DAVID T. BASTIEN
TODD J. HOSTAGER

Jazz as a Process
of Organizational Innovation

Jazz is an art form that is inventive and social. It enables individual musicians to create new musical ideas in a collective context and, thereby, to achieve an inventive and integrated performance. Here we present a case study of the process through which four jazz musicians were able to coordinate an inventive performance without the benefit of a rehearsal or the use of sheet music. A videotape of the performance and participant observations provided the data for our analysis. We identify two levels of information—musical and social structures—that constrain invention and enable integration. We then adapt Poole's Multiple Sequence Model (1983) as a device for tracking cognitive and behavioral components of the jazz process in, and across, time. Our analysis highlights the crucial roles of shared information, communication, and attention in this process and identifies a basic strategy that enabled the musicians to invent and coordinate increasingly complex musical ideas. We conclude with implications of our findings for the study and management of organizational innovation in contexts beyond those of group jazz.

Jazz is more than just a style of music that is captured in our collections of records, tapes, and compact discs. It is a celebration of the process of creating music, a form for musical innovation that engages performers as active composers in the collective invention, adoption, and implementation of new musical ideas. As a process of organizational innovation, jazz addresses some central concerns of organizations and their managers. First, jazz is self-consciously spontaneous, creative, and expressive. It is fundamentally concerned with *inventiveness* as an expected mode of

582

thought and behavior. Second, jazz is most typically a social process, involving a group of inventive musicians. Jazz enables individual musicians to coordinate the innovation process so that they achieve a credible and aesthetically pleasing *collective* outcome. The jazz process is built on the assumption that each individual musician is simultaneously and consciously adapting to the whole, supporting the other players, and mutually influencing the outcome. Jazz is thus a truly collective approach to the entire process of innovation, for it requires that the invention, adoption, and implementation of new musical ideas by individual musicians occurs within the context of a shared awareness of the group performance as it unfolds over time.

Jazz is produced through a theory of music and a set of known social practices, both of which enable inventive and integrated performances. As with all of the arts, jazz is also an industry and a profession. Those practitioners who work at jazz as a full-time profession learn the theories and practices more fluently than practitioners who work at it on a part-time basis. Studying how adroit jazz professionals successfully manage the coordination of an inventive performance ought to provide insight into at least one way of managing the process of organizational innovation.

In this article, we examine the jazz process by analyzing a concert in which four musicians accomplished a group performance without the benefit of rehearsal or the guidance of sheet music. By focusing on the process involved in this type of performance, our study differs from prior social scientific investigations of jazz in two important regards. First, previous studies (e.g., Bougon, Weick, & Binkhorst, 1977; Voyer & Faulkner, 1986a, 1986b) focused on a different type of group jazz performance, in which (a) rehearsal is a means for working out an authoritative version of a musical innovation prior to group performance, (b) sheet music is a mechanism of constraint on innovation during performance, and (c) group performance largely consists of the reproduction of previously innovated musical ideas for an audience. Our study instead examines a group performance in which musical invention, adoption, and implementation are collectively determined directly in front of an audience without rehearsal or sheet music.

The second difference between our study and previous investigations is in our use of a "process research" perspective as opposed to a "variance research" perspective (Rogers, 1983, p. 194). Previous studies advanced our understanding of group jazz performance by establishing a map of the

583

perceived causal relationships between such variables as (a) satisfaction with the rehearsal, (b) time spent rehearsing, and (c) the quality of the performance. Our study, however, seeks to advance understanding of group jazz performance by establishing a basic understanding of the "time-ordered sequence of a set of events" (Rogers, 1983, p. 194) in the musical performance.

We begin with an overview of the methods used to generate data in our study, which include a videotape of the performance and observations made by participants in the performance. We then briefly describe the known structural conventions through which the jazz process occurs. Next, we use these structural conventions to interpret the case study data and to identify two basic patterns for organizational innovation in the jazz process. We probe further into the first pattern by adopting Poole's Multiple Sequence Model (1983) as an analytic device for tracking cognitive and behavioral components of the jazz process in, and across, time. This analysis highlights the crucial roles of shared information, communication, and attention in the jazz process. Next, we examine the second pattern in greater detail and identify a basic strategy that enables musicians to invent and coordinate increasingly complex musical ideas. Finally, we close with implications of our findings for organizational innovation in contexts beyond those of group jazz.

Methods

Our case study consists of a jazz concert that was produced by Bob DeFlores and Maytime Productions and performed on June 29, 1985, in Saint Paul, Minnesota. The data for the present study reside in three sources: (a) a videotape of the concert, (b) our written notes of one participant's observations during a review of the videotape, and (c) written observations made by the other participants, based on their review of the videotape and their reading of a case study report that we wrote about the jazz concert.

Arranging and Videotaping the Concert

As students of organizational innovation, we were fortunate to happen upon the videotaped record of a jazz performance that embodied a process of collective musical innovation. The advent of a relatively inexpensive and unobtrusive videotaping technology allows researchers such as ourselves to

584

obtain a fairly complete record of complex behavioral events as they unfold across time in particular organizational contexts. Videotaped data facilitate process research by enabling us to better track events in, and across, time.

