditions. It pays particular attention to linguistic and paralinguistic features such as metaphors, proverbs, repetitions, pauses, speaker transitions, turn taking, and interruptions in the search for mental models that motivate action (D'Andrade 1984, 1987, 1995). (For a review of the concept of mental models, see Johnson-Laird [1983, 1989].)

Schema analysis is based on the idea that there is too much information about reality for people to deal with and that people must carry around some simplifications that help make sense of the welter of information to which they are exposed (Casson 1983:430). Early work by Bartlett (1967 [1932]) on how people remember things suggested the existence of such simplifications or "building blocks of cognition" (Rumelhart 1980).

In an influential book, Schank and Abelson (1977) postulated that schemas—or scripts, as they called them—enable culturally skilled people to fill in details of a story. We often say things like "Fred lost his data because he forgot to save his work." We know that Fred's forgetting to save his work did not actually *cause* him to lose his data. A whole set of links are left out, but they are easily filled in by any listeners who have the background to do so. It is, says Wodak (1992:525), our schemas that lead us to interpret Mona Lisa's smile as evidence of her perplexity or of her desperation.

Some schemas may be universal. Piaget (1970) studied cognitive schemas in children that he thought were universal in human development. Some are surely idiosyncratic (each person speaks a language that is, in some ways, like no other). Somewhere between universal and idiosyncratic schemas are *cultural schemas*: They are developed through experience but are held by a population (Rice 1980:154; D'Andrade 1995:130).

Rice (1980) developed what she called the American schema for telling a story, which she contrasted with the Eskimo schema for doing the same thing. Using an experimental design, she took two Eskimo stories, adjusted them to about 20 phrases each, and presented one of five, systematically distorted versions to 12 Americans. She also presented the complete, original Eskimo story (in English) or an Americanized version of the story to 12 people. Then she asked informants to recall and write down, in their own words, certain passages from the stories.

When the passages fit the American story schema (as they did in the Americanized versions of the stories), subjects agreed about which events they remembered. Furthermore, subjects recalled vastly more exactly worded phrases from the Americanized versions of the stories than from the Eskimo ones. Thus, people distort stories in recall to fit their cultural expectations (their schemas) about what stories ought to be like.

Cognitive scientists, including anthropologists like Rice, often study schemas by setting up experiments so that they can observe the act of reasoning under uncomplicated conditions. Hutchins takes a naturalist's perspective. "If what we want to

know about is how people reason in the real world,” he says, “let’s look at them doing that” (1980:123). Hutchins (1980) recorded and transcribed a formal dispute in the Trobriands. Two men claim the right to cultivate a particular garden plot. The antagonists have different views of the facts but, as Hutchins shows, they share an underlying logic—a schema—for how land claims are to be understood (1980:128).

Of course, it is not always possible to record people who are reasoning about important issues in their lives. The intermediate step, between experiments on reasoning and recording natural discourse on reasoning, is to collect texts. In 1979, Naomi Quinn and her students collected and transcribed interviews about marriage from 11 North American couples. Some of the couples were recently married; others had been married a long time. The couples came from different parts of the country and represented various occupations, educational levels, and ethnic and religious groups. Each of the 22 people were interviewed separately for 15–16 hours, and the interviews were transcribed.

In a series of articles, Quinn (1982, 1987, 1992, 1996, 1997) has analyzed this body of text to discover and document the concepts underlying American marriage and to show how these concepts are tied together—how they form a cultural model shared by people from different backgrounds about what constitutes success and failure in marriage.

Quinn’s method is to “exploit clues in ordinary discourse for what they tell us about shared cognition—to glean what people must have in mind in order to say the things they do” (1997:140). She begins by looking at patterns of speech and the repetition of key words and phrases, paying particular attention to informants’ use of metaphors and the commonalities in their reasoning about marriage. For example, Nan, one of her informants, uses a popular metaphor, that “marriage is a manufactured product”—something that has properties, like strength and staying power, and that requires work to produce. Some marriages are “put together well,” while others “fall apart” like so many cars or toys or washing machines (Quinn 1987:174).

Quinn’s emphasis on metaphor owes much to the pioneering work by Lakoff and Johnson (1980). The object is to look for metaphors in rhetoric and deduce the schemas, or underlying principles, that might produce patterns in those metaphors. For instance, Quinn found that people talk about their surprise at the breakup of a marriage by saying that they thought the couple’s marriage was “like the Rock of Gibraltar” or that they thought the marriage had been “nailed in cement.” People use these metaphors because they assume that their listeners know that cement and the Rock of Gibraltar are things that last forever.

But Quinn reasons that if schemas or scripts are what make it possible for people to fill in around the bare bones of a metaphor, then the metaphors must be surface phenomena and cannot themselves be the basis for shared understanding. Quinn found that the hundreds of metaphors in her corpus of texts fit into just eight linked classes that she calls: lastingness, sharedness, compatibility, mutual benefit, difficulty, effort, success (or failure), and risk of failure. For example, Quinn’s

informants often compared marriages (their own and those of others) to manufactured and durable products (“it was put together pretty good”) and to journeys (“we made it up as we went along; it was a sort of do-it-yourself project”). Quinn sees these metaphors, as well as references to marriage as “a lifetime proposition,” as exemplars of the overall expectation of lastingness in marriage.

The classes of metaphors, the underlying concepts, are linked together in a schema that guides the discourse of ordinary Americans about marriage:

Marriages are ideally lasting, shared and mutually beneficial. Marriages that are not shared will not be mutually beneficial and those not mutually beneficial will not last. Benefit is a matter of fulfillment. Spouses must be compatible in order to be able to fill each other's [emotional] needs so that their marriages will be fulfilling and hence beneficial. Fulfillment and, more specifically, the compatibility it requires, are difficult to realize but this difficulty can be overcome, and compatibility and fulfillment achieved, with effort. Lasting marriages in which difficulty has been overcome by effort are regarded as successful ones. Incompatibility, lack of benefit, and the resulting marital difficulty, if not overcome, put a marriage at risk of failure. (Quinn 1997:164)

Quinn presents extended excerpts from eight informants to illustrate the relationship between lastingness and success. She hopes that the examples she gives will familiarize readers with her mode of analysis and “convince them of the pattern exemplified” in the cases she presents. “Finding this structure,” Quinn says, “was a methodological challenge” (1997:167).

Other examples of the search for cultural schemas in texts include Holland's (1985) study of the reasoning that Americans apply to interpersonal problems, Kempton's (1987) study of ordinary Americans' theories of home heat control, and Claudia Strauss's (1997) study of what chemical plant workers and their neighbors think about the free enterprise system.

Examining metaphors and proverbs are not the only linguistic features used to infer meaning from text. D'Andrade notes that “perhaps the simplest and most direct indication of schematic organization in naturalistic discourse is the repetition of associative linkages” (1991:294). He observes that “indeed, anyone who has listened to long stretches of talk—whether generated by a friend, spouse, workmate, informant, or patient—knows how frequently people circle through the same network of ideas” (1991:287).

In a study of blue-collar workers in Rhode Island, Claudia Strauss (1992) refers to these ideas as “personal semantic networks.” She describes such a network from one of her informants. On rereading her intensive interviews with one of the workers, Strauss found that her informant repeatedly referred to ideas associated with greed, money, businessmen, siblings, and “being different.” She displays the relationships among these ideas by writing the concepts on a page of paper and interconnected with lines and explanations.

Price (1987) observes that when people tell stories, they assume that their listeners share many assumptions about how the world works and so they leave out

information that “everyone knows.” Thus, in her study of 14 narratives of illness and misfortune in a Mestizo community in Ecuador, Price looks for what is *not* said in order to identify underlying cultural assumptions (1987:314).

If underlying schemas exist, then, with a native speaker’s command of the language and a deep understanding of one another’s metaphors (about marriage and so many other things), we can recognize the surface representations of those schemas. Understanding the complete lexicon of a language, then, makes it possible to do text analysis. Language competence is nine-tenths of method.

We turn next to the two methods most widely used across the social sciences for analyzing text: grounded theory and classical content analysis. Grounded theory emphasizes the discovery and labeling of concepts (variables) and the building of models based on a close reading of the text. Classic content analysis emphasizes the formal description of concepts and the testing of models and hypotheses.

### Grounded Theory

Grounded theory is a set of techniques that: (1) brings the researcher close to informants’ experiences; (2) provides a rigorous and detailed method for identifying categories and concepts that emerge from text; and (3) helps the researcher link the concepts into substantive and formal theories (Glaser and Strauss 1967; Lincoln and Guba 1985; Strauss 1987; Lonkila 1995; Charmaz 1990; Strauss and Corbin 1990; Wilson and Hutchinson 1996). Miles and Huberman (1994) refer to their own brand of text analysis as “soft-nosed positivism”—a good characterization of most work in grounded theory as well, in our view.

