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Communication-Related Organizational Structures and Work Group Temporal Experiences: The Effects of Coordination Method, Technology Type, and Feedback Cycle on Members' Construals and Enactments of Time

Dawna I. Ballard & David R. Seibold

This study explores how differences in three communication-related structures central to organizational work—coordination methods, workplace technologies, and feedback cycles—influence organizational members' experience of eleven dimensions of time—flexibility, linearity, pace, punctuality, delay, scheduling, separation, scarcity, urgency, and present and future time perspectives. Analyses of data from five residential services departments in a West Coast University revealed that differences in coordination method, technology type, and feedback cycle characteristics helped to shape members' experience of ten dimensions of time—flexibility, linearity, pace, punctuality, delay, separation, urgency, scarcity, and future and present time perspectives. As hypothesized, members of work groups whose feedback cycles included an extended task completion interval and high task variability exhibited a greater future-time perspective than group members whose feedback cycles were characterized by brief intervals and low task variability.

Keywords: Chronemics; Time; Organizations; Communication; Feedback; Coordination; Technology

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The study of human temporality is inherently the study of human communication. Social constructions of time exist intersubjectively through persons' interaction and coordination with others, as well as in their shared symbolic representations of temporality (Bourdieu, 1977; Giddens, 1984). This investigation explores these constitutive communication processes in organizations vis-à-vis work group members' temporal experiences. By focusing attention on members' day-to-day practices that are enabled and constrained by key organizational structures (i.e., task interdependencies, workplace technologies, and feedback cycles), the fundamental communication processes intrinsic to members' negotiated temporality are highlighted. As elaborated subsequently, differences in members' task-related interdependence implicate their *coordinative* practices and, in turn, order their temporal patterns (Thompson, 1967). Workplace technologies in use (Orlikowski, 2000) structure—both in speed and form—members' *interaction* behaviors and shape their experience of time (Dubinkas, 1988a). Finally, feedback cycles—symbolically represented in specific timelines and deadlines—direct members' activities toward particular temporal signposts and influence their temporal experience in the process (Lawrence & Lorsch, 1967). In organizations, members' temporality is mediated through their group membership and reflected in their shared language. Thus, the experience of time in work organizations is fundamentally an *intersubjective* phenomenon (Roy, 1960; Zerubavel, 1981).

This focus on elemental characteristics of human communication (i.e., coordination, interaction, symbolic representation, and intersubjectivity) as a way to understand members' experience of time places communication at the center of studies on workplace temporality, rather than the periphery as is the case in other disciplines' treatments of time. Among the deluge of research in this area (Albert & Bell, 2002; Ancona, Okhuysen, & Perlow, 2001; Barkema, Baum, & Mannix, 2002; George & Jones, 2000; Harrison, Price, Gavin, & Florey, 2002; Huy, 2001; Lee & Liebenau, 1999; Mosakowski & Earley, 2000; Nandhakumar & Jones, 2001; Perlow, 1999; Starkey, 1989; Waller, Giambatista, & Zellmer-Bruhn, 1999; Yakura, 2002), none offers a relevant communication perspective. This lacunae is surprising given that dominant social theorists who have wrestled with time have located it in interaction (Bourdieu, 1977; Durkheim, 1915; Giddens, 1979). Recently a theoretical framework was outlined (Ballard & Seibold, 2003) that takes communication seriously (Burlinson, 1992) as the fundamental process shaping organizational members' experience of time and asserts a mutually constitutive relationship between time and communication. The framework employed in this paper is grounded in communication theoretically and empirically. Theoretically, it is supported by social entrainment and community of practice perspectives—interactional approaches to understanding organizational members' temporal experience in work groups. Empirically, it locates group members' shared temporality in their language as reflected in the method used to assess members' temporal experience in this investigation.

An empirical study of a portion of Ballard and Seibold's (2003) broader theoretical framework on workplace temporality is reported here. Specifically, the relationship between three communication-related structures central to organizational

work—coordination methods, workplace technologies, and feedback cycles—and eleven dimensions of time—flexibility, linearity, pace, punctuality, delay, scheduling, separation, scarcity, urgency, and present and future time perspectives—is examined. To begin, the theoretical bases for these relationships (social entrainment and communities of practice) are reviewed below. Next, the eleven dimensions of time and three workplace communication-related structures are explicated, and we propose three research questions and one hypothesis. This is followed by a description of the setting and methods used in the investigation and a report on the findings. Finally, limitations to the study are noted, implications of the findings are discussed, and directions for further research are addressed.

Theoretical Foundations

Social Entrainment

Undergirding this investigation is the assumption that social constructions of time exist intersubjectively through persons' coordination and interaction with others, as well as in their shared use of symbolic representations of temporality. The social entrainment perspective, introduced into group and organizational research by McGrath and Rotchford (1983) and elaborated by Ancona and Chong (1996), underscores both the interactional and intersubjective aspects of workplace temporality. It rests on five assumptions (McGrath & Kelly, 1986). First, much of human behavior is temporal—that is, regulated by cyclical, oscillatory, and rhythmical processes. Second, these rhythms are endogenous, or intrinsic, to systems. Third, sets of internal rhythms become synchronized within each system (i.e., they adopt the same phase and periodicity of occurrence). Fourth, when persons *interact* their internal rhythms can become entrained to one another. Fifth, the internal rhythms of individuals and social groups can become *collectively* entrained, or synchronized, to powerful external pacers, altering the phase and periodicity of their endogenous rhythms.

The fourth and fifth assumptions express the view that human temporality inheres in human communication—both via members' interaction and reflected in their intersubjective experience. Empirical evidence indicates that group members become entrained to the task cycles of their work environments. As will be shown, the external pacers include organizational members' daily practices vis-à-vis the workplace technologies, feedback cycles, and interdependencies they manage (Kelly, Futoran, & McGrath, 1990; Kelly & McGrath, 1985).

Communities of Practice

Rooted in Bourdieu's (1977) practice theory, Wenger's (1998) community of practice (COP) perspective focuses attention on work groups as a site of organizational members' temporality (Ballard & Seibold, 2000, 2003). Communities of practice are defined by mutual engagement, a joint enterprise, and a shared repertoire. First,

mutual engagement concerns the complementary and sometimes overlapping contributions of diverse work group members to a shared task. Second, negotiation of this joint enterprise creates mutual accountability among members, and is situated within and influenced by the larger system of which the members are a part. It is important to note that neither mutual engagement nor joint enterprise requires homogeneity or agreement among members. The community, and intersubjectivity, exists in members' negotiation of meaning. Third, members own a shared repertoire of words, concepts, actions, routines, tools, and the like, which emerge in the course of their involvement with each other.