The conditions for the jazz concert and the production of the videotape were established by Bob DeFlores and Maytime Productions. Four musicians were selected by the procedures, each according to his general level of professional competence and, in particular, to his ability to play traditional jazz songs (i.e., "standards"). Four participants were invited and received monetary compensation for playing the concert: Bud Freeman on tenor saxophone, Art Hodes on piano, Biddy Bastien (the father of one of the authors) on bass, and Hal Smith on drums. As a group, they represented over 200 years of individual professional experience, although they had no professional experience in playing together as a quartet. Because they had not played together as a quartet, they constituted a "zero-history" group (Bormann, 1975), a group that attempts to accomplish a task collectively without the benefits bestowed by a history of working together.

Although the producers did not conceive of their actions as those of social scientists, the conditions they established for the concert can be viewed as a set of controls for a collective musical innovation task: zero-history, no rehearsal, and no sheet music. In bringing such a group together under these circumstances, DeFlores and Maytime Productions planned a performance in which the entire process of musical invention and integration took place in front of an audience. Arrangements were made with K-TWIN, a video production company, to videotape the entire performance.

Participant Observations on the Videotape
and the Written Case

Upon obtaining a copy of the videotape, we arranged to have one of the participants (Biddy Bastien) view the videotape and make observations about the performance for us. We instructed Bastien to point out and explain the important organizing and communicative behaviors displayed by all four participants as the performance unfolded. On the basis of his observations, we then drafted a written case of the jazz concert, which we provided with the videotape to the other three participants for their observations. The participant observation data were a valuable source of insight for us. Many understandings of the jazz process discussed herein

585

were either explicitly contained in, or directly stimulated by the participant observations. This data source was especially valuable for our description of the structural conventions in jazz.

Structural Conventions in the Jazz Process

Jazz is a process of musical innovation in which a group of performers collectively invents new musical ideas, adopts some of these ideas, and implements the adopted ideas by incorporating them into their performance and by using them as bases for further musical invention. As a collective approach to the process of innovation, jazz specifies a turbulent (Emery & Trist, 1975) task environment for individual musicians, a complex field for interaction in which individuals are simultaneously required to invent new musical ideas and to adapt their playing to that of the collectivity. Turbulence in this environment not only results from the dynamic process of individual invention; turbulence also arises from the dynamic process of coordinating invention. Moreover, these dynamic processes are not independent of one another: The invention of musical ideas affects and is affected by the adoption and implementation of musical ideas. The inherent turbulence in this jazz process produces uncertainty for performers insofar as each musician cannot fully predict the behavior of the other musicians or, for that matter, the behavior of the collectivity.

How is it possible for musicians to manage these dynamic processes and produce an inventive and integrated musical outcome? The answer lies in two sets of structural conventions contained in the jazz profession: musical structures and social practices. These structures serve to constrain the turbulence of the jazz process by specifying particular ways of inventing and coordinating musical ideas. By imposing particular limitations on the range of potential musical and behavioral choices available to performers, these structural conventions also serve as "information" that reduces individual uncertainty (Rogers, 1983, p. 6). Paradoxically, these structures enable collective musical innovation by constraining the range of musical and behavioral choices available to the players (see Appendix).

Musical Structures

The structural conventions specified by jazz music *theory* consist of the cognitively held rules for generating, selecting, and building upon new

586

musical ideas, including rules for proper chords, chordal relationships, and chordal progressions. Musical innovation in jazz is thus neither entirely random nor entirely determined; new musical ideas are invented, adopted, and implemented through rules for musical grammar, much as our everyday discourse is generated through grammatical conversational rules (see Clark, Escholz, & Rosa, 1981). A second type of musical structure—a *song*—is often employed in group performance. As with music theory, songs can be viewed as cognitively held rules for musical innovation. Songs are more concrete and limiting musical structures than jazz theory in that they embody particular patterns of chords and chordal progressions. However, songs allow for inventive variations on such core musical patterns as (a) time, (b) chords and chordal progressions, (c) phrasing, (d) chorus length, and (e) levels of embellishment (complexity). When a particular song is called in a group jazz performance, musicians who know the song have immediate information concerning these and other musical patterns. This information reduces their uncertainty about the collective task and enables them to focus on producing the coordinating inventive variations on musical themes contained in the song. Group jazz based on chordal theory is a type of group jazz performance that does not rely on songs to facilitate invention and coordination. Most group jazz does rely on the musical structures contained in both music theory and songs. Both of these structures were used in the concert that we examined (our appendix contains a more technical and detailed discussion of musical structures).

Social Practices

Social practices, including both *behavioral norms* and *communicative codes*, are a second source of constraint on the jazz process. These unwritten structural conventions are contained in the profession of jazz and are passed on through various socialization practices. *Behavioral norms* are shared expectations about appropriate behavior (Mitchell, 1978). Behavioral norms facilitate integration among the musicians. Examples of behavioral norms in jazz are the following:

1. The nominal leader of the group decides and communicates each song and the key in which it is to be played.
2. The soloist determines the style (time, level of complexity, etc.), and the other musicians are expected to support this determination.

587

3. At one point or another during the performance, each musician gets an opportunity to be the soloist (i.e., the dominant voice that is supported by the others).
4. The chorus is the basic unit of soloist control, unless otherwise specified by the nominal leader (see Appendix).