Grounded theory has been used to examine topics in public health (Hitchcock and Wilson 1992; Sohler 1993; Kearney et al. 1994, 1995; Irurita 1996; Wright 1997), social welfare (Silverberg et al. 1996), and business (Hunt and Ropo 1995; Locke 1996). It also has a long history in ethnographic case studies (Becker et al. 1961; Agar 1979, 1980, 1983). Journals such as *Nursing Research*, *Qualitative Health Research*, and *Qualitative Sociology* have been outlets for this type of research.

The mechanics of grounded theory are deceptively simple: produce verbatim transcripts of interviews and read through a small sample of text (usually line by line). Identify potential themes that arise. As analytic categories emerge, pull all the data (that is, exemplars) from those categories together and compare them, considering not only what text belongs in each emerging category but also how the categories are linked together. Use the relationships among categories to build theoretical models, constantly checking the models against the data—particularly against negative cases. Throughout the process, keep running notes about the coding and about potential hypotheses and new directions for the research. This is called “memoing” in the vocabulary of grounded theory. Grounded theory is an iterative process by which the analyst becomes more and more “grounded” in the data and develops increasingly richer concepts and models of how the phenomenon being studied really works.

### *Identifying Themes*

Many researchers offer specific advice and schemes for inductive or “open” coding of text (Taylor and Bogdan 1984; Lincoln and Guba 1985; Strauss and Corbin 1990; Bogdan and Biklen 1992; Bernard 1994; Lofland and Lofland 1995; Agar 1996). Sandelowski (1995a:373) observes that analysis of texts begins with proofreading the material and simply underlining key phrases “because they make some as yet inchoate sense.” Identifying the categories and terms used by informants themselves is called “*in vivo* coding” (Strauss and Corbin 1990). Spradley (1979:199–201) advised searching texts for evidence of social conflict, cultural contradictions, informal techniques of social control, methods that people use in managing impersonal social relationships, the methods by which people acquire and maintain achieved and ascribed status, and information about how people solve problems. Each of these arenas, he said, is likely to yield major themes in cultures.

Others suggest that coders start with some general themes derived from reading the literature and add more themes and subthemes as they go (Willms et al. 1990; Miles and Huberman 1994). Regardless of which strategy is used, by the time one identifies the themes and refines them to the point where they can be applied to the whole text, a lot of the interpretive analysis has been done. Miles and Huberman say simply: “Coding is analysis” (1994:56).

### *Building Models*

The next step is to identify how themes are linked to each other in a theoretical model. Memoing is one of the principal techniques for recording relationships among themes. When reviewing the text, you continually write down your thoughts about what you’re reading. These thoughts become a set of information on which to develop theory. We think of memoing as taking field notes on observations about texts.

Strauss and Corbin discuss three kinds of memos: code notes, theory notes, and operational notes (1990:18, 73–74, 109–129, 197–219). Code notes describe the concepts that are being discovered in “the discovery of grounded theory.” In theory notes, the researcher tries to summarize his or her ideas about what’s going on in the text. Operational notes are about practical matters.

Once a model starts to take shape, researchers specifically look for negative examples that do not fit the pattern. Negative case analysis is discussed in detail by Becker et al. (1961:37–45), Strauss and Corbin (1990:108–109), Lincoln and Guba (1985:309–313), Dey (1993:226–233), and Miles and Huberman (1994:271). Negative cases either disconfirm parts of the model or suggest new connections that need to be made. In either case, these negative examples need to be accommodated when results are presented.

When the steps of the grounded theory approach are followed, models or “theories” are produced that are, indeed, “grounded” in the text. These models, however, are not the final product of the grounded theory approach. In their

original formulation, Glaser and Strauss (1967) emphasized that the building of grounded theory models is a step in the research process. The next, of course, is to confirm the validity of a model by testing it on an independent sample of data.

The grounded theory approach, including iterative coding and analysis by constant memoing, has been the inspiration for several of the most widely used software packages in text analysis, including Atlas/ti (Muhr 1991), NUD\*IST (Richards and Richards 1991), and Kwalitan (Peters and West 1990). In fact, 17 of the 24 text analysis packages reviewed by Weitzman and Miles (1995:316–325) have some provision for writing memos on the fly and retrieving them during analysis.<sup>5</sup>

### *Displaying Concepts and Models*

Much of grounded theory involves presenting segments of text—verbatim quotes from informants—as exemplars of concepts and theories. These illustrations may be prototypical examples of central tendency or they may represent exceptions to the norm. Grounded theory researchers may display their theoretical results in maps of the major categories and the relationships among them (Miles and Huberman 1994:134–137, Kearney et al. 1995). These “concept maps” are similar to the personal semantic networks described by C. Strauss (1992) and D’Andrade (1991) (see below).

### *An Example of Grounded Theory*

Kearney et al. (1995) interviewed 60 women who reported using crack cocaine an average of at least once weekly during pregnancy. The semistructured interviews lasted from one–three hours and covered childhood, relationships, life context, previous pregnancies, and actions during the current pregnancy related to drug use, prenatal care, and self-care. Transcripts were coded and analyzed as soon as they became available so that data collection and data analysis were intricately linked. As new topics emerged, investigators asked about the topics in subsequent interviews.

Kearney et al. coded the data first for the general topics they used to guide the interviews. Later, they would use these codes to search for and retrieve examples of text related to various interview topics. Next, team members reread each transcript searching for examples of social psychological themes in the women’s narratives. Each time they found an example, they considered “What is this an example of?”. The answers suggested substantive categories that were refined with each new transcript.

Kearney et al. (1995) looked at how substantive categories were related. They recorded their ideas about these interactions in the forms of memos and developed a preliminary model. With each subsequent transcript, they looked for negative cases and pieces of data that challenged their emerging model. They adjusted the model to include the full range of variation that emerged in the transcripts.

To begin with, Kearney et al. identified five major categories, which they called: VALUE, HOPE, RISK, HARM REDUCTION, and STIGMA MAN-

AGEMENT. (Capital letters are often for code names in grounded theory research, just as in statistical research.) Women valued their pregnancy and the baby-to-be in relation to their own life priorities (VALUE); women expressed varying degrees of hope that their pregnancies would end well and that they could be good mothers (HOPE) and they were aware that cocaine use posed risks to their fetus but they perceived that risk differently (RISK). Women tried in various ways to minimize the risk to the fetus (HARM REDUCTION) and they used various stratagems to reduce social rejection and derision (STIGMA MANAGEMENT).

By the time they had coded 20 interviews, Kearney et al. realized that the categories HARM REDUCTION and STIGMA MANAGEMENT were components of a more fundamental category that they labeled EVADING HARM. After about 30 interviews had been coded, they identified and labeled an overarching psychological process they called SALVAGING SELF that incorporated all five of the major categories. "Theoretical saturation" was reached at approximately 40 interviews and Kearney et al. conducted another 20 without discovering any new categories or relationships.

Kearney et al. (1995) present their model graphically with ties to supporting textual evidence. They describe in rich detail each of the major categories that they discovered. Finally, they checked the validity of their model by presenting it to knowledgeable informants (pregnant drug users), members of the project staff, and health and social service professionals who were familiar with the population under study.

### Classical Content Analysis

While grounded theory is concerned with the discovery of data-induced hypotheses, content analysis comprises techniques for (1) reducing the symbol-laden artifacts produced by human behavior (including, but not limited to texts) to a unit-by-variable matrix and (2) analyzing that matrix quantitatively in order to test hypotheses. The matrix is produced by applying a set of codes to artifacts and checking the reliability of human coders against one another. When the artifacts are texts, the coding may be done by a computer, using a content analysis dictionary. In addition to written text, the symbol-laden artifacts of human effort include television sit-coms, political cartoons, advertisements, song lyrics, and clay pots. The object is to test hypotheses about the producers of the symbolic artifacts, the consumers, or both.<sup>6</sup>

Cowan and O'Brien (1990), for example, tested whether males or females were more likely to be survivors in slasher films. The corpus of "text" in this case was 56 slasher films. The films contained a total of 474 victims, who were coded for gender and survival. Conventional wisdom about slasher films holds that victims are mostly women and slashers are mostly men. While slashers in these films were, in fact, mostly men, it turned out that victims were equally likely to be male or female. Surviving as a female slasher victim, however, was strongly associated with the absence of sexual behavior and with being less physically attractive than



nonsurviving females. The male nonsurvivors were cynical, egotistical, and dictatorial. Cowan and O'Brien conclude that, in slasher films, sexually pure women survive and that "unmitigated masculinity" ends in death (1990:195).

The methodological issues associated with content analysis are all evident here. Does the sample of 56 films used by Cowan and O'Brien justify generalizing to slasher films in general? Did the coders who worked on the project make correct judgments in deciding things like the physical attractiveness of female victims or the personality and behavioral characteristics of the male victims? These two issues in particular, sampling and coding, are at the heart of content analysis.