COP is centered on constitutive communication processes. For instance, group members' interaction in carrying out their routine activities is central to the process of mutual engagement. Also, coordination is required to negotiate their joint enterprise, especially within larger contexts of institutional control. Finally, a shared repertoire relies on symbolic representations. The relevance of communities of practice to group members' shared experience of time inheres in the communication processes by which time is constituted. The routine ongoing practices that define these types of groups involve the requisite interaction, coordination, and symbolic representations necessary to develop shared experiences of time in the workplace. Changes in specific practices can lead to changes in their communication behaviors (e.g., in interaction, coordination, or shared language) and, consequently, in their shared temporality. Notice that the concern is with organizational time, which is limited to members' experience at work and is not necessarily related to their experience elsewhere. In some occupations, however, there is a direct relationship between the two (Bailyn, 1993; Ylijoki & Mantyla, 2003).

All communities of practice do not share the same temporal experience, nor do all people who share similar temporal enactments and construals constitute a community of practice. For instance, a cross-functional team whose members work with different project timelines and different technologies may never coalesce around shared temporality (which is also associated with the performance challenges in CFTs; see Seibold & Shea, 2001). Similarly, accountants are described in the literature as possessing a shared orientation toward the present and future (Starkey, 1989); however, a random group of accountants is not a community of practice. Shared communication does not necessarily mean shared temporal experience, and shared temporal experience does not necessarily require shared communication among each and every person in the community. Nevertheless, structure *and* agency are critical in shaping members' practices (Giddens, 1984). Attention to the ways in which group members' produce, reproduce, and modify these structures reveals the role of communication (interaction, coordination, and symbolic representation) in effecting shared temporality.

Both the social entrainment and communities of practice perspectives inform this investigation, which in turn is rooted in the theoretical framework proposed elsewhere (Ballard & Seibold, 2003). Intersubjective experiences of time in organizations are generated in interaction, located in work group membership vis-à-vis their shared practices surrounding task interdependence, feedback cycles, and workplace

technologies, and reflected in members' shared language and linguistic representations. Eleven dimensions of time focal in the present investigation are explicated below.

The Experience of Time in Organizations

A review of workplace temporality research (Ballard & Seibold, 2003) yielded 10 dimensions of time—flexibility, linearity, pace, punctuality, scheduling, separation, scarcity, urgency, and present and future time perspectives—that might be associated with members' level of task interdependence, their use of workplace technologies, and their unique feedback cycles. These dimensions were evaluated through scale development and validation procedures (Ballard & Seibold, 2004). The results of a confirmatory factor analysis supported the existence of 11 dimensions—each of the hypothesized 10 dimensions and an additional dimension labeled *delay*. Table 1 lists the items that comprise each dimension (and their reliabilities). A complete discussion of the development and validation procedures may be found in Ballard and Seibold (2004). This list is not intended to be exhaustive of all dimensions of temporal experience for organizational members. For example, past time perspective is an important dimension that often differentiates organizational groups (Gherardi & Strati, 1988). The 11-dimension model does highlight the ways in which these three organizational communication structures shape work group members' experience of time, and certain dimensions of time (like past time perspective) are not relevant for the structures of interest in the present investigation.

The eleven dimensions of time can be grouped within two distinct categories: *enactments of time* (which refer to temporal performance and include the dimensions of flexibility, linearity, pace, punctuality, delay, scheduling, and separation) and *construals of time* (which refer to the way work group members orient to time and include the dimensions of scarcity, urgency, and present and future time perspective). These dimensions and their roles in organizational members' work lives are elaborated subsequently. A more extensive treatment can be found in Ballard and Seibold (2003).

Enactments of Time

Organizational units and their members create temporal norms for behavior through regularized patterns of interaction. These behaviors are reflected through their enactments of temporal flexibility, linearity, pace, punctuality, delay, scheduling, and separation.

Flexibility pertains to the degree of rigidity in time structuring and task completion plans (Ballard & Seibold, 2000). Temporal flexibility may be a function of the task or a consequence of organizational norms and practices. Academic work, for example, is considered high in flexibility because the very nature of the work tends to allow individuals a good deal of autonomy over the process (Starkey, 1989). Far from a panacea, Bailyn (1993) points out that the flexibility and autonomy inherent

in professorial work is then exchanged for an increased workload that lacks any temporal boundaries separating it from nonwork time.

Pace refers to tempo or rate of activity (Lauer, 1981; Levine, 1988; Moore, 1963). Organizational units and their members may adopt an accelerated work pace to cope with numerous tasks or with the speed of inputs within a defined span of time. Similarly, groups are described as fast-paced or slow-paced depending on the rate of input of stable or new stimuli in their environment.

Separation indexes the degree to which extraneous factors are eliminated or engaged in the completion of a work task (Hall, 1983; Perlow, 1997). Under high levels of separation, extraneous factors may be interpreted and semantically represented as unwelcome interruptions. Screening behaviors, including closing the door or not answering the phone, are common in these situations. Perlow's (1997) intervention to help manage the time famine that organizational members experienced included instituting quiet time when persons were generally prohibited from interrupting co-workers during specific blocks of time. In contrast, low levels of separation are evident in such structures and discursive representations as open-door policies used to communicate less restricted temporal norms.

Scheduling reflects the extent to which the sequencing and duration of plans, activities, and events are formalized (Yakura, 2002; Ylijoki & Mantyla, 2003). A variety of organizational timelines (Gantt charts, PERT charts, project timelines, milestone charts) function as temporal boundary objects that make time concrete and visual—and thus enable scheduling. Yet these (mono)temporal artifacts simultaneously leave time negotiable for various groups of participants who must coordinate their activities around such scheduling devices—thus rendering time interpretable within each group (e.g., on time, out of time, overtime, downtime) (Yakura, 2002).