Each of these norms specifies a particular qualification to the collective or consensual character of group jazz. The first norm indicates an authoritarian function of the nominal leader in determining a particular musical/task structure—a song—through which individual musicians produce an inventive and coordinated performance. The second, third, and fourth norms indicate an authoritarian function that is sequentially shared among all performers; every musician gets to play the role of a leader at some point in the jazz process.

A second type of social practice structure, *communicative codes*, consists of behaviors that are intended to be communicative and that rely on the arbitrary assignment of meaning to behavior, with the arbitrary assignment agreed upon by a community of code users. These codes include (a) lexical items, or words and phrases of distinct meaning in the profession, and (b) nonverbal codes that have become a tradition in the profession (e.g., turning to an individual, eye contact at particular points in the performance, hand signals, changing the volume of one's playing). Codes are vehicles through which musicians communicate about their performance while it is occurring. They are designed to enable clear communication among the performers while remaining relatively unobtrusive to the viewing audience.

Taken together, jazz music theory, songs, and social practices impose structural constraints on the process of collective innovation, constraints that enable inventive and integrated group jazz performances. Next we interpret the case study data in terms of these structural conventions and identify basic patterns in the jazz process of organizational innovation.

Basic Patterns of Events in the Group Jazz Performance

Prior to the actual performance, the four musicians had very little time to discuss what would happen. In the discussion that did occur backstage, the following agreements were reached:

588

1. Freeman (the nominal leader) would call the songs and their keys.
2. The songs called by Freeman would be standards, songs presumably known to most jazz players.
3. Each song would begin with a piano introduction by Hodes, after which Freeman would play the melody and then a few choruses of inventive solo on tenor sax. Next, Hodes would take a chorus or two of inventive solo. Following Hodes, either Freeman would pick up the lead again or Bastien on bass and Smith on drums would alternate on four- or eight-bar "breaks" (i.e., inventive solos in four- or eight-bar lengths).
4. There would be no dragging (i.e., no gradual slowing of tempo).

All four of these agreements reduced the uncertainty of the musicians by providing them with information regarding what to expect and how to behave during the concert. The first agreement cemented a shared understanding that this behavioral norm would be in effect during the performance and reinforced the use of cognitively held information on the level of social practice structures. The information reduced some of the uncertainty for the players, who now knew that Freeman would call the songs and that they should pay attention to him at particular times during the concert. The second agreement also reduced the uncertainty of the musicians by informing them that Freeman would invoke shared musical/task structures—songs known by all four players—on which they would inventively vary, using jazz music theory generative rules. Like the first agreement, the third agreement added to the shared information contained on the level of social practice structures. This agreement reduced at least two sources of uncertainty by providing musicians with information that (a) they would all get a chance to solo during the performance, and (b) they could expect to solo only at particular times during the performance. Like the second agreement, the fourth agreement also added information about musical structures. The musicians now shared an understanding that, regardless of the tempo specified by a particular song, they were not to gradually slow this tempo over the course of the song.

When the players reached their places on stage, Freeman called the first song, "Sunday." This rather simple song has a musical/task structure that specified a relatively limited range of musical choices for the performers. As agreed, the song began with a piano introduction by Hodes. Freeman followed Hodes with a solo on tenor sax. Each musician knew that Freeman would follow Hodes and would play the melody and a few choruses of

589

inventive solo. Toward the end of Freeman's solo, we observed two forms of communicative behavior by Freeman, behavior that signaled to the rest of the musicians that he was relinquishing the lead to Hodes. One such behavior was the music theoretical cue of "winding down" the solo; Freeman signaled the end of his solo by directing his musical invention toward the full resolution of the current chord (see Appendix).

The other communicative behavior was a nonverbal visual cue that Freeman directed at Hodes; shortly (a beat or two) before the end of his solo, Freeman looked at Hodes in order to signal the end of his solo. Both behaviors accessed shared, cognitively held information on the social practice level by signaling that Freeman was indeed giving up the lead according to group expectations. Toward the end of Hodes's solo, Freeman became more active physically, and this activity appeared to focus the attention of the entire group on the change that was forthcoming. At the end of Hodes's solo, Freeman directed a nonverbal communicative behavior—a questioning look—to Bastien and Smith. This behavior accessed information on the social practice level and, congruent with the preconcert agreement, provided Bastien and Smith with an opportunity to take the lead. Both Bastien and Smith responded to Freeman by nodding in the affirmative. The end of the song was verbally cued by Freeman's use of the code "going out."

Following a long bit of banter with the audience, Freeman called the second song, "You Took Advantage of Me." This song had more potential for inventive variation than did "Sunday." As in the first song, the musicians paid a great deal of attention to the soloist. During his solo, Hodes introduced a bass line that was unexpected by Bastien, but because of the heightened attention among group members to the soloist, Bastien readily picked up the change and followed it. Freeman continued to use visual cues to underscore changes in the soloist, looking at the coming soloist and nodding at him. Freeman also used verbal cues to heighten attention at change points and to cue particular behavior patterns. For example, Freeman looked at Smith and called a chorus of "fours." At the end of Smith's chorus, Freeman said "again," indicating to Smith and the rest of the group that Smith would play a second chorus.