### *Sampling*

There are two components to sampling. The first is the identification of the *corpus* of texts; the second is the identification of the units of analysis *within* the texts. If one collects 40 or 50 life histories, then the entire set of texts is analyzed. When the units of data run into the hundreds or even thousands (i.e., all television commercials that ran during prime time in August 1997, all front-page stories of *The New York Times* from 1887–1996, all campaign speeches by Bill Clinton and George Bush during the 1996 presidential campaign), then a representative sample of records must be made.

Gilly (1988) did a cross-cultural study of gender roles in advertising. She videotaped a sample of 12 hours of programming in Los Angeles (U.S.), Monterrey (Mexico), and Brisbane (Australia), from 8 a.m. to 4 p.m. on Tuesday and 7 p.m. to 11 p.m. on Wednesday. To control for seasonal variation between the hemispheres, the U.S. and Mexico samples were taken in September 1984, while the Australia sample was taken in February 1985. There were 617 commercials: 275 from the U.S., 204 from Mexico, and 138 from Australia. Because of her research question, Gilly used only adult men and women who were on camera for at least three seconds or who had at least one line of dialogue. There were 169 women and 132 men in the U.S. ads; 120 women and 102 men in the Mexican ads; and 52 women and 49 men in the Australian ads.

Cohen (1990) wanted to know whether the unpredictability of the environment (floods, drought, etc.) would be reflected in a society's folktales. He selected a sample of 19 societies using two criteria: (1) two independent coders had to agree on the presence of three variables about resources in a cross-cultural study of warfare done by Ember and Ember (1992); and (2) there had to be at least 9 folktales for each society in the Human Relations Area Files (as of 1988). Cohen then selected up to 10 folktales from each society. If there were more than that, he numbered them and selected them randomly. In all, Cohen had 187 different folktales to code and analyze.

Waitzkin and Britt (1993:1121) did an interpretive analysis of 50 encounters between patients and doctors by randomly selecting texts from 336 audiotaped encounters. Nonquantitative text analysis is often based on purposive sampling. Trost (1986) thought the relationship between teenagers and their families might be

affected by five different dichotomous variables. To test this idea, he intentionally selected five cases from each of the 32 possible combinations of the five variables and conducted 160 interviews.

Nonquantitative studies in content analysis may also be based on extreme or deviant cases, cases that illustrate maximum variety on variables, cases that are somehow typical of a phenomenon, or cases that confirm or disconfirm a hypothesis. A single case may be sufficient to display something of substantive importance, but Morse (1994) suggests using at least six participants in studies in which one is trying to understand the essence of experience. Morse also suggests 30–50 interviews for ethnographies and grounded theory studies. Patton (1990: 169–186) and Sandelowski (1995b) provide useful reviews of the nonrandom strategies for sampling texts. Finding themes and building theory may require fewer cases than comparing across groups and testing hypotheses or models.

Once a sample of texts is established, the next step (called “unitizing” [Krippendorff 1980] or “segmenting” [Tesch 1990]) is to identify the basic, nonoverlapping units of analysis. The units may be the entire texts (books, interviews, responses to an open-ended question on a survey) or segments (words, word-senses, sentences, themes, paragraphs). Where the object is to compare across texts—to see *whether or not* certain themes occur—the whole text (representing an informant or an organization) is the appropriate unit of analysis. When the object is to compare the *number of times a theme occurs* across a set of texts, then what Kortendick (1996) calls a *context unit*—a chunk of text that reflects a theme—is likely to be the appropriate unit of analysis.

With a set of texts in hand, the next steps are to develop a codebook and mark (actually code) the text. This is the heart and soul of sociological text analysis, whether it is schema analysis, grounded theory, or classic content analysis. How to develop a codebook is covered in detail by Dey (1993:95–151), Crabtree and Miller (1992), Miles and Huberman (1994:55–72). Richards and Richards (1991) discuss the theoretical principles related to hierarchical coding structures that emerge out of the data. Araujo (1995) uses an example from his own research on the traditional British manufacturing industry to describe the process of designing and refining hierarchical codes. The development and refinement of coding categories has long been a central task in classical content analysis (for example, Bereleson 1952: 147–168; Holsti 1969:95–126) and is particularly important in the construction of concept dictionaries (Stone et al. 1966:134–168; Deese 1969). Krippendorff (1980: 71–84) and Carey et al. (1996) note that much of codebook refinement comes during the training of coders to mark the text and in the act of checking for intercoder agreement.

The word “code” has two quite different meanings. Codes are sometimes simply tags that mark off sections of text in a corpus and sometimes are values of a variable. When codes are used as tags, they are reference markers, like an index in the back of a book. When they are used as values of a variable, they identify nominal, ordinal, or even ratio characteristics of episodes, cases or persons (Bernard 1991, 1994:193–194; Seidel and Kelle 1995). Below we look more closely at these distinctions.

### Inductive Coding

In hypothesis-testing content analysis, codes are typically formulated first and the codebook is then tested for reliability, using multiple coders and modified if necessary. In exploratory content analysis, inductive coding (*open coding* in grounded theory terms) is appropriate. Kortendick (1996), for example, interviewed 43 members of a three-generation extended family in Holland, all of whom were related to three sisters (the first generation) who had immigrated from Indonesia. Some of the interviews were done with individuals, others with groups of several people. After reading eight interviews carefully, Kortendick found that he was no longer identifying any new themes and he constructed a codebook.

Kortendick used a numerical coding scheme. (Miles and Huberman [1994:65] warn against this, but it's really a matter of taste—whatever works for individual researchers.) Kortendick applied his coding scheme to all the interview texts, tagging each text for things like the level of competence in Dutch versus Indonesian that people evinced, whether they mentioned any of 21 family myths that he had identified, and whether each person felt fully Dutch, fully Indonesian, or ambivalent about their identity. Kortendick built a matrix of informants-by-themes so he could count and compare references to these myths across all 43 informants.

Ryan and Weisner (1996) asked fathers and mothers to describe their adolescent children. Ryan and Weisner generated a list of the unique words in the corpus and the number of times each word was used. They used the list to look for differences between fathers and mothers and to look for themes that might be coded in a content analysis. Mothers, for example, were more likely to use words like *friends*, *creative*, *time*, and *honest*; fathers were more likely to use words like *school*, *good*, *lack*, *student*, *enjoys*, *independent*, and *extremely*.

### Deductive Coding

Deductive coding is appropriate in confirmatory research. From her reading of literature on the theory of resources, Hirschman (1987) thought that she would find ten kinds of resources in personal ads: love, physical characteristics, educational status, intellectual status, occupational status, entertainment services (nonsexual), money status, demographic information (age, marital status, residence), ethnic characteristics, and personality info (not including sexual or emotional characteristics). Hirschman formulated and tested hypotheses about which resources men and women would offer and seek in personal ads.

She selected 20 test ads at random from the *New York Magazine* and *The Washingtonian* and checked that the ten kinds of resources were, in fact, observable in the ads. Sexual traits and services were less than 1% of all resources coded. This was 1983–84, but even then, ads with explicit references to sexual traits and services were more common in other periodicals than in *The Washingtonian* and *New York Magazine*.

Hirschman next gave 10 men and 11 women the list of resource categories and a

list of 100 actual resources (“young,” “attractive,” “fun loving,” “divorced,” “32-year-old,” etc.) gleaned from the 20 test ads. The respondents were asked to match the 100 resources with the resource category that seemed most appropriate. This exercise demonstrated that the resource items were mutually exclusive and exhaustive: No resource items were left over and all could be categorized into just one of the ten resource categories.

When she was confident her codebook worked, Hirschman tested her hypotheses. She sampled approximately 100 female-placed ads and 100 male-placed ads from each magazine. A male and a female coder, working independently (and unaware of the hypotheses of the study) coded 3,782 resource items taken from the 400 ads as belonging to one of the ten resource categories. The coding took three weeks. This is not easy work.

A third coder was given the data and identified discrepancies between the first two coders. Of 3,782 resource items coded, there were theme contrasts on 636 (16.8%) and one of the coders failed to code 480 items (12.7%). The theme contrasts were resolved by Hirschman. The omissions were checked against the ads to see if, in fact, the one coder who had made an assignment had done so because the resource was in the ad. This was always the case, so the 480 resource items omitted by one coder were counted as if they had been assigned to the ad by both coders.

Hirschman found that men were more likely than women to offer monetary resources, whereas women were more likely than men to seek monetary resources. Women were more likely than men to offer physical attractiveness. It would be very interesting to repeat this study today with the same magazines. After all, Washington, DC and New York City are supposed to be hip places. Are the stereotypes of how men and women market themselves to one another today very different from what they were in 1983–84?