Whereas separation and scheduling each concern unique temporal aspects of the task environment, temporal *linearity* is associated with actual task execution. Hassard (1996) elaborates: “[in a linear treatment of time] temporal units are seen as finite.... Events become more concentrated and segregated, with special ‘times’ being given over for various forms of activities. Time is experienced not only as a sequence but also as a boundary condition” (p. 583). Hassard cites the segmentation of parts and processes in time and space beginning with the Industrial Revolution as an example of linearity in the modern workplace. By contrast, more cyclic time is enacted as irregular, event-based, improvisational, and often reflected in multitasking.

Punctuality and *delay* refer to the exacting nature of timing and deadlines. These dimensions are conceptualized as separate constructs because of the multiple temporal commitments inherent in workplace responsibilities and job roles, and because of norms surrounding timing. Although a specific project may be running behind schedule or delayed, for example, organizational members may still respond to work requests quite promptly. They are enacting both punctuality and delay. Alternatively, there may be lateness norms surrounding arrival to regular meetings or to work—perhaps members usually arrive closer to 9:10 a.m. for a 9:00 a.m. meeting or shift

(Blau, 1995). It would be inaccurate to characterize this behavior as prompt. Given the shared norms, it would be equally inaccurate to consider it as running late. These two concepts connote different things. Members may be neither punctual nor delayed.

Construals of Time

Beyond *enactments* of the temporal dimensions, group members *construe* time in certain ways. These construals are reflected in their temporal perspective (present and future) and their construals of the scarcity and urgency of time.

Temporal *perspective* concerns whether group members are oriented toward the present or future (Lauer, 1981; Waller, Conte, Gibson, & Carpenter, 2001). According to Jones (1988, p. 26):

We can distinguish between time as a structured, unitized measure of the sequence of unfolding events, *compelled toward some distant outcome*, and time as the backdrop for behaviors, thoughts, and feelings. The former is a conception of action that occurs within a time that flows linearly, inexorably, and necessarily forward. It is a perspective that is strongly guided by the future. The latter is a feeling of behavior that occurs *in-time*, where time consciousness is suspended and action occurs in the infinite present.

The need to engage in long-term planning tends to engender a strong future orientation in organizational members (Jaques, 1982), whereas the need to develop strategies designed to address a range of emergent problems tends to bring about a present-centered focus (Schein, 1992).

Scarcity is defined as the construal of time as a limited and exhaustible resource. Temporal scarcity is emphasized in work situations characterized either by too many inputs within a given unit of time or by not enough time to complete a task, as reflected in the construct role overload (McGrath & Kelly, 1986). Groups also may have more time than they need to complete a task and find themselves experiencing underload.

Construals of temporal *urgency* describe persons' preoccupation with deadlines and task completion (Gastorf, 1980; Meuser, Yarnold, & Bryant, 1987; Waller et al., 2001). Units characterized by constant stimulus–response interactions are likely to hold a sense of temporal urgency, or urgency may reflect a temporary valuation of time based on an impending deadline. Urgency is focused on the task, whereas scarcity is focused on the (temporal) resources available to complete it. For example, a group may have a sufficient amount of time to complete a task, but still feel a sense of urgency in completing it due to the importance of the task.¹

Organizational Communication Structures

Three organizational structures are central to the production of work and mediate the recursive effects of group members' views of time and their work. The communicative aspects of coordination requirements, workplace technologies, and feedback

cycles associated with task performance are related to the experience of time and, in turn, to temporal constraints on work. Each is a *communication-related* structure, and their relationships with the experience of time for organizational groups are explicated.

Activity Coordination Methods

The type of *coordination* required among organizational groups prescribes and delineates the communication processes involved (McPhee & Zaig, 2000). In Thompson's (1967) view, varying coordination needs linked to internal task interdependencies foster organizational communicative requirements, including the frequency of units' communication.

The issue of communication frequency reflects the temporal constraints of various types of coordination. Thompson (1967) describes these relationships in his typology of the three types of interdependence among organizational groups, and the corresponding coordination required: *pooled* interdependence, in which efficient coordination is accomplished through standardization; *sequential* interdependence, in which efficient coordination is accomplished through planning; and *reciprocal* interdependence, in which efficient coordination is accomplished through the ongoing mutual adjustment of units. Standardization, planning, and mutual adjustment are inherent structures for organizational communication—ranging from routinized to dynamic. Each of these methods of coordination entails varying levels of communication and explicitly different temporal strategies.

Pooled interdependence exists when each unit produces distinct products or services that are not directly contingent upon another unit's performance, but each is impacted by the performance of all other units based upon their shared fate as members of the larger collective. In these cases frequent communication is unnecessary for task completion, and activity coordination can be regulated through establishing regular temporal standards for behavior. Requiring all employees to report to work at 9 a.m. to begin the workday, go to lunch at 12 p.m., and leave the office at 5 p.m. is an example of a standardized temporal policy.

Temporally serial relationships are characterized by *sequential interdependence*, as when members of one unit rely upon others having successfully carried out their task in order to complete their own job. The relationship between Research & Development and Marketing in most organizations is sequentially interdependent. Research & Development members must proceed with initial product development *before* marketing personnel have a product to vend. Additionally, unless their product is eventually marketed, Research & Development's ultimate goal is not realized—creating products for consumers. Research & Development groups do not necessarily need to consult with marketing representatives in order to complete their task. Nevertheless, they need to communicate *when* their product can move from development to production. Among other structures, this task is accomplished through planning—setting a projected date for completion. Although dates may be

renegotiated, the nature of their communication still revolves around *plans* for project completion.

Finally, in *reciprocal interdependence* the outputs of each unit become inputs for other units. Sales and Production departments may share a reciprocally interdependent relationship. Sales is dependent upon production in order to have a product to sell, and the adequacy with which sales personnel perform their jobs partially determines whether production will have a steady supply of orders to fill. Because this process is continuous, the nature of the communication patterns is similarly dynamic. Consequently, standardization and planning are ineffective temporal devices to coordinate behaviors. Instead, Thompson suggests coordination by mutual adjustment in these situations, which “involves the transmission of new information during the process of action” (1967, p. 56). The dynamic nature of this relationship has temporal implications as well. In the preceding example both Marketing and Production need to be informed regularly about each other’s actions; online inventory systems may be employed as a means of accomplishing these goals in real time.

Although the relationship between time and coordination is complex, as suggested by these examples, specific relationships have not been explored. Therefore, the following research question is posed.

- RQ1: Is there a relationship between the three types of interdependence/coordination and work group members’ construals and enactments of time?