The third song, "Misty," allowed for a great deal of inventive variation, particularly in the use of embellished, complex chordal progressions. Despite this opportunity to extend the group's musical inventiveness radically in the direction of greater complexity, Freeman and Hodes chose

590

to stick with simple variations during their solos. This behavior cemented an understanding among the performers on the level of musical structure, an understanding that, from a music theory standpoint, the group would constrain their musical invention to relatively unembellished, simple ideas, regardless of the level of potential embellishment in a particular song.

The first set was finished by a fourth and fifth song, a Hodes solo piece and an early thirties standard. During the fourth song, Hodes used a hand sign—two fingers—to signal a change from 4/4 to 2/4 time. Hodes had used 2/4 time in a previous solo, and his use of the hand sign reinforced an understanding among the other musicians that he preferred to play in this meter during his solos, despite a preference among the others for 4/4 time during their solos. The fifth song was characterized by patterns established in the earlier songs, including unembellished musical invention and Freeman's use of verbal codes to signal his approval of their playing.

The second set began in a less uncertain and turbulent social task environment than did the first set, because musicians could rely on their knowledge of the precedents and preferences worked out in the first set. Because everything was relatively new and unpredictable during the first set, constant visual attention was required of the musicians. During the second set, there was a marked shift from the constant visual attention of the first set to a more selective attention. In the second set, attention was high around the points of potential change by the soloist, but dropped off noticeably between these points. Because they could rely on a greater pool of shared information, musicians could better predict upcoming changes in soloists as well as the preferred patterns of musical invention for each soloist. Due to this phenomenon, Freeman was able to extend his solo by an additional chorus on one song in the second set. He recognized that the attention of the others was focused on him in anticipation of a potential change while they waited for his signals. When Freeman did not cue a change, the others simply followed him into a third chorus of his solo.

The third and final set began in an even less uncertain and turbulent social task environment for the performers. Having two sets of shared performance history to rely on, the group became increasingly adventurous in their invention from the standpoint of musical theory. For the final part of the concert, the group dropped its use of song structures and relied solely on music theory and shared performance history to invent an entirely new song, "Twin Cities Blues."

591

In terms of cognition and behavior, we found at least two basic patterns of events in this case study of collective musical innovation:

1. During the first set, musicians displayed a great deal of attention to each other, with particular emphasis on the soloist and the nominal leader (Freeman), who actively solicited the attention of the musicians during points of potential change in soloists. Freeman's communicative behavior at these points helped to coordinate the group during actual changes by managing attention (Van de Ven, 1986) and by invoking cognitively held norms for behavior. As the concert progressed, this cycle of cognition and behavior became ingrained as shared information among the group members. Attention clearly became more selective among the musicians, for now they could better predict when and to whom they should pay attention. In the latter part of the concert, heightened attention occurred only around points of potential change in the soloist. Freeman found that he no longer had to work at soliciting attention during these points of change and could instead focus on communicating his preferences to the group. Throughout the performance, points of potential change were specified as shared information on two cognitive levels—musical and social practice structures—and were invoked through nonverbal and verbal behavior. As the jazz performance proceeded and a shared social task history was established, information was added on these cognitive levels. This information reduced the uncertainty and turbulence of the jazz process and allowed the musicians to become more selective in their attention.

2. The performance began with Freeman calling songs of limited potential for musical complexity/embellishment and with players inventing simple/unembellished musical ideas. As the concert progressed, Freeman called songs with greater potential for musical complexity, and the jazz players, building on the musical ideas invented during earlier songs, invented more complex musical ideas. Importantly, however, the group did not radically increase the complexity of the ideas it invented from song to song, despite the fact that such increases were allowed by the song structures. Instead, the group established a shared understanding that musical invention would be constrained to simple variations on core musical patterns contained in each song structure (that is, simple relative to the complexity allowed by this structure). By using this strategy for musical invention, the group relied on its history of collectively invented musical ideas to explore a new song and creatively extend its repertoire of invented idea in the direction of greater complexity. Indeed, the concert

592

culminated in a social task with a great deal of potential for musical complexity: the invention of an entirely new song.

Tracking Cognition and Behavior in the Group Jazz Performance

Poole (1983) developed a multiple sequence model to relate different aspects of social task processes. This model suggests portraying group processes as a set of parallel strands or tracks of activity as they emerge over time. Each track represents a different aspect of the process and concerns a different level of data. One of the strengths of this approach is that it allows the analysis of relationships within and across levels. We adapted Poole's approach to our present purposes by designating three tracks to represent the cognitive and behavioral components of change events in the jazz concert: (a) *musical structure*, including cognitively held structural conventions as specified by music theory and by songs, (b) *social structure*, involving cognitively held norms for behavior and communicative codes, and (c) *communicative behavior*, consisting of nonverbal and verbal signs.

In his multiple sequence model, Poole (1983) introduced the concept of breakpoints—points in time when changes occur across all tracks—and found that the direction and basic nature of group activity changed at these points. The breakpoint concept is important to the present study, in that it provides means of analyzing changes in group activity in terms of their cognitive and behavioral components. Figure 1 portrays the multiple sequence tracking for the first three songs of the jazz concert. As shown by the musical structure track, from a music theory standpoint changes in group activity (e.g., changes in soloists) could occur at almost any point during the song on a note-by-note basis, but would most likely occur at the beginnings of bars and phrases.