Confirmatory hypothesis testing and deductive coding are also used by anthropologists and other scholars who examine the Human Relations Area Files. The “codes” in the *Outline of Cultural Materials* are tags, however, not measurements. “Tagging” a paragraph in a text on the Yanomamo with “warfare” indicates textual material on the topic. It says nothing about how much the Yanomamo engage in warfare, or how intense their battles are, or whether Yanomamo men are at high or low risk of dying in battle. These kinds of measurements require a close reading of the segments of text that deal with warfare. Absent any prior knowledge about the Yanomamo, the tag “warfare” could just as well indicate that the Yanomamo are a peaceful people who despise and preach actively against violence. [Methodological issues associated with cross-cultural research are dealt with at length in Chapter 17 of this volume. *Ed.*]

### *Intercoder Agreement*

The marking of text often involves multiple coders. The idea is to see whether the constructs being investigated are shared and whether multiple coders see the same

constructs as applying to the same chunks of text. Carey et al. (1996) asked 51 newly arrived Vietnamese refugees in New York State 32 open-ended questions about tuberculosis. Topics included knowledge and beliefs about TB symptoms and causes, as well as beliefs about susceptibility to the disease, prognosis for those who contract the disease, skin testing procedures, and prevention and treatment methods. The investigators read the responses and created a code list based simply on their judgment. The initial code book contained 171 codes.

Next, the researchers broke the text into 1,632 segments (each segment representing a single informant's response to each of the 32 questions) and two coders independently coded 320 segments. Text segments could be marked with multiple codes. Segments were counted as reliably coded if both coders used the same codes on it. If one coder left off a code or assigned an additional code, then this was considered a coding disagreement. On their first try, only 144 (45%) out of 320 responses were coded the same by both coders. The coders discussed their disagreements and found that some of the 171 codes were redundant, some were vaguely defined, and some were not mutually exclusive. In some cases, coders simply had different understandings of what a code meant. When these problems were resolved, a new, streamlined codebook was issued and the coders marked up the data again. This time they were in agreement 88.1% of the time.

This seems like high reliability, but analysts typically apply a correction formula to take account of the fact that some fraction of agreement will always occur by chance. Cohen's *Kappa*, or *K* is a popular measure for taking these chances into account (Jacob Cohen 1960). When *K* is zero, agreement is what might be expected by chance.<sup>7</sup> When *K* is negative, the observed level of agreement is less than one expects by chance. Of the 152 codes in the new code list that had been applied to the 320 sample segments, the coders agreed perfectly (*kappa* = 1.0) for 82.9% of the codes. Only 17 (11.2%) of the codes had final *K* values  $\neq 0.89$ . As senior investigator, Carey resolved any remaining intercoder discrepancies himself (Carey et al. 1996).

How much intercoder agreement is enough? The standards are still evolving, but Krippendorff (1980:147–148) advocates agreement of at least .70 and notes that some scholars (Brouwer et al. [1969]) use a cutoff of .80. In developing software to create psychological scales from texts, Gottschalk and Bechtel (1993) ensured that the reliability of the computer scores were greater than .80 when compared to human coders. Including several measures of intercoder agreement in popular text analysis packages would encourage much needed research on this issue.<sup>8</sup>

### Dictionaries

Computer-based, general-purpose content analysis dictionaries are a kind of automated codebook. To build such dictionaries, words are assigned, by hand, to one or more categories (there are typically 60–50 categories in computerized content analysis dictionaries), according to a set of rules. The rules are part of a computer program that parses new texts, assigning words to categories.

Work began in the 1960s on the best-known system, the *General Inquirer* and continues to this day (Stone et al. 1966; Kelly and Stone 1975; Zuell et al. 1989). The system comprises a computer program (the *General Inquirer*), which uses a dictionary (the *Harvard Psychosocial Dictionary*) in parsing text and categorizing text. An early version of the system was tested on 66 suicide notes—33 written by men who had actually taken their own lives, and 33 written by men who were asked to produce simulated suicide notes. The control group men were matched with the men who had written actual suicide notes on age, occupation, religion, and ethnicity. The *General Inquirer* program parsed the texts and picked the actual suicide notes 91% of the time (Ogilvie et al. 1966).

The 1975 update of the *Harvard Psychosocial Dictionary*, called *Harvard IV*, initially contained about 4,000 entries (Kelly and Stone 1975:47), and the Dartmouth adaptation of *Harvard IV* now contains about 8,500 (Rosenberg et al. 1990). The next version will contain around 10,000 (Philip Stone, personal communication).<sup>9</sup> Unlike its predecessors, the *Harvard IV* dictionaries can distinguish among multiple meanings of many words. If the program runs into the word “broke,” for example, it looks at the context and determines whether the meaning is “fractured,” or “destitute,” or “stopped functioning,” or (when the word is paired with “out”) “escaped” (Rosenberg et al. 1990:303). Of course, dictionaries do not include all the words in a text, so investigators must still look at words that are not tagged and decide how to tag them independently.<sup>10</sup>

Content dictionaries do not need to be very big to be useful. In his study of Navaho and Zuni responses to thematic apperception tests, Colby's (1966) initial impression was that the Navajo regarded their homes as havens and places of relaxation, whereas the Zuni depicted their homes as places of discord and tension. To test this idea, Colby created a special-purpose dictionary that contained two word groups that he and his colleagues had developed before looking at the data.

One word group, the “relaxation” group, comprised the words *assist*, *comfort*, *easy*, *affection*, *happy*, and *play*. The other, the “tension” group, comprised the words *destruction*, *discomfort*, *difficult*, *dislike*, *sad*, *battle* and *anger*. Colby examined the 35 sentences that contained the word “home” and one of the words in either of the two word groups. The Navajos were more than twice as likely to use words from the relaxation group when they were talking about home as they were to use words from the tension group. The Zuni were almost twice as likely to use tension words as they were to use relaxation words.

Colby (1966) also found that the Navajo were more likely to use words associated with exposure such as storm, cold, freezing, hot, heat, and windy. Colby was not surprised at the results; he noted that the Navajo were sheep herders and were concerned about protecting their sheep from the elements, whereas the Zuni were crop growers and were concerned about the water they need to grow their corn. What was surprising was that the texts were generated from pictures that had nothing to do with sheep or crops. (See Jehn and Werner [1993] and Furbee [1996] for other examples of the application of a special-purpose content dictionary.)<sup>11</sup>

Content dictionaries are attractive because they are entirely reliable but, as Shapiro

(1997) argues, this may be offset by a decrease in validity. In many cases, only humans can parse the subtleties of meaning reflected in context (Viney 1983), but dictionary-based markup of text is producing better and better results as time goes on, particularly in well-defined domains. For example, texts are now scored by computer for the Gottschalk-Gleser psychological scales (measuring various forms of anxiety and hostility) with greater than .80 reliability (Gottschalk and Bechtel 1993).<sup>12</sup> We expect to see increasing use of computer-based dictionaries in text analysis.

For additional examples of special-purpose dictionaries in content analysis, see Fan and Shaffer (1990), Holsti (1966), Laffal (1990, 1995), McTavish and Pirro (1990), and Schnurr et al. (1986).

### Combining Grounded Theory and Content Analysis Approaches

Techniques from grounded theory and content analysis can be fruitfully combined. Jehn and Doucet (1996, 1997) asked 76 U.S. managers who had worked in Sino-American joint ventures to describe recent interpersonal conflicts with business partners. Each person described a situation with a same-culture manager and a different-culture manager. They made sure that the manager included the relationship to the person, who was involved, what the conflict was about, what caused the conflict, and how the conflict was resolved.

Jehn and Doucet used three quite different methods to identify themes in these data: (1) word counts combined with consensual coding by expert judges; (2) factor analysis of a traditional content-analysis (text unit-by-variable) matrix; and (3) multidimensional scaling of similarity judgments by experts of the scenarios.

1. *Word counts and consensual coding.* There were 7,479 unique words in the corpus on *intercultural* conflicts compared to 2,747 in the corpus on the *intracultural* conflicts. Jehn and Doucet wanted to identify words that were related to conflict, but did not want to impose their own definitions. They asked three expatriate managers who had experiences similar to those of their 76 informants and who were blind to the conditions of the study to go through both word lists and select the words that seemed related to conflict. The three judges went over the lists together and settled on a list of 542 conflict words from the intercultural list and 242 words from the intracultural list. Two out of three judges had to agree before a word was put on the final lists.

In an open discussion to reach consensus, the judges assigned each conflict word to a category. The judges developed 15 subcategories for the intercultural data—things like *conflict*, *expectations*, *rules*, *power*, and *volatile*—and 15 categories for the intracultural data—things like *conflict*, *needs*, *standards*, *power*, *contentious*, and *lose*. Taking into consideration the total number of words in each corpus, conflict words were used more in intracultural interviews and resolution terms were more likely to be used in intercultural interviews.