Workplace Technologies

Although communication research typically has investigated *information* technologies (Fulk & Steinfield, 1990), no doubt because of the use of these technologies as communication tools, this view reflects a narrow conceptualization of the communicative implications of workplace technologies (Rice & Gattiker, 2001). If there is anything that has been made clear in the last decade of communication research on technology, it is that technologies do not exist independent of interaction (Fulk, 1993). Rather it is this interaction vis-à-vis technology that is the central concern of social scientists—engineers and others make the technology their focus. If technologies are socially constructed, and DeSanctis and Poole (1994) have demonstrated that the dimensions and selected features that are appropriated depend on the needs and norms of the group, then it is in those group processes that communication inheres. It is in this sense that workplace technologies are communication-related structures.

Consistent with and extending this perspective, in a collection of ethnographic studies on the structuring of time and technology across organizational groups, Dubinkas (1988a) observes that technologies (ranging from solar energy panels to medical imaging) order interaction. In some cases, “machines are symbols...they are embodiments of times and central social ordering devices for the physicists who build and use them” (p. 28). In other contexts group members “apprehend (the

technology) as an externally created, relatively immutable presence around which work (read interaction) must be organized. The artifact appears to impose temporal order on the users. Technologies in use appear to impose an external temporal order; they structure time” (p. 28).

In this investigation workplace technologies refer not only to information technologies, but also to all physical machines and time-related social technologies (like the assembly line) created by humans to assist task completion. Members’ use of technologies is characterized along two dimensions—the level of constraints on interaction imposed by the technology (low or high) and its task completion interval (brief or extended). Together, these two dimensions distinguish four distinct types of workplace typologies (low constraints–brief task completion, LC-BTC; low constraints–extended task completion, LC-ETC; high constraints–brief task completion, HC-BTC; high constraints–extended task completion, HC-ETC) expected to play a role in shaping members’ experience of time (Ballard & Seibold, 2001). Task completion interval refers to the length of time group members must be engaged with the technology in order to perform a complete task based on the contextual factors involved in the task itself (e.g., coordination requirements with others, waiting time, down time, etc.). Constraints on interaction refer to members’ ability to do other things or complete other tasks while using a given technology.

The role of these two dimensions of organizational technologies comes from McGrath and Kelly’s (1986) model of entrainment. In their model the influence of an external pacer (e.g., technology) in shaping temporal aspects of human interaction is a function of its relative power over the interaction. This power is exerted in two ways: the length of time members must be engaged in the task (i.e., task completion interval), and members’ ability to engage in other tasks simultaneously (i.e., constraints on interaction). Together these two dimensions make up what McGrath and Kelly refer to as the PACE of the technology (1986, pp. 85–88). Technologies are not uniformly appropriated across groups based on some kind of objective, deterministic power (Lewis & Seibold, 1993). Rather, as the interview methodology described later illustrates, technologies should be classified “in use” (Orlikowski, 2000) based upon subjective reports, rather than on superficial, observable characteristics. For example, from a purely structural standpoint, an assembly line may be associated with a brief task completion interval and high constraints on interaction. Members of a particular group may reappropriate this technology, however, in a way that is much less constraining on interaction than is typical in other group contexts (Barley, 1988). Because the impact of these dimensions of workplace technologies on members’ experience of time has not been systematically investigated in previous research, the following research question is posed:

RQ2: Is there a relationship between the four types of workplace technologies and work group members’ construals and enactments of time?

Feedback Cycles

Previous research helps to illustrate the role of feedback cycles in shaping members’

experience of time. Lawrence and Lorsch (1967) studied the time orientation of groups that faced fundamentally different task and temporal constraints on the basis of their membership in one of four departments (sales, production, applied research, and fundamental research) across six organizations in the plastics industry. Findings indicated that members of the sales department had the narrowest temporal perspectives (consistent with a present time perspective) followed by members in the production department. The broadest temporal perspectives (consistent with a future time perspective) were held by members in the departments responsible for fundamental research projects, followed by members of the departments responsible for applied research projects. Similarly, Dubinskas (1988b) discovered related conceptions of time and feedback cycles in a study of scientists and managers in a genetic engineering firm. Company scientists were asked to develop new genetic engineering technologies, a job with extended and highly unpredictable time horizons. In contrast, the job description of the managers at this start-up firm required communicating objective standards of progress and growth to their investors on a much more frequent basis. Dubinskas found that the scientists worked in a future-oriented development time whereas the managers worked in present-centered planning time.

The preceding studies help identify two important temporal aspects of feedback cycles, task variability (low or high) and task completion interval (brief or extended), which informs four distinct types: low variability–brief task completion (LV-BTC), low variability–extended task completion (LV-ETC), high variability–brief task completion (HV-BTC), and high variability–extended task completion (HV-ETC). Task completion interval refers to the amount of time allotted to a given task—be it by a timeline, deadline, policy, or routine. Task variability references the level of uncertainty and unpredictability involved in task execution. It concerns whether the task is mundane and routinized with fairly predictable outcomes or novel and with highly uncertain outcomes. This typology leads to the following research question:

RQ3: Is there a relationship between the four types of feedback cycles and work group members' construals and enactments of time?

Given specific findings from studies by Dubinskas (1988b) and Lawrence and Lorsch (1967), the following hypothesis is posed:

H1: Members of organizational groups characterized by high variability–extended task completion feedback cycles will have a stronger future-time perspective than members whose feedback cycles are characterized by low variability–brief task completion.

Method

Participants

The organization chosen for this study is the subcontractor of a west coast university (WCU) that coordinates and oversees all housing and residential services for its 22,000 students and employees. The focal subcontracting organization of WCU

consists of five departments—Business and Financial Services, Residential Operations, Campus Dining Services, Residential Life, and Apartment and Community Living—ranging in size from 57 to 367 members, each characterized by a unique work environment.

In addition to its functional diversity the WCU organization studied is professionally and demographically diverse. It boasts, and this study included, roughly equivalent numbers of white-collar and blue-collar workers, part-time and full-time employees, women and men, and a wide range of ages and ethnic backgrounds—variables known to be influences on persons' time orientation (Aapola, 2002; Adam, 1995; Ballard & Seibold, 2000; Hall, 1983; Jaques, 1982) and treated in the preliminary analyses in this study as statistical covariates. Additionally, individuals from all four levels (executive, management, supervisory, and front line) of the organization participated. None of the members in these departments were involved in telework arrangements; all respondents were co-located at WCU.