The level of social structure is shown in the second track that portrays the change event potentials specified by behavioral norms and by the preconcert agreements. Information at this level is more specific as to when the musicians can expect changes to occur; according to the norms of the profession, changes will occur at the ends of choruses. Moreover, the preconcert agreements provided the four musicians with an even greater level of detailed information by specifying who would solo at what point in time and for how many choruses. The social structure imposes even greater
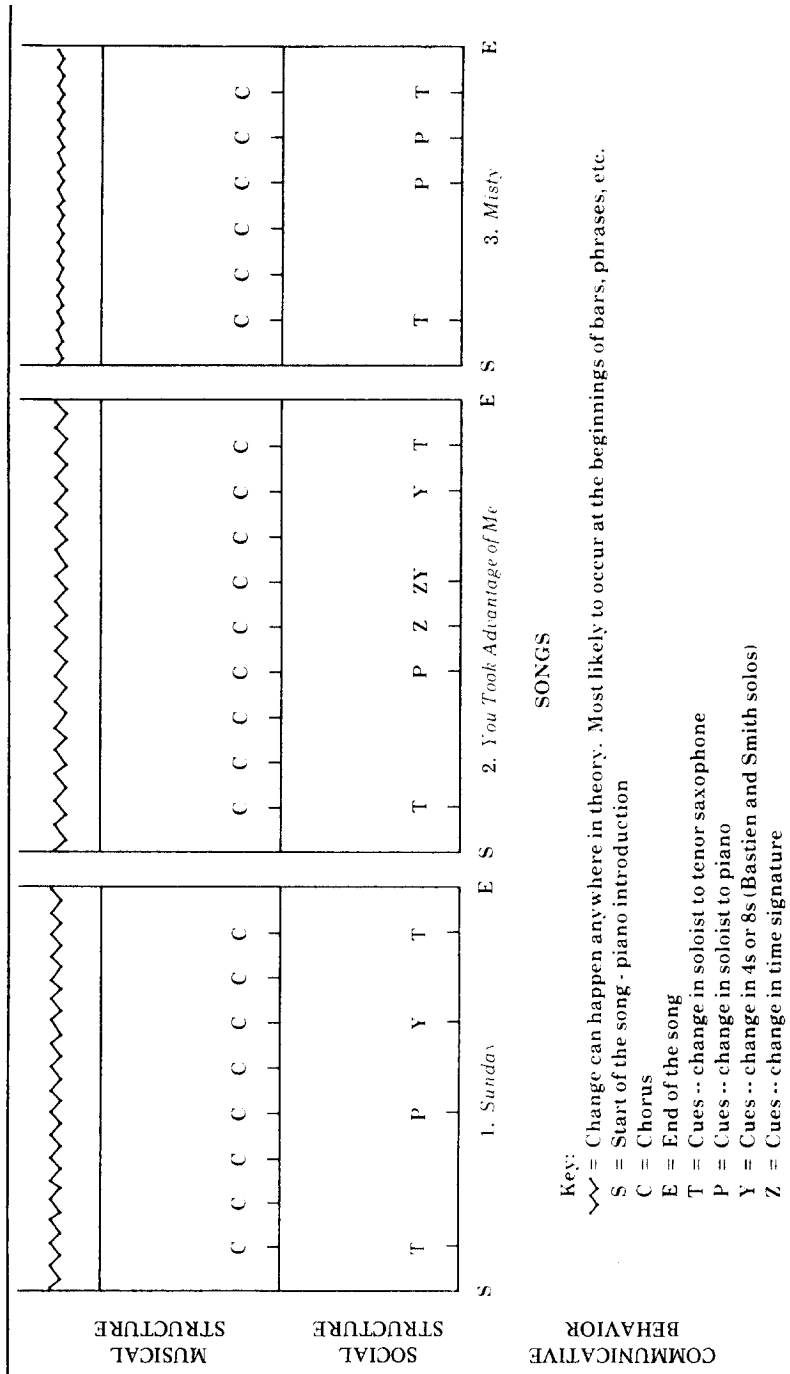
593

SONGS

1. *Sunday* 2. *You Took Advantage of Me* 3. *Misty*

MUSICAL STRUCTURE

SOCIAL STRUCTURE

COMMUNICATIVE BEHAVIOR

Key:
- $\wedge\wedge$ = Change can happen anywhere in theory. Most likely to occur at the beginnings of bars, phrases, etc.
- S = Start of the song - piano introduction
- C = Chorus
- E = End of the song
- T = Cues -- change in soloist to tenor saxophone
- P = Cues -- change in soloist to piano
- Y = Cues -- change in 4s or 8s (Bastien and Smith solos)
- Z = Cues -- change in time signature

Figure 1. Multiple sequence tracking of musical structure, social structure, and communicative behavior for the first three songs in the concert.

594

constraints on individual and group behavior than does the musical structure.

The level of communicative behavior, shown in the third track, indicates that actual changes in the group task were invoked less frequently than allowed by the change event potentials contained in the musical and social structure. What the three tracks reveal is a basic pattern of increasing constraints on individual and group behavior. As we descend from the level of musical structure to the level of social structure to the level of actual communicative behavior, each level further limits the range of behavioral choices available to the jazz performers and thereby enables coordinated musical invention by reducing uncertainty among the players.