2. *Traditional content analysis.* Next, two coders read the 152 conflict scenarios (76 intracultural and 76 intercultural) and evaluated (on a 5-point scale) each on

27 different themes. This produced two 76x27 scenario-by-theme profile matrices—one for the intracultural conflicts and one for the intercultural conflicts. The first three factors from the intercultural matrix reflect: (1) interpersonal animosity and hostility; (2) aggravation; and (3) the volatile nature of the conflict. The first two factors from the intracultural matrix reflect: (1) hatred and animosity with a volatile nature and (2) conflicts conducted calmly with little verbal intensity.

3. *Scenario comparisons.* Finally, Jehn and Doucet identified the 30 intracultural and the 30 intercultural scenarios that they felt were the most clear and pithy. Fifty *more* expatriate managers assessed the similarities (on a 5-point scale) of 60–120 randomly selected pairs of scenarios (each pair of scenarios was seen and judged by eight respondents) and described the basis for their judgments. When combined across informants, this produced two aggregate, scenario-by-scenario, similarity matrices—one for the intracultural conflicts and one for the intercultural conflicts. Multidimensional scaling of the intercultural similarity data identified four dimensions: (1) open versus resistant to change, (2) situational causes versus individual traits, (3) high- versus low-resolution potential based on trust, and (4) high- versus low-resolution potential based on patience. Scaling of the intracultural similarity data identified four different dimensions: (1) high versus low cooperation, (2) high versus low confrontation, (3) problem-solving versus accepting, and (4) resolved versus ongoing.

The research by Jehn and Doucet illustrates the rich combination of qualitative and quantitative methods now available for text analysis. Jehn and Doucet collected narratives from their informants and asked their informants to help identify the emic themes in the narratives. Informants sorted key words, coded each scenario for potential themes, and compared scenarios to each other. The analysis of the data from these tasks produced different sets of themes. All three emically induced theme sets have some intuitive appeal and all three yield analytic results that are useful.

In a series of articles on young adult “occasional” drug users, Agar (1979, 1980, 1983) described his grounded methods for content analysis. Agar conducted and transcribed three interviews with each of his three informants. In the 1979 article, Agar describes his initial, intuitive analysis. He pulled all the statements that pertained to informants’ interactions or assessments of other people. He then looked at the statements and sorted them into piles based on their content. He named each pile as a theme and assessed how the themes interacted. Agar found that he had three piles. The first contained statements where the informant was expressing negative feelings for a person in a dominant social position. The second pile emphasized the other’s knowledge or awareness. The third small cluster emphasized the importance of change or an openness to new experiences.

From this intuitive analysis, Agar felt that his informants were telling him that those in authority were only interested in displaying their authority unless they had knowledge or awareness; knowledge or awareness comes through openness to new experience; most in authority are close to new experience or change.

In his second article (1983), Agar systematically tested his intuitive understanding of the data. He used all the statements from a single informant and coded the



statements for their role type (kin, friend/acquaintance, educational, occupational, or other), power (dominant, symmetrical, subordinate, or undetermined), and affect (positive, negative, ambivalent, or absent). Agar realized that he could analyze the covariations among role type, power, and affect, or he could examine the distribution of the themes as they occur throughout the text, or he could simply count the number of statements in the different categories.

Agar restricted his analysis to check his earlier primary finding: that for a given informant, a particular negative sentiment is expressed toward those in dominant social roles. He found that out of 40 statements coded as dominant, 32 were coded negative and 8 were coded positive. For the 36 statements coded as symmetrical, 20 were coded positive and 16 negative, lending support to his original theory.

Next, Agar looked closely at the deviant cases—the eight statements where the informant expressed positive affect toward a person in a dominant role. These counterexamples suggested that the positive affect was expressed toward a dominant social other when the social other possessed, or was communicating to the informant, knowledge that the informant valued.

Finally, Agar (1980) developed a more systematic questionnaire to further test his hypothesis with an independent set of data for one of his informants. He selected 12 statements, four from each of the control, knowledge, and change themes identified earlier. Some statements came directly from the informant. Others he made up. Then he selected eight roles from the informant's transcript (father, mother, employer, teacher, friend, wife, co-worker, and teammate). Each role term was matched with each statement and the informant was asked if the resulting statement was true, false, or irrelevant. (In no case, did the informant report "irrelevant.") Agar then took the responses and compared them to what his hypotheses suggested. The results both met and did not meet his expectations. On balance, there seemed to be general support for his hypothesis, but discrepancies between Agar's expectations and his results suggested areas for further research.

Increasingly, text analysis is about extracting models or schemas from transcriptions of human discourse. In the next section, we review some of the main currents: semantic network analysis, cognitive mapping analysis, Boolean analysis, and schema analysis.

### Structural Analysis and Semantic Networks

The fundamental point of structuralism is that abstractions, called "structures," are in some important way responsible for, or govern, human action. Modern network analysis is based on this principle. Traditional sociological analysis involves a profile matrix—a matrix of things (rows) characterized by values on variables (columns) that characterize the things. Structural analysis, or network analysis, examines the properties that emerge from relations among a set of things. Here the matrix is one of similarities, where rows and columns represent the same things.

The relations among even a small a set of things (the relations among, say, the 30

households in a village, for example, or the 15 countries of the European Union) can be wildly complex. Seeing patterns, if they exist, in such complexity is made possible by applying graph-theoretic methods that enable the visualization of structure through the messiness of surface reality. Hage and Harary (1983) provide other examples of structuralist analysis in anthropology.

The application of graph-theoretic principles and methods to the study of meaning in text is sometimes called *semantic network analysis*. As early as 1959, Charles Osgood (1959) created word co-occurrence matrices and applied factor analysis and dimensional plotting to describe the relation of major factors to one another. The development of computers has made the construction and analysis of co-occurrence matrices much easier and has stimulated the development of this field (Danowski 1982, 1993; Barnett and Danowski 1992).

Jang and Barnett (1994) examined whether there was a national culture—U.S. or Japanese—discernible in the annual letters to stockholders of CEOs in U.S. and Japanese corporations. Jang and Barnett selected 35 Fortune 500 companies, including 18 U.S. and 17 Japanese firms, matched by their type of business. For example, Ford was matched with Honda, Xerox with Canon, and so on.

All of these firms are traded on the New York Stock Exchange, and each year stockholders receive an annual message from the CEO or president of these companies. (Japanese firms that trade on the New York Exchange send the annual letters in English to their U.S. stockholders.) Jang and Barnett read through the 1992 annual letters to shareholders and (ignoring a list of common words like “the,” “because,” “if,” and so on) isolated 94 words that occurred at least eight times across the corpus of 35 letters. This produced a 94(word)-by-35(company) matrix, where the cells contained a number from 0–25, 25 being the largest number of times any word ever occurred in *one* of the letters.

Next, Jang and Barnett created a 35(company)-by-35(company) similarity matrix of companies, based on the co-occurrence of words in their letters. They analyzed the matrix by multidimensional scaling. Figure 1 shows the result—a twodimensional plot of similarities between companies.

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Figure 1. Multidimensional scaling, in two dimensions, of Jang's word co-occurrence matrix for 35 Japanese and American companies. J=Japanese company. A=American company. (Adapted from Jang and Barnett [1994:48]. Reprinted with permission of *Bulletin de Méthodologie Sociologique*.)

It's clear that there are two styles of corporate reporting to stockholders, one American and one Japanese. From a close reading of the texts, Jang concludes that U.S. executives discuss financial information and the structure of their organizations in their letters and Japanese executives focus more on organizational operations.

What is so appealing about word-by-word co-occurrence matrices is that they are produced by computer programs and there is no coder bias introduced other than to determine which words are examined. (See Borgatti [1992] and Doerfel and Barnett [1996] for computer programs that produce word-by-word co-occurrence matrices. See Schnegg and Bernard [1996] for another example of their use.) There is, however, no guarantee that the output of any word co-occurrence matrix will be meaningful, and it is notoriously easy to read pattern (and, thus, meaning) into any set of items.

### Cognitive Maps

Cognitive map analysis combines the intuition of human coders with the quantitative methods of network analysis. Carley's work is instructive. If mental models, or schemas, are in there, she says, they are expressed in the texts of people's speech and can be represented as networks of concepts (Carley and Palmquist 1992:602), an approach also suggested by D'Andrade (1991). To the extent that mental models are widely shared, she asserts, even a very small set of texts will contain the information required for describing the models, especially for narrowly defined arenas of life.

In one study, Carley (1993) asked students some questions about the work of scientists. Here are two brief texts that address questions about the motivation of scientists and their collaboration with colleagues:

*Student A:* I found that scientists engage in research in order to make discoveries and generate new ideas. Such research by scientists is hard work and often involves collaboration with other scientists which leads to discoveries which make the scientists famous. Such collaboration may be informal, such as when they share new ideas over lunch, or formal, such as when they are coauthors of a paper.