Specifically, the ethnic profile of the participants was 42.6% Caucasian, 27.3% Latino, 10.1% Asian, 8.3% multiracial, 6.2% African American, 1.3% Native American, 1% Arab, and 3.2% were of unspecified descent. The sample included approximately equal numbers of men (52.4%) and women (47.3%). Approximately one-half were older than 30 (up to 70 years old), and the others were in their 20s or late teens. The education levels of the respondents were diverse, including 10% who held a graduate degree, 62.4% with some college education, 24.3% who earned a high school diploma (but did not attend any college), and 3.3% who had not completed high school. The annual household income levels of the respondents varied, with 53.8% earning below \$20,000, 23.4% making between \$20,000 and \$34,999, 12.2% making between \$35,000 and \$49,999, 7.5% earning between \$50,000 and \$75,000, and 3.1% earning more than \$75,000. Respondents had an average of 2 years employment with the organization, a median of 4.8 years tenure, and the longest term was more than 29 years. More than 56% of the participants were full-time employees at WCU, and slightly fewer than 44% were employed part-time. There were also approximately equal numbers of student (48%) and nonstudent (52%) employees.

Data Collection

First, a self-report questionnaire was used to assess members' experience of time along the 11 dimensions. Table 1 reports the Cronbach's alpha for each scale as well as a list of the items (see Ballard and Seibold, 2004, for a more detailed description of these scales). Approximately 70% of the questionnaires were collected during regularly scheduled work group meetings—nearly 30 separate meetings. In addition to being an efficient way to ensure high response rates, it afforded the opportunity for the first author to speak informally with participants (due to the small size and relaxed nature of the work units) and observe them in their work environments. If

a group did not hold regular meetings, then surveys were distributed through immediate supervisors. Ultimately, 393 completed questionnaires were received (75% of those to whom they were distributed). The completed questionnaires were used to determine the number and constituency of work groups. Second, brief interviews were then conducted with each work group supervisor to assess the group's use of specific communication structures. This process is explained next.

Communication Structures

Communication structures represent a team property, or those relatively objective, descriptive, and easily observable features that characterize groups (Klein & Kozlowski, 2000). Consistent with Klein and Kozlowski's recommendations, the structures—coordination methods, workplace technologies, and feedback cycles—were assessed by asking an expert from each work group (supervisors) a series of questions during a personal interview (see Table 2). Results were used to categorize respondents' work environments as representing particular types of interdependence, feedback, and technology. Categorizing individuals into their respective work group is dependent upon the adequate indication of their position or title on a

Table 1 Time Dimensions Scales and Cronbach's Alpha Coefficients (α)

Scale	Items
<i>In my particular line of work, we usually talk about time as...</i>	
Urgency $\alpha = .85$	"Down to the wire" urgent, running out, pressing, an emergency
Scarcity $\alpha = .85$	Scarce, not enough, inadequate, limited, plentiful, abundant
<i>In my particular line of work, we usually talk about our actions or activities as...</i>	
Flexibility $\alpha = .70$	Rigid, fixed, inflexible, set in stone
Separation $\alpha = .56$	In "compartments," separated from each other, divided up
Pace $\alpha = .85$	Rapid, hurried, fast-paced, racing, quick
Punctuality $\alpha = .68$	Punctual, prompt, on time
Delay $\alpha = .75$	Running late, behind schedule, delayed
Scheduling $\alpha = .53$	Accounted for, tightly scheduled
Linearity $\alpha = .66$	Having a specific order, structured, carried out "step-by-step"
<i>In my particular line of work, we usually discuss events that happen at work in terms of...</i>	
Present time perspective $\alpha = .76$	What is urgent today, presently developing issues, the immediate consequences, the here-and-now, what is "pressing," unfolding developments
Future time perspective $\alpha = .87$	Long-term expectations, upcoming activities, projected dates, long-term plans, future developments, anticipated events

Items were rated on a 6-point Likert-type scale ranging from strongly agree to strongly disagree.

Table 2 Questions Asked of Supervisors to Assess Communication Structures
(Supplemented with Qualitative Observation)

<i>Interdependence</i>	
Pooled	<ul style="list-style-type: none"> ■ Does your group work relatively independently from others? ■ Or is your basic work process highly dependent upon another units' or vice versa? ■ Are you able to plan your groups' work and generally stick to those plans despite what other work groups do?
Sequential	<ul style="list-style-type: none"> ■ Does your work group have to wait on others to complete their work before you can finish yours? ■ Or do others depend on you to complete your work before they can complete theirs?
Reciprocal	<ul style="list-style-type: none"> ■ Do you accomplish this primarily through scheduling? (follow up to sequential interdependence) ■ Is this a constant, ongoing process? ■ Is it important for you to adjust or adapt what you are doing based on the other group's performance? ■ Do you need to communicate often with the other group in order to complete your work? ■ Do you often have to change your original plans in the midst of your work based on another group's performance? ■ Is your work guided by more predictable or unpredictable processes?
<i>Technology</i>	
	<ul style="list-style-type: none"> ■ In your unit, what kind of "tools" (procedures—e.g., assembly line—or machines) do you use on a regular basis? ■ Are they used roughly equivalently or are some used more than others? ■ If they are not used equivalently, please rank them in terms of frequency of use. <p style="text-align: center;"><i>The following questions relate to each technology listed.</i></p>
Task completion interval	<ul style="list-style-type: none"> ■ What portion of your work day is spent using this tool in order to complete one task?
Interaction constraints	<ul style="list-style-type: none"> ■ Are you able to engage in other work-related tasks at the same time? ■ Can you do this with relative ease or is it somewhat difficult?
<i>Feedback</i>	
Task completion interval	<ul style="list-style-type: none"> ■ How long does it take before your group knows if a job is well done? ■ Or to finish the job itself?
Task variability	<ul style="list-style-type: none"> ■ How variable is this process (of completing your job or learning of your success with it)? ■ How predictable are the outcomes associated with your work?

completed questionnaire. In some cases this information was missing; in other cases respondents' answers were not descriptive enough to determine the correct work group. In highly heterogeneous work groups, in which various members perform a variety of disparate functions, the entire group could not be characterized in a single way. Of the 393 surveys, 314 (80%) contained sufficient information to classify members into 44 distinct work groups characterized according to their coordination/interdependence, technology, and feedback.