Perhaps more important, however, are the revelations (a) that all changes in group activity that occurred during the song were invoked by some form of communicative behavior and (b) that these changes occurred only at the times of change potential that were specified by the musical and social structures. The multiple sequence tracking of a song shows that the potential for change must exist on the levels of musical and social structure before change can be considered and acted on by the players. Moreover, in order for an actual breakpoint or change event to occur, change potentials contained in the shared knowledge of musical and social structure must be explicitly invoked by coded communication among the individual performers. This redundancy across cognitive and behavioral components of the change event is important, for it captures the attention of individual musicians and enables them to enact changes in unison.

Over the course of the concert, preferred patterns of change became ingrained as shared information on both musical and social structure levels. Relying on this information, the musicians could better predict when and to whom they should pay attention. For example, at one point of potential change during the third song, Hodes looked at the drummer and bassist and communicated a change in time from 4/4 to 2/4. These players were able to pick up and enact this change because, based on the pattern established in the previous two songs, they knew that they should pay attention to Hodes at this particular point in the song. When Hodes again switched to 2/4 time in a subsequent solo, this pattern was reinforced as shared information on musical and social structure levels, enabling the other musicians to better predict what was going to happen during Hodes's solos.

595

One important implication flowing from the multiple sequence tracking concerns a relationship between individual knowledge of music theory and social practices and the overall knowledge level of the group. Because the group jazz process relies on *shared* musical and social knowledge, the total knowledge that is usable by the entire group can only equal or slightly exceed the knowledge of the least informed (i.e., the least competent) member of the group. In the concert of study, all four musicians were highly competent in music theory and social practices and shared a knowledge of standard jazz songs. We predict that groups that include musicians of very different knowledge bases will either produce jazz that is not well integrated or will perform at a level roughly equivalent to that of the least competent member.

Centering as a Basic Strategy for Organizational Innovation

The second pattern we identify in the case study is a particular strategy for achieving even greater constraint on musical invention (and hence easier coordination) through choice of repertoire or songs. Freeman began the concert by calling a relatively simple song that contained a limited potential for musical variation. By choosing such a song at the outset, Freeman specified a relatively placid environment for musical invention, a territory in which the musicians tested simple variations on simple core musical patterns in a relatively predictable and certain social task setting. These variations were either rejected or adopted. If adopted, they were implemented through repetition and were used as bases for further variation. One way of conceiving this collective process of inventing, adopting, and implementing musical ideas is as a "centering strategy." As represented in Figure 2a, the jazz musicians began with a center that consisted of shared information regarding jazz music theory, song structures, behavioral norms, and communicative codes. This center of shared information specified potential paths of musical invention for the musicians, who then selectively invented ideas along some of these paths. The group, in turn, then selectively adopted some of these ideas/paths and implemented them into organizational practice as shared bases for further musical invention. As represented in Figure 2b, the center of shared knowledge was extended outward by incorporating all of the ideas/paths

596

597

Potential Path

Taken Path

New Center for
next song includes
everything from
previously taken
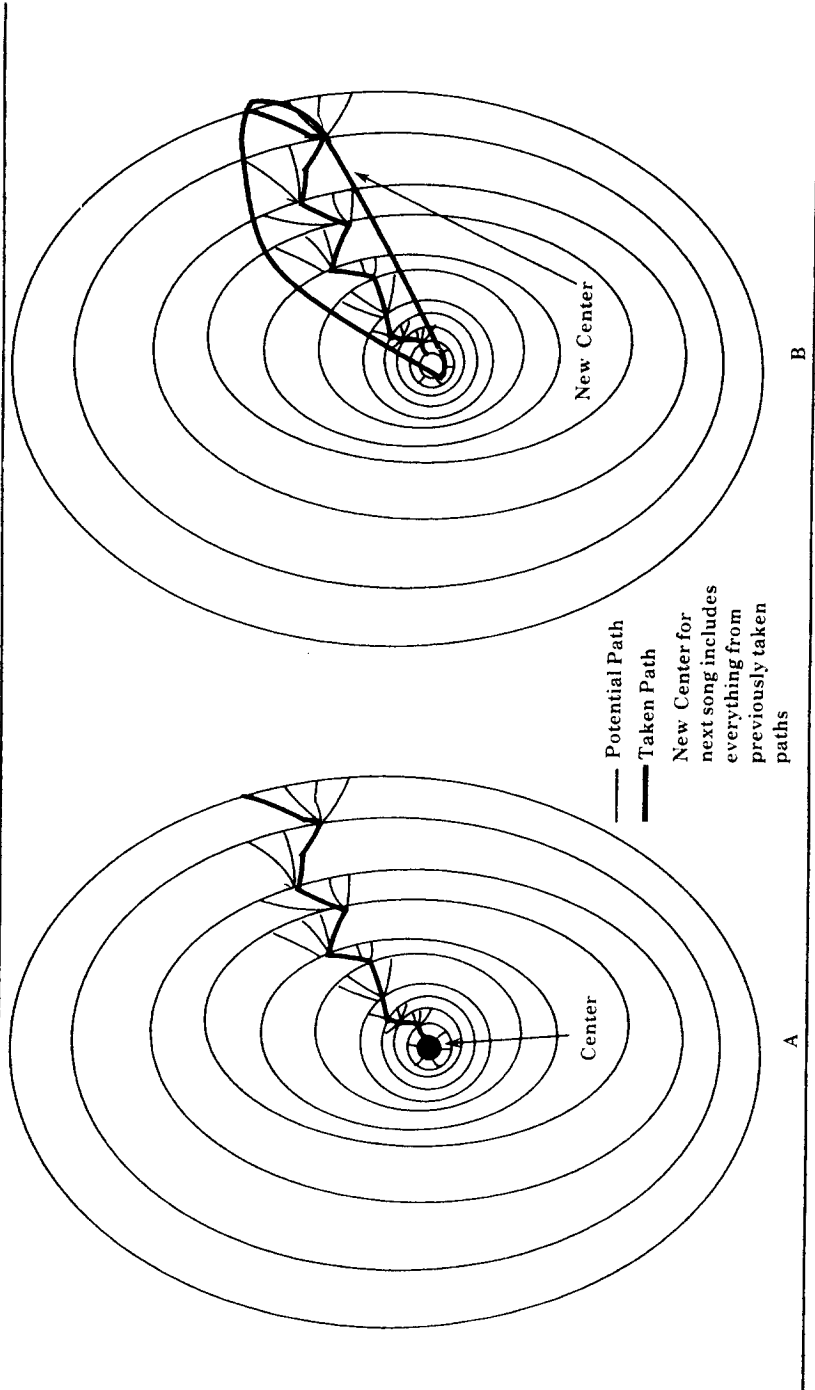paths