*Student B:* It was hard work to research famous scientists engaged in collaboration and I made many informal discoveries. My research showed that scientists engaged in collaboration with other scientists are coauthors of at least one paper containing their new ideas. Some scientists make formal discoveries and have new ideas. (Carley 1993:89)

Carley compares these texts (one 64 words long, the other 48 words) by counting 11 concepts: I, scientists, research, hard work, collaboration, discoveries, new ideas, formal, informal, coauthors, paper. Each concept occurs exactly the same number of times in both texts, yet the texts clearly have different meanings. To analyze the differences in meaning, Carley produces maps of the relation between and among concepts. Concepts are coded for their strength, sign (positive or negative), and direction (whether one concept is logically prior to others), not just for their existence. Figure 2 shows Carley's maps of the two texts.

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*Figure 2.* Coded maps of two student's texts (from Carley [1993:104]. Reprinted with the permission of the American Sociological Association).

This approach to text analysis holds a lot of promise, combining, as it does, the sensitivity of human intuition and interpretation with the labor-saving characteristics of automation. As Carley recognizes, though, a lot depends on who does the

coding—just as in classical content analysis. Different coders (with more or less knowledge of the implicit culture lurking in a text) will produce different maps by making different coding choices. In the end, as with the search for schemas, competency in the native language is one of the fundamental methodological requirements for analysis (see also Carley and Palmquist 1992; Carley 1993, 1997; Carley and Kaufer 1993; Palmquist et al. 1997).

### Analytic Induction and Boolean Tests

Analytic induction is a formal, nonquantitative method for building up causal explanations of phenomena from a close examination of cases. It was proposed as an alternative to statistical analysis by Znaniecki (1934:249–331), and is discussed by Denzin (1978) and Manning (1982), among others. The method involves the following steps: First, define a phenomenon that requires explanation and propose an explanation. Examine a case to see if the explanation fits. If it does, then examine another case. An explanation is accepted until a new case falsifies it.

When a case is found that doesn't fit, then, under the rules of analytic induction, the alternatives are to change the explanation to include the new case or redefine the phenomenon to exclude the nuisance case. Ideally, the process continues until a universal explanation for all known cases of a phenomenon is attained. Explaining cases by declaring them all unique is not an option of the method. Classic examples of analytic induction include Lindesmith's (1947) study of drug addicts, Cressey's (1953) study of embezzlers, and McCleary's (1978) study of how parole officers decide when one of their charges is in violation of parole.

Ragin (1987, 1994) formalized the logic of analytic induction, offering a Boolean approach, and Romme (1995) applies the approach to textual data. Boolean algebra involves two states, true and false (present and absent). With just three dichotomous causal conditions (A and not A, B and not B, and C and not C) and one dependent variable (D and not D), there are 16 possible outcomes (A, B, C, D; A, not B, C, D; A, B, not C, D; and so on).

Schweizer (1991, 1996) applied Boolean logic in his analysis of conflict and social status in Chen Village, China. In the 1950s, the village began to prosper with the application of technology to agriculture. The Great Leap Forward and the Cultural Revolution of the 1960s, however, reversed the village's fortunes. Chan et al. (1984) reconstructed the recent history of Chen Village, focusing on the political fortunes of key actors there.

Schweizer coded the Chan et al. text for whether each of 13 actors experienced an increase or a decrease in status after each of 14 events (such as the Great Leap Forward, land reform and collectivization, the collapse of Brigade leadership, and an event known locally as "the great betrothal dispute"). Thus, he has a 13-actor-by-14-event matrix, where a 1 means that an actor had success in a particular event and a 0 means failure (loss of status). When Schweizer looked at the actor-by-event matrix he found that, over time, 9 of the actors consistently won or lost, but 4 of the actors lost sometimes and won other times. This produces 17 unique combinations of actors

and outcomes.

Schweizer then partitioned the 17 unique cases according to three binary independent variables (urban versus rural origin, proletarian versus nonproletarian background, presence versus absence of external ties) and one dependent variable (whether the actor was a success overall). Table 1 shows the 16 possible outcomes, given four binary variables.

By setting up the logical possibilities, Schweizer was able to discern and test several hypotheses about success and failure in Chen Village. People from an urban background have an advantage, but inspection of Table 1 shows that it's not enough. To ensure success, you should come from a proletarian family or have good external ties and access to information and power at the regional level. Failure is predicted even better: If an actor has failed in the Chen Village disputes, then he or she is of rural origin (comes from the village) OR comes from a nonproletarian family AND has no ties to authorities beyond the village. The Boolean formula for this statement is: *Lack of success*  $\wedge$  *nonurban*  $\vee$  (*nonproletarian*  $\&$  *lack of ties*).<sup>13</sup> The substantive conclusions from this analysis are intuitively appealing: In a communist revolutionary environment, it pays over the years to have friends in high places; people from urban areas are more likely to have those ties; and it helps to have been born into a politically correct (that is, proletarian) family.

TABLE 1  
*The Outcome of 17 Cases from Schweizer's (1996) Text Analysis*

Success	External	Proletarian	Urban	No. of
Ties	Background	Origin		Cases
0	0	0	0	2
0	0	0	1	2
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	2
0	1	1	1	0
1	0	0	0	1
1	0	0	1	3
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	4
1	1	1	1	1

Analytic induction helps identify the simplest model that logically explains the data. Like classic content analysis and cognitive mapping, it requires that human coders read and code the text into an event-by-variable matrix. The object of the analysis, however, is not to show the relationships between all codes, but to find the minimal set of logical relationships among the concepts that accounts for a single

dependent variable. With three binary independent variables, as in Schweizer's data, two logical operators (OR and AND), and three implications ("if A then B," "if B then A," and "if A, then and only then, B"), there are 30 multivariate hypotheses: 18 when all three independent variables are used, plus 12 when two variables are used. With more variables, the analysis becomes much more difficult. Computer programs like QCA (Drass 1980) and ANTHROPAC (Borgatti 1992) test all possible multivariate hypotheses and find the optimal solution. (QCA is reviewed in Weitzman and Miles 1995.)

### Computer-Assisted Text Analysis

One problem with text as data, as all field workers know, is that it piles up quickly. The sheer volume and the problems of handling and sorting through so much information has made text analysis less popular in the past than it is now. What has changed is the presence of computers and of programs that help researchers code and analyze text.

A useful review of the features of currently popular programs is given by Weitzman and Miles (1995). Each of the most popular programs has a devoted group of users who communicate regularly with one another (and with the authors of the programs) on Internet lists. Academic centers specializing in text analysis have also emerged, though mostly outside the United States. Centers at universities in Surrey (Centre for Computer Assisted Qualitative Data Analysis Software) and Kent, England (Centre for Social Anthropology and Computers), as well as Mannheim, Germany (Zentrum für Umfragen Methoden und Analysen) and La Trobe, Australia (Qualitative Solutions and Research) have helped to promote the use of qualitative data across the social sciences.

The panorama with regard to text-processing software is changing quickly. Like early word processors and database managers, the first generation of text processors was designed to help us do what we already did. Today's word processors let us do things that printing presses could not do before computers, and today's database managers, with built-in statistical analysis capabilities, let us do things at our desks that could only be done on a mainframe 15 years ago (and could not be done by anyone 60 years ago).

The first generation of text analysis programs made light work of chores like coding and finding the right quotes with which to illuminate a point in an article. Text processors today still focus on coding and retrieving, but more and more we find features that help with building conceptual models, linking concepts into networks, and producing numerical text-by-variable matrices. Eventually, we expect text processors to contain modules for doing word counts, concordances, KWIC (key-word-in-context) studies, Boolean analysis, map analysis, and semantic network analysis.

### Some General Observations

Text analysis as a research strategy permeates the social sciences, and the range of methods for conducting text analysis is breathtaking. Investigators examine words, sentences, paragraphs, pages, documents, ideas, meanings, paralinguistic features, and even what is missing from the text. They interpret, mark, retrieve, and count. By turns, they apply interpretive analysis and numerical analysis. They use text analysis for exploratory and confirmatory purposes. Researchers identify themes, describe them, compare them across cases and groups, and try to explain them. Text analysis is used by avowed positivists and interpretivists alike.

Text analysts who are linguistically oriented rarely cite the work of their sociologically and anthropologically oriented colleagues, and vice versa. Even within the sociological tradition, the literatures on schema analysis, grounded theory, and content analysis are essentially distinct, though they all involve identifying and refining concepts (for example, categories, codes, themes), coding/marking concepts in text, and linking concepts into theoretical models. One of our goals in this chapter has been to make clear the importance of text analysis for all the social sciences.