Coordination/Level of Interdependence

Questions assessing levels of interdependence and corresponding coordination methods are itemized in Table 2 along with those for technology and feedback type. Consistent with previous research on coordination mode (van de Ven, Delbecq, & Koenig, 1976) questions were asked in ascending order of coordinative complexity; that is, *pooled* interdependence was evaluated first, followed by *sequential* interdependence, and finally *reciprocal* interdependence. Work groups were then categorized in terms of their interdependence based upon responses to these questions. Regarding the groups' interdependence levels, 17 work groups (122 members; 41%) were classified as pooled, 19 groups (144 members; 48%) were classified as sequential, and 5 groups (34 members; 11%) were classified as reciprocal.

Workplace Technologies

The nature of workplace technologies used by the work groups was first assessed by asking each supervisor to describe all of the technologies used on a regular basis, to rank their frequency of use, and then to respond to a series of questions concerning each technology. Because none of the groups utilized only one technology, the technologies used most regularly were weighted more heavily in determining a group's technology categorization as high interaction constraints–brief task completion (HC-BTC), high interaction constraints–extended task completion (HC-ETC), or low interaction constraints–brief task completion (LC-BTC) (Ballard & Seibold, 2001). None of the groups primarily used technologies that were characterized by low interaction constraints–extended task completion (LC-ETC). Based on the interviews with workgroup supervisors and on qualitative observations, eight groups (87 members; 29%) were classified as using technologies characterized by high interaction constraints–brief task completion, one group (8 members; 3%) using technologies with high interaction constraints–extended task completion, and 32 groups (203 members; 68%) predominantly using technologies with low interaction constraints–brief task completion. Based on the group sizes, there were not enough individuals to include participants from the HC-ETC group in the comparison procedures. Instead, there were two technology types included in the analysis. Table 2 lists the items used in the interview.

Feedback Cycles

Feedback cycles also were assessed in terms of the levels of task variability and the task completion intervals for the nature of the groups' work. The answers supervisors provided for each question (listed in Table 2) were used to categorize groups into one of four potential feedback types. Based upon their responses and qualitative observations by the first author, 18 groups' (136 members; 43%) feedback environments were classified as having low task variability–brief task completion (LTV-

BTC), one group (with eight members; 3%) was classified as low task variability–extended task completion (LTV-ETC), four groups (47 members; 15%) were classified as high task variability–brief task completion (HTV-BTC), and 18 other groups (121 individuals; 39%) were classified as high task variability–extended task completion (HTV-ETC). Based on these proportions, there were not enough individuals to include participants from the LTV-ETC group in the quantitative analyses, so three types of feedback groups were analyzed.

Results

Preliminary Analyses

Because communication structures vary with particular job types, to avoid systematic error associated with related demographic variables, several demographic issues identified as covariates in the literature were explored. The influence of gender, age, ethnicity, education, and income were assessed through both bivariate correlation (Pearson's and Spearman's procedures) and Chi-square analyses. Ultimately, income was chosen as the single covariate given the interrelationships among many potential covariates, and because it is modestly to moderately associated with certain dimensions of time.²

Primary Analyses

To answer the research questions and hypothesis, ANCOVAs were conducted for each of the dimensions of time (flexibility, linearity, pace, punctuality, delay, scheduling, separation, urgency, scarcity, present time perspective, and future time perspective) with level of interdependence (pooled, sequential, and reciprocal), technology type (high constraints on interaction–brief task completion interval or low constraints on interaction–brief task completion interval), and feedback type (low task variability–brief task completion, high task variability–brief task completion, and high task variability–extended task completion) as independent variables and income as the covariate. Where income failed to demonstrate statistical significance, ANOVAs were used instead, resulting in nine ANOVAs and two ANCOVAs. Bonferroni corrections were used to protect against the risk of Type I error caused by multiple analyses: A significance level of $p \leq .005$ was employed. No statistically significant interactions were found. In most cases, Bonferroni post hoc tests were used to compare group types for the interdependence and feedback variables in the ANOVA analyses. In one case, a Games-Howell post hoc test was used due to unequal variance among groups. Finally, an experiment-wise Bonferroni adjusted mean comparison was used for the ANCOVA (due to the unavailability of post hoc tests with covariate analyses). Interfactor correlations are reported in Table 3. Results associated with each research question (and hypothesis) are reported next.

Table 3 Interfactor Correlations

	1	2	3	4	5	6	7	8	9	10
1 = Urgency	.70									
2 = Scarcity	.64	.46								
3 = Pace	.16	.16	.29							
4 = Punctuality	.55	.45	.42	-.16						
5 = Delay	.18	.22	.13	* -.08	.42					
6 = Scheduling	*.07	*.07	.14	.52	-.11	-.18				
7 = Linearity	.33	.26	.30	.36	.15	* -.03	.28			
8 = Present TP	.32	.22	.25	.43	*.08	* -.03	.29	.66		
9 = Future TP	-.25	-.23	-.29	-.25	-.27	-.17	-.39	* -.07	* -.06	
10 = Flexibility	.33	.38	.43	.27	.39	.32	.23	.27	.20	-.41
11 = Separation										

*Indicates nonsignificant correlations.

Coordination Method/Interdependence

RQ1 asked if there is a relationship between the three types of interdependence/co-ordination and work group members' construals and enactments of time. ANOVA results revealed statistically significant differences in organizational members' punctuality, $F(2, 294) = 12.77$, $p < .001$, $\eta^2 = .08$, pace, $F(2, 294) = 16.29$, $p < .001$, $\eta^2 = .10$, linearity, $F(2, 295) = 12.28$, $p < .001$, $\eta^2 = .08$, flexibility, $F(2, 294) = 6.44$, $p < .002$, $\eta^2 = .04$, and separation, $F(2, 293) = 6.12$, $p < .002$, $\eta^2 = .04$, based on the level of interdependence that characterized their work environments. Members of reciprocally interdependent (punctuality: $M = 4.30$, $SD = 0.85$; pace: $M = 4.03$, $SD = 0.93$) and sequentially interdependent (punctuality: $M = 4.18$, $SD = 1.00$; pace: $M = 3.99$, $SD = 1.0$) groups tended to emphasize punctuality and a fast pace more than those bound by pooled interdependence (punctuality: $M = 3.63$, $SD = 1.01$; pace: $M = 3.43$, $SD = 1.08$). Members of sequentially interdependent groups were more linear ($M = 3.91$, $SD = 0.95$), less flexible ($M = 3.84$, $SD = 1.09$), and reported more separation ($M = 3.52$, $SD = 0.82$) in accomplishing tasks than those bound by pooled interdependence (linear: $M = 3.44$, $SD = 0.91$; flexibility: $M = 4.22$, $SD = 0.82$; separation: $M = 3.28$, $SD = 0.78$).