Center

New Center

A

B

Figure 2. The centering strategy for organizational innovation.

implemented in the previous songs and the group became capable of inventing and coordinating more complex musical variations.

This phenomenon allowed Freeman confidently to lead the group in the direction of greater inventive complexity as the jazz concert progressed. With each successive song, the group relied on its ever-increasing center of shared information to invent and integrate increasingly complex musical ideas. Indeed, this strategy allowed the group to extend its center of shared information to the extent that it could successfully accomplish an immensely complex task: Unguided by an existing song structure, the group invented and coordinated an entirely new song. The centering strategy can be a successful method for incrementally moving a group or organization into new and unknown social task environments.

Implications for Understanding the Organizational Innovation Process

As in group jazz, the social task environment for many modern organizations is basically turbulent and only marginally predictable; situations such as mergers, acquisitions, divestitures, joint ventures, entries into new markets, and development of new industries entail considerable turbulence and uncertainty for organization members (Van de Ven, Angle, & Poole, in press). Individuals in these organizational circumstances face uncertainty similar to that experienced by jazz players during a collectively improvised performance. We saw that jazz musicians rely on two types of structural conventions to constrain their behavior, reduce uncertainty, and diminish turbulence. The level of musical structure specifies particular limitations on the musical choices available to the players. Similarly, task structures in business, (such as formally specified and coded constraints like legislation, industry regulation, governmental mandates, technical theories, organizational mission statements, strategic plans, policies, and procedures) specify particular limitations on behavioral choices available to organization members. In both jazz and business, the social level of structural constraint on behavior involves relatively informal norms and codes that concern interpersonal relations and communication.

In the present case study information on the level of social structure mediates between task structure and behavior. Social structure is, in jazz and business, essential for innovation in organizations. This level informs the players of potential changes in the nature of the innovation activity and

598

the probability that changes will occur. Moreover, we found that social task processes in general are critically reliant on shared knowledge. This evidence implies that social tasks involving individuals of different knowledge bases will be problematic. Lastly, we identified a successful strategy for moving an organization into new, unknown territory. This case study shows that a centering strategy can be effective in accomplishing this goal, for it allows organization members to accommodate a new and unknown social task environment gradually and transform it into an old, known environment. Indeed, Bastien (in press) observed this phenomenon in a corporate acquisition, where centering was effectively used as a strategy for managing the disjunctive change felt by the organization. Kanter (1985) also discussed the strategy of centering as a technique for managing change.

Consistent with these findings, we anticipate that communication and management researchers will be able (a) to isolate certain of the operative task and social structures in cases of organizational innovation, (b) to track these structures and communicative behavior across time, (c) to identify breakpoints in the process of innovation, and (d) to generate additional data concerning the shared knowledge hypothesis and centering strategy. We believe that this line of research holds promise for increasing our knowledge of organizational innovation, knowledge that can be used to critique instances of socially improvised task activity, instruct individual players in task and social structures, and to train players in necessary attention and communication skills.

The history of jazz has been recorded in such a way that we primarily remember great individual musicians and we think of their contributions as solely owned. A more complete review of the history of jazz would reveal that the great contributions to the art form (and indeed the great individuals) were realized in a social and professional context. Lester Young's contribution, for example, would not have been realized outside of a contest in which he *and* his supporting players were all thoroughly competent in the structural knowledge and processual skills of the jazz profession. An overemphasis on individual expression and creativity occurred during the past 25 years or so in the jazz profession, an emphasis that leads us to forget the extent to which jazz is inherently and fundamentally a collective activity. The present study emphasizes a more balanced approach to understanding and managing organizational innovation, one in which individual invention is embedded in a collective

599

context and is inseparable from the inventive and integrative activity of the entire group. Great jazz and great advances in the art have not been achieved by stars against a placid background. Rather, greatness in jazz resulted from a constellation of cooperatively improvising artists, each of whom has a chance to shine as a star.