We close this review by noting that some questions that might guide research on methods of text analysis include the following:

1. What effect does the selection of textual units (thematic segments, sentences, or words) have on the number, kind, and organization of themes that coders identify?
2. To what extent does increasing or decreasing the number of coders affect the size and composition of these themes?
3. Do different measures of intercoder agreement affect the content of themes?
4. How do different techniques for coding data (into thematic segments, sentences, or words) affect descriptions of the range, central tendency, and distribution of specific themes across informants?
5. Can different coding techniques produce contradictory findings? For example, does an analysis of text segments make groups appear more or less similar than does an analysis of words? Does an analysis of words suggest dimensions of similarity or dissimilarity that are not captured by thematic or sentence segments?
6. Do different methods for systematically treating text identify different sets of prototypical quotes for illustrating major and minor themes?
7. How can we use qualitative and quantitative instruments to produce complementary results? For example, can we identify informants who score high and low on particular survey scale variables based only on their textual data?

Answers to these questions will help us understand better how to make the outcomes and interpretations of qualitative data replicable.



## NOTES

1. Holsti (1969) counted 2.5 content analysis studies per year, on average during the first two decades of this century. By the 1920s, the number had risen to 13.3 per year; in the 1930s it was 22.8, and in the 1940s it was 43.3. By the end of the 1950s, there were over 100 studies a year using content analysis. We did a keyword survey in mid-1997 and retrieved more than 500 book titles, including more than 200 books written since 1990, on “qualitative data analysis” or “text analysis.” The number of journal articles runs into the thousands, with entire journals dedicated specifically to the analysis of qualitative data. These include: *Qualitative Sociology*, *Qualitative Inquiry*, *Journal of Contemporary Ethnography*, *Symbolic Interaction*, *Qualitative Health Research*, *Quality and Quantity*, *Studies in Qualitative Methodology*, and *International Journal of Qualitative Studies in Education*. In anthropology, *Cultural Anthropology Methods Journal* covers text analysis and other methods.

2. We do not review the fields of literary text analysis, biblical text analysis, authorship studies, or hermeneutics. Text analysis in the social sciences owes much to these fields. On hermeneutics, see Bleicher (1982), Bruns (1992), and Dilthey (1996). For a review of methods in literary text analysis, see Segre and Kemeny (1988). For an introduction to biblical hermeneutics, see Hayes and Holladay (1987). An important method, shared by all text analysts, is the production of concordances and KWIC (key-words-in-context) lists. Concordances are annotated lists, by page and/or line number, of the occurrence of every word, phrase, or theme in a text or set of texts. KWIC lists are created by finding all the places in a text where a particular word or phrase appears and printing it out in the context of some number of words (say, 30) before and after it. For examples of major concordances, see Young (1982), Kassis (1983), Spevack (1973), Prendergast (1971). See McKinnon (1993) and Burton (1981a, 1981b, 1982) on the use of concordances in modern literary studies. In authorship studies, differences in the use of words common to the writings of James Madison and Alexander Hamilton led Mosteller and Wallace (1964) to conclude that Madison and not Hamilton had written twelve of the *Federalist Papers*. See Yule (1944) and Martindale and McKenzie (1995) for other examples of authorship studies.

3. Not all of Boas's students agreed that faithful reproduction of narrative was important. Between 1903–1907, Clark Wissler collected 94 Blackfoot tales, all in English. His indigenous collaborator, D. C. Duvall, provided the English translations, which Wissler edited and revised for publication (Wissler and Duvall 1908). As it turned out, only a few of the tales were translated from actual texts. Wissler explained:

In narration the Blackfoot often repeat sentences at irregular intervals, as if they wished to prevent the listener from forgetting their import. Naturally such repetitions were eliminated in the translations. A few narratives were recorded as texts. While texts will be indispensable for linguistic research, the present condition of Blackfoot mythology is such that its comparative study would not be materially facilitated by such records. Each narrator has his own version, in the telling of which he is usually consistent; and while the main features of the myths are the same for all, the minor differences are so great that extreme accuracy of detail with one individual would avail little. (p. 5)

4. The *Pear Story* chronicles what happens to a bushel of pears after they have been picked from a tree. The film is a series of scenes: A man picks the pears from a tree; another man and a goat pass by; a boy on a bicycle stops and rides off with a basket of pears; when the boy turns to look at a passing girl, his hat falls off, he runs into a rock and tips over; three other boys help him up; on walking off, one of the three boys finds the hat; a whistle is heard; and the hat

is exchanged for three pears; the film returns to the picker who looks down at the baskets and scratches his head. The three boys appear eating their pears, and the picker watches them walk off into the distance.

5. For reviews of popular software for text analysis, see Weitzman and Miles (1995). This volume is the current best source of information on the features available in the array of software available for text analysis. For an early, but still useful discussion of software issues in text analysis, see Tesch (1990). For discussions of epistemological issues involved in using computers for the qualitative analysis of texts, see Kelle (1995, 1997), and Lee and Fielding (1995, 1996). Review articles are also found in the *Cultural Anthropology Methods Journal*, *Qualitative Sociology*, and *Computers and the Humanities*.

6. Content analysis has a long history in the social sciences. Good reviews are available in Krippendorff (1980) and Weber (1990). Monitoring newspapers by counting the space given to various themes was already in vogue in the late nineteenth century and early twentieth. By 1910, at the first meeting of the German Sociological Society, Max Weber proposed a major effort at content analysis of the German press (Krippendorff 1980:13). Weber's proposal was not implemented, but content analysis became, and remains, an important method for tracking the impact of news events across time and across print venues (see Danielson and Lasorsa [1997] and Kleinnijenhuis et al. [1997])—and many recent issues of *Journalism Quarterly*—for current examples).

Methods for content analysis were developed vigorously during World War II in studying speeches by Germany's leaders for clues about their intentions in the conduct of the war. In 1955, the Social Science Research Council's Committee on Linguistics and Psychology sponsored a conference on content analysis, bringing together experts from across the social sciences. Their contributions appear in a landmark volume, edited by de Sola Pool (1959). Since then, extensive reviews have appeared every decade or so: Gerbner et al. (1969), Holsti (1969), Krippendorff (1980), Weber (1990), and Roberts (1997).

Today, classical content analysis continues to be used across the social sciences in the study of media (Brouwer et al. 1969; Spiggle 1986; Hirschman 1987; Gilly 1988; Craig 1992; Cameron and Blount 1996; Fink and Gantz 1996; Kolbe and Albanese 1996), political rhetoric (Kaid, Tedesco, and McKinnon 1996; Franzosi 1997), business (Spears et al. 1996), medicine (Cardador et al. 1995; Potts et al. 1996; Sleath et al. 1997), psychiatry, clinical psychology, and counseling (Rosenberg 1990; Smith et al. 1992; Gottschalk 1994, 1997; Handron and Legget-Frazier 1994), and law (Imrich et al. 1995). Content analysis is represented in anthropology in cross-cultural hypothesis testing (White and Burton 1988; Bradley et al. 1990; Ember et al. 1992) and in quantitative, comparative studies of folklore (Colby et al. 1991; Johnson and Price-Williams 1997).

7. The amount of that fraction depends on the number of coders and the precision of measurement for each code. If two people code a theme present or absent, they could agree, *ceteris paribus*, on any answer 25% of the time by chance. If a theme, like wealth, is measured ordinally (low, medium, high); then the likelihood of chance agreement changes accordingly. Fleiss (1971) and Light (1971) expand Kappa to handle multiple coders. Another measure of intercoder agreement for two coders is Scott's pi (Scott 1955), which was generalized by Krippendorff (1980:147–154) for multiple coders, metric data, and any sample size. Craig (1981) generalized Scott's pi for subsets of coders. Craig's measure is particularly useful when one wants to use majority rule in making coding decisions like two out of three coders. See Holsti (1969) for several other measures.

8. Monte Carlo studies might prove helpful. Various types of error could be introduced to see how well a model performs under conditions of uncertainty. Ultimately, however, there may be no single solution but one that is derived within the context of each research problem (Holsti 1969:143).

9. The *General Inquirer* also uses the *Lasswell Value Dictionary* (Namenwirth and Weber 1987; Zuell et al. 1989). More dictionaries are being built for the system.

10. Developing rules for sorting words into dictionary categories requires an understanding of the multiple meanings of words. Concordances (see Note 2) and KWIC (pronounced “quick”), or key-word-in-context lists are used as aids in this process. KWIC lists are created by finding all the places in a text where a particular word or phrase appears and printing it out in the context of some number of words (say, 30) before and after it. Stone et al. (1966:158) created KWIC lists on a corpus of text that had more than a half million words to help revise the *Harvard III Psychological Dictionary*.

11. See Namenwirth and Weber (1987) and Zuell et al. (1989) for information on other dictionaries. Laffal (1990, 1995) created a 43,000-word dictionary that categorized each word into 1–5 of 168 potential concept categories to distinguish themes in different literary works.