Workplace Technology

RQ2 asked if there is a relationship between the constraints on interaction and task completion interval that characterize workplace technologies and work group members' construals and enactments of time. The type of technology used by work groups was linked to statistically significant differences in members' linearity, $F(1, 295) = 12.28$, $p < .001$, $\eta^2 = .08$, flexibility, $F(1, 294) = 10.80$, $p < .001$, $\eta^2 = .04$, and their present, $F(1, 289) = 8.06$, $p < .005$, $\eta^2 = .03$, and future time perspectives, $F(1, 296) = 16.37$, $p < .000$, $\eta^2 = .05$. Two kinds of technologies were associated with these effects: those with higher constraints on interaction and a brief task completion interval (HC-BTC) and those imposing lower constraints on interaction and a brief task completion interval (LC-BTC).

Specifically, organizational members using technologies that were more highly constraining tended to be more linear ($M = 3.82$, $SD = 0.88$) in carrying out their tasks than those with fewer constraints ($M = 3.73$, $SD = 0.97$), but also reported exercising more flexibility ($M = 3.07$, $SD = 0.88$) in their time use than those with fewer constraints ($M = 2.97$, $SD = 0.97$). Less constraining technologies were associated with a greater tendency to focus on both present ($M = 4.34$, $SD = 0.75$) and future events ($M = 4.43$, $SD = 0.89$) than more constraining devices (present: $M = 4.04$, $SD = 1.13$; future: $M = 3.94$, $SD = 1.13$).

Feedback Cycle

RQ3 concerned the relationship between the feedback cycle characteristics (task completion interval and task variability) of work group members' tasks and their

construals and enactments of time. Temporal differences among respondents whose work was characterized by varying types of feedback cycles were evidenced through their scarcity, $F(2, 295) = 32.817, p < .001, \eta^2 = .18$, urgency, $F(2, 295) = 5.54, p < .004, \eta^2 = .04$, flexibility, $F(2, 294) = 9.63, p < .001, \eta^2 = .06$, pace, $F(2, 294) = 18.82, p < .000, \eta^2 = .11$, delay, $F(2, 294) = 15.523, p < .001, \eta^2 = .10$, and future time perspective, $F(2, 296) = 16.37, p < .000, \eta^2 = .05$. Specifically, members whose work is characterized by low variability–brief task completion interval ($M = 3.32, SD = 1.17$) spoke of time as less scarce than those with higher variability and either a brief task completion interval ($M = 3.90, SD = 0.88$) or an extended task completion interval ($M = 4.41, SD = 0.92$). Additionally, between these latter two groups, members with more extended task completion intervals described time as significantly more scarce than members with briefer task completion intervals. Organizational members whose work is characterized by high levels of variability and extended task completion exercised significantly less flexibility ($M = 2.77, SD = 0.92$) in their activities than members in groups bound by a brief task completion interval (LV-BTC: $M = 3.09, SD = 1.04$; HV-BTC: $M = 3.37, SD = 0.99$). In contrast, members of work groups whose daily tasks had low variability and a brief task completion interval had a slower pace ($M = 4.43, SD = 0.89$) and were less likely to experience a sense of being delayed ($M = 4.43, SD = 0.89$) in their work than coworkers who experience high levels of variability in their day-to-day tasks (HV-BTC: pace: $M = 4.06, SD = 0.96$; delay: $M = 3.58, SD = 1.07$; HV-ETC: pace: $M = 4.02, SD = 0.91$; delay: $M = 3.49, SD = 0.98$). Finally, as predicted in H1, organizational members whose work was characterized by high levels of variability and extended task completion evidenced a greater future time perspective ($M = 4.57, SD = 0.89$) than individuals whose work is characterized by little variability and a brief task completion interval ($M = 4.01, SD = 1.06$).

Discussion

These findings highlight the relationships between three communication-related structures central to organizational members' work and their experience of time. Ten of eleven temporal dimensions identified in the literature and empirically supported in other studies—flexibility, linearity, pace, punctuality, delay, separation, urgency, scarcity, and future and present time perspectives—demonstrated statistically significant relationships with the coordination, technology, or feedback cycles that structure members' work environments. Each of these relationships is considered in turn, limitations of the study are described, and implications for future research are offered.

Coordination Method/Interdependence Levels

Analyses related to the first research question revealed statistically significant relationships among various types of work group coordination and members' enactments of linearity, punctuality, pace, flexibility, and separation. More specifically,

members of work groups bound by sequential and reciprocal interdependence emphasized punctuality and a fast pace more than members of pooled work environments. Given the importance of time, both as input and outcome, for accomplishing tasks via coordination by mutual adjustment (characteristic of reciprocal interdependence), this finding is consistent with the kinds of task demands members face. For example, one of the most dynamic and temporally complex work groups was the dining commons staff. The members were characterized by tight, reciprocal interdependence—from the cooks, to the bakers, to the dishwashers, to what members called the hotline (persons who actually serve the food). During busy times there is constant, high-paced interaction among these positions—failure to act punctually in any one of these areas will impair the process. In contrast, attending to the front desk at one of the dormitories is not a highly time sensitive task. Although it would likely irritate one's co-workers, the work could still be carried out in the absence of a microlevel time sensitivity.

Group members bound by sequential interdependence also reported enacting time in a more linear, less flexible fashion and with more separation behaviors than those bound by pooled interdependence. This outcome is not surprising, as sequential interdependence is explicitly linear and admits of little flexibility. It is a coordinative process wherein time is enacted as a succession of events, each with finite boundary conditions. This specific succession of events is also what limits members' flexibility and makes interruptions to the process detrimental (thus encouraging separation behaviors). When these observations are coupled with the findings above regarding high levels of pace and punctuality, the relationship between higher levels of interdependence and coordination and members' experience of time is illuminated.