Appendix

*A Technical Overview
of Musical Structures in Jazz*

Jazz is a variant of Western music theory that is concerned with various arithmetic relationships and sequences. Jazz theory enables the production of inventive and coordinated musical outcomes through the spontaneous and creative use of generative rules that specify particular ways of inventing and coordinating musical ideas. Although this approach to music theory is unique in Western music, there are similar approaches to music theory in Eastern music (notably, the raga music of India). The technical overview that follows is an extremely simplified representation of musical structures in jazz, intended as an introductory illustration of these structures.

In the jazz theory of music generation, an octave is divided into 12 evenly spaced intervals, each of which is given a letter name: C, D flat, D, E flat, E, F, G flat, G, A flat, A, B flat, and B. This array of 12 notes is called a *chromatic scale.* Major and minor scales, however, are the compositional basis of most jazz. These are specific sequences of an uneven division of the octave into 8 intervals. For instance, a C Major scale contains only the following intervals: C D E F G A B C. In other words, in a major scale, the second, fourth, seventh, and eleventh intervals are skipped. In minor scales, a different pattern of skipping chromatic tones is used to achieve the scale. Jazz has traditionally relied on four scales, although others are sometimes employed: major scales, minor scales, dominant seventh scales, and minor seventh scales. All four employ the same logic of selecting 8 unequal intervals from a 12-tone chromatic scale, but the sequences are different in each of the scales.

A chord is a specific sequence of tones within a major or minor scale, further eliminating some notes. For instance, a C Major chord (called a *triad,* in this case) includes only the first, third, and fifth interval in a

600

C Major scale (C E G). Chords in each of the scale families can be embellished through the addition of further tones from the scale. For example, a C6 chord is the major triad (C E G) plus the sixth interval of the C Major scale (A).

Either embellishments resolve to a specific following chord, or they do not resolve at all (i.e., they are terminal, signaling the end of a phrase). This characteristic of chordal embellishment allows musicians to take many different theoretical paths within the same basic chord.

In jazz theory, a song is principally a sequence or progression of chords. Often these are repeating short sequences, with AABA sequences being the most common. Here a sequence of chords is established (the A sequence), played through a second time (AA), followed by a different sequence of equal length (AAB), and finally repeated (AABA). The AABA sequence is called a *chorus*. In general, songs prescribe only basic chord families and not specific embellishments, leaving embellishment choices up to the musicians.

The melody of a song is composed of notes contained within the chords of the progression, as are all of the notes played by the musicians who provide the background that supports the melody. For example, if a saxophonist is playing the melody and is backed up by a bassist, pianist, and drummer, all four will be playing notes that are different and yet congruent with the chordal structure of the song. The relationship between melody and accompaniment is complicated by the concept of embellishment, however, and when one musician plays notes from a specific embellished chord, the others must pick up that embellishment if the performance is to sound good or integrated. Finally, the dominant or lead voice is called the soloist, despite the fact that often the other musicians are still playing and providing background support to the soloist.

References

Bastien, D. T. (in press). Communication, conflict, and learning in mergers and acquisitions. In A. H. Van de Ven, H. L. Angle, & M. S. Poole (Eds.), *Research on the management of innovation* (Vol. 1, chap. 11). Cambridge, MA: Ballinger.

Bormann, E. G. (1975). *Discussion and group methods* (2nd ed.). New York: Harper & Row.

Bougon, M., Weick, K., & Binkhorst, D. (1977). Cognition in organizations: An analysis of the Utrecht Jazz Orchestra. *Administrative Science Quarterly, 22*, 606-639.

Clark, V. P., Escholz, P. A., & Rosa, A. F. (1981). *Language: Introductory readings* (3rd ed.). New York: St. Martin's.

Emery, F. E., & Trist, E. L. (1975). *Towards a social ecology: Contextual appreciations of the future in the present.* London: Plenum.

Kanter, R. M. (1985). *The change masters: Innovations for productivity in the American work place.* New York: Simon & Schuster.

Mitchell, T. R. (1978). *People in organizations: Understanding their behavior.* New York: McGraw-Hill.

Poole, M. S. (1983). Decision development in small groups: III. A multiple sequence model of group decision development. *Communication Monographs, 50*, 321-341.

Rogers, E. M. (1983). *Diffusion of innovations* (3rd ed.). New York: Free Press.

Van de Ven, A. H. (1986). Central problems in the management of innovation. *Management Science, 32*, 590-607.

Van de Ven, A. H., Angle, H. L., & Poole, M. S. (Eds.). (in press). *Research on the management of innovation* (Vols. 1 & 2). Cambridge, MA: Ballinger.

Voyer, J. J., & Faulkner, R. R. (1986a). Cognition and leadership in an artistic organization. *Proceedings of the National Academy of Management* (pp. 160-164). Chicago: Darby Press.

Voyer, J. J., & Faulkner, R. R. (1986b). *Strategy and organizational cognition in a simple professional bureaucracy.* Unpublished manuscript, Rutgers University, Newark, NJ.

602