12. Rosenberg et al. (1990) transcribed seventy-one speech samples from people who had been diagnosed with psychological disorders (depression, paranoia, somatization) or cancer. The transcripts were hand scored by an expert and analyzed using various editions of the *Harvard Psychosociological Dictionary* (Schnurr et al. 1986). The human coder did better than the computer in diagnosing patients who had cancer, but the computer beat the human coder in identifying the transcripts of people who had been diagnosed with the various psychological disorders.

13. Here are the details of the logic of Schweizer’s analysis. Three possible hypotheses can be derived from two binary variables: “if A then B,” “if B then A,” and “if A, then and only then, B.” In the first hypothesis, A is a sufficient condition to B and B is necessary to A. This hypothesis is falsified by all cases having A and not B. In the second hypothesis, B is a sufficient condition to A and A is necessary to B. The second hypothesis is falsified by all cases of B and not A. These two hypotheses are *implications* or *conditional statements*. The third hypothesis (an *equivalence* or *biconditional statement*) is the strongest: whenever you see A, you also see B and vice versa; the absence of A implies the absence of B and vice versa. This hypothesis is falsified by all cases of A and not B, and all cases of B and not A.

Applied to the data from Chen Village, the strong hypothesis is falsified by many cases, but the sufficient condition hypotheses (urban origin implies success; proletarian background implies success; having external ties implies success) are true in 86% of the cases (this is an average of the three sufficient condition hypotheses). The necessary condition hypotheses (success implies urban origin; success implies proletarian background; success implies external ties) is true in just 73% of cases (again, an average). (There are 7 disconfirming cases in 51 possible outcomes of the 12 *sufficient condition* possibilities—4 possible outcomes for each of 3 independent variables and one dependent variable. There are 14 disconfirming cases in 51 possible outcomes of the 12 *necessary condition* possibilities.) To improve on this, Schweizer tested multivariate hypotheses, using the logical operators OR and AND.

We are sure that many Blackfoot today (not to mention linguists) would rather that Wissler had followed Boas's instructions to gather the texts in the original language and to record the texts as faithfully as possible. See Werner (1995) for a recent argument in favor of verbatim transcription of text.

4. The *Pear Story* chronicles what happens to a bushel of pears after they have been picked from a tree. The film is a series of scenes: A man picks the pears from a tree; another man and a goat pass by; a boy on a bicycle stops and rides off with a basket of pears; when the boy turns to look at a passing girl, his hat falls off, he runs into a rock and tips over; three other boys help him up; on walking off, one of the three boys finds the hat; a whistle is heard; and the hat is exchanged for three pears; the film returns to the picker who looks down at the baskets and scratches his head. The three boys appear eating their pears, and the picker watches them walk off into the distance.

5. For reviews of popular software for text analysis, see Weitzman and Miles (1995). This volume is the current best source of information on the features available in the array of software available for text analysis. For an early, but still useful discussion of software issues in text analysis, see Tesch (1990). For discussions of epistemological issues involved in using computers for the qualitative analysis of texts, see Kelle (1995, 1997), and Lee and Fielding (1995, 1996). Review articles are also found in the *Cultural Anthropology Methods Journal*, *Qualitative Sociology*, and *Computers and the Humanities*.

6. Content analysis has a long history in the social sciences. Good reviews are available in Krippendorf (1980) and Weber (1990). Monitoring newspapers by counting the space given to various themes was already in vogue in the late nineteenth century and early twentieth. By 1910, at the first meeting of the German Sociological Society, Max Weber proposed a major effort at content analysis of the German press (Krippendorf 1980:13). Weber's proposal was not implemented, but content analysis became, and remains, an important method for tracking the impact of news events across time and across print venues (see Danielson and Lasorsa [1997] and Kleinnijenhuis et al. [1997]—and many recent issues of *Journalism Quarterly*—for current examples).

Methods for content analysis were developed vigorously during World War II in studying speeches by Germany's leaders for clues about their intentions in the conduct of the war. In 1955, the Social Science Research Council's Committee on Linguistics and Psychology sponsored a conference on content analysis, bringing together experts from across the social sciences. Their contributions appear in a landmark volume, edited by de Sola Pool (1959). Since then, extensive reviews have appeared every decade or so: Gerbner et al. (1969), Holsti (1969), Krippendorf (1980), Weber (1990), and Roberts (1997).

Today, classical content analysis continues to be used across the social sciences in the study of media (Brouwer et al. 1969; Spiggle 1986; Hirschman 1987; Gilly 1988; Craig 1992; Cameron and Blount 1996; Fink and Gantz 1996; Kolbe and Albanese 1996), political rhetoric (Kaid, Tedesco, and McKinnon 1996; Franzosi 1997), business (Spears et al. 1996), medicine (Cardador et al. 1995; Potts et al. 1996; Sleath et al. 1997), psychiatry, clinical psychology, and counseling (Rosenberg 1990; Smith et al. 1992; Gottschalk 1994, 1997; Handron and Legget-Frazier 1994), and law (Imrich et al. 1995). Content analysis is represented in anthropology in cross-cultural hypothesis testing (White and Burton 1988; Bradley et al. 1990; Ember et al. 1992) and in quantitative, comparative studies of folklore (Colby et al. 1991; Johnson and Price-Williams 1997).

7. The amount of that fraction depends on the number of coders and the precision of measurement for each code. If two people code a theme present or absent, they could agree,

*ceteris paribus*, on any answer 25% of the time by chance. If a theme, like wealth, is measured ordinally (low, medium, high); then the likelihood of chance agreement changes accordingly. Fleiss (1971) and Light (1971) expand Kappa to handle multiple coders. Another measure of intercoder agreement for two coders is Scott's pi (Scott 1955), which was generalized by Krippendorff (1980:147–154) for multiple coders, metric data, and any sample size. Craig (1981) generalized Scott's pi for subsets of coders. Craig's measure is particularly useful when one wants to use majority rule in making coding decisions like two out of three coders. See Holsti (1969) for several other measures.

8. Monte Carlo studies might prove helpful. Various types of error could be introduced to see how well a model performs under conditions of uncertainty. Ultimately, however, there may be no single solution but one that is derived within the context of each research problem (Holsti 1969:143).

9. The *General Inquirer* also uses the *Lasswell Value Dictionary* (Namenwirth and Weber 1987; Zuell et al. 1989). More dictionaries are being built for the system.

10. Developing rules for sorting words into dictionary categories requires an understanding of the multiple meanings of words. Concordances (see Note 2) and KWIC (pronounced "quick"), or key-word-in-context lists are used as aids in this process. KWIC lists are created by finding all the places in a text where a particular word or phrase appears and printing it out in the context of some number of words (say, 30) before and after it. Stone et al. (1966:158) created KWIC lists on a corpus of text that had more than a half million words to help revise the *Harvard III Psychological Dictionary*.

11. See Namenwirth and Weber (1987) and Zuell et al. (1989) for information on other dictionaries. Laffal (1990, 1995) created a 43,000-word dictionary that categorized each word into 1–5 of 168 potential concept categories to distinguish themes in different literary works.

12. Rosenberg et al. (1990) transcribed 71 speech samples from people who had been diagnosed with psychological disorders (depression, paranoia, somatization) or cancer. The transcripts were hand scored by an expert and analyzed using various editions of the *Harvard Psychosociological Dictionary* (Schnurr et al. 1986). The human coder did better than the computer in diagnosing patients who had cancer, but the computer beat the human coder in identifying the transcripts of people who had been diagnosed with the various psychological disorders.

13. Here are the details of the logic of Schweizer's analysis. Three possible hypotheses can be derived from two binary variables: "if A then B," "if B then A," and "if A, then and only then, B." In the first hypothesis, A is a sufficient condition to B and B is necessary to A. This hypothesis is falsified by all cases having A and not B. In the second hypothesis, B is a sufficient condition to A and A is necessary to B. The second hypothesis is falsified by all cases of B and not A. These two hypotheses are *implications* or *conditional statements*. The third hypothesis (an *equivalence* or *biconditional statement*) is the strongest: whenever you see A, you also see B and vice versa; the absence of A implies the absence of B and vice versa. This hypothesis is falsified by all cases of A and not B, and all cases of B and not A.

Applied to the data from Chen Village, the strong hypothesis is falsified by many cases, but the sufficient condition hypotheses (urban origin implies success; proletarian background implies success; having external ties implies success) are true in 86% of the cases (this is an average of the three sufficient condition hypotheses). The necessary condition hypotheses (success implies urban origin; success implies proletarian background; success implies external ties) is true in just 73% of cases (again, an average). (There are 7 disconfirming cases in 51 possible outcomes of the 12 *sufficient condition* possibilities—4 possible outcomes for each

of 3 independent variables and one dependent variable. There are 14 disconfirming cases in 51 possible outcomes of the 12 *necessary condition* possibilities.) To improve on this, Schweizer tested multivariate hypotheses, using the logical operators OR and AND.

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