Workplace Technologies

The second research question concerned the relationship between work group members' experience of time and the types of technologies they used. Technologies with higher constraints on interaction and a brief task completion interval (HC-BTC) were compared with those imposing lower constraints on interaction and a brief task completion interval (LC-BTC). Results revealed that organizational members who used technologies that were more highly constraining tended to be more linear and flexible in carrying out their tasks than those with fewer constraints. The type of organizational work and technological environment that fits this characterization (i.e., an externally imposed focus on linearity with the freedom to act flexibly at the macro level) is that of maintenance groups—there were separate staffs for each of the six dormitories and three apartments. Due to the safety factors involved in the technology they used (carpentry tools, drills, and electric saws), their work tends to be constraining. Therefore, a more linear approach to using heavy machinery or even small, but potentially dangerous, equipment is sensible for it requires a kind of singular focus. At the same time, these types of technologies posed few to no constraints in terms of the specific ordering or timing of their tasks. This allowed members inherent flexibility in carrying out their jobs.

Work group members who used less constraining technologies had a greater tendency to focus on both present and future events. This effect was especially strong for members engaged in office work—dominated by the use of calendars, computers, and phones. Research on calendar use and other timekeeping devices provides support for the idea that such technologies help to shape persons' experience of time (Payne, 1993). All members of the professional staff were closely tied to their calendars as a matter of business. For example, exit interviews revealed that all departmental work must be logged onto Outlook (group calendar software) from a networked computer. As new plans and appointments arise members are required to update the group calendar. The calendar is then consulted in scheduling group activities. To facilitate this practice of keeping a tightly monitored schedule, WCU subsidizes the purchase of a calendar—up to \$70 toward a traditional planner or personal digital assistant (PDA) with the option to make payments over time for the additional cost of a PDA. The use of a PDA simplifies the process of keeping Outlook updated (through the syncing function); otherwise, members must remember to keep the calendar updated. This daily focus on calendaring helps to elucidate members' simultaneous concern with both present (i.e., today's calendar of activities and appointments) and future events (i.e., planned activities and appointments).

Feedback Cycles

Analyses relevant to the third question assessed three different kinds of feedback environments: work characterized by high levels of variability and extended task completion (HV-ETC), low variability and a brief task completion interval (LV-BTC), and high variability and a brief task completion interval (HV-BTC). Consistent with H1, members of work groups whose feedback cycles were characterized by an extended task completion interval and high task variability exhibited a more future time perspective than group members whose feedback cycles were characterized by brief intervals and low task variability. This result is consistent with findings from Lawrence and Lorsch's (1967) classic study, and provides evidence that the feedback environment characterizing members' work shapes their sense of time, particularly their orientation toward the future.

Members of work groups whose daily tasks had low variability and a brief task completion interval had a slower pace and were less likely to experience a sense of urgency, scarcity, or being delayed in their work than their co-workers who experienced high levels of variability in their day-to-day tasks. These findings make sense, given that members of many organizational work groups characterized by this type of feedback environment had rather tedious jobs. For example, in the residence halls there were fitness monitors, computer lab monitors, and desk attendants. When their supervisors were supplied with questionnaires, they commented that members would probably be happy to fill them out because they are often quite bored during down times. A slower pace is associated with a lack of urgency and not being delayed in one's work. Additionally, as the task variability of members' feedback cycles increased not only did both groups (with brief and extended task completion

intervals) experience increased pace, delay, urgency, and scarcity, but members' experience of scarcity rose in direction relationship to the duration of their task completion interval. Rather than lengthy "time spans of discretion" (Jaques, 1982) leading to feelings of temporal luxury, both the longer interval and the increased variability of the work are associated with feelings of increased temporal paucity. This is consistent with research regarding managerial and project-based work (Bailyn, 1993; Perlow, 1997).

Finally, organizational members whose work is characterized by high levels of variability and extended task completion (e.g., administrators and resident directors) exercise significantly less flexibility in their activities than members of groups bound by a brief task completion interval (and low or high task variability). Managerial and project-based work is generally associated with high levels of flexibility due to the autonomy that generally accompanies its broader feedback cycles (Starkey, 1989). However, if as the finding regarding scarcity indicates, members feel they do not have enough time to complete their work, then flexibility becomes an elusive notion that is difficult to enact. Bailyn (1993) addresses the often rigid or fixed nature of professorial work in light of the touted flexibility it is said to offer.

Limitations

Two challenges of studying the impact of workplace technologies surfaced during this investigation. The first concerns members' nonexclusive use of any given technology. It is difficult to explore the effects of specific technologies when work groups are not restricted to using one technology in accomplishing their work. When supervisors were asked to indicate which technology they used more than the others, many times they found it difficult to make this judgment. Often their answers were given on the basis of judgments that they used one tool as little as 10% more often than another, such as in the case of office work, where use of the phone and the computer were closely tied. For some, like the maintenance, custodial, and groundskeeping supervisors, it depended on the time of the year or week as to which equipment they were using. In the future, selecting organizations on the basis of groups that demonstrate relative technological exclusivity will assist in testing this specific portion of the model (see Ballard & Seibold, 2001, 2003). Also, a repeated measures design that links temporal experience (as the independent variable) to a variety of different technology types (as the dependent variable) may help to cope with this challenge.

A second challenge in investigating the influence of various kinds of technology is ensuring a technologically heterogeneous sample. Only two of the four types of technologies identified in the typology were found in sufficient numbers at WCU to compare across groups. A better sample for subsequent studies would be to explore a large, traditional manufacturing organization, and compare a variety of line work with several kinds of staff work. Such data would also help to address the problem of technological exclusivity.

Additionally, in future studies each communication structure will be measured on

a continuous, interval level scale. Categorical appraisals of groups' interdependence/coordination, feedback, and technologies used do not capture subtle nuances in the differences within each category. A self-administered instrument designed to evaluate coordination method, feedback environments, and technologies will also allow respondents to provide their personal views of the kinds of structures that enable and constrain their work. Finally, although interdependence and coordination are generally considered to follow one from the other, an explicit measure of coordination may be more useful. In this case accurate assessment of coordination would not be contingent upon organizations' use of an effective coordinating mechanism related to their level of interdependence.

Finally, an important limitation of the present investigation is the reliance on correlational data. The observed correlations might also indicate that temporality shapes the structures that groups employ to manage their work, that the relationship is spurious, or a number of other possibilities. The findings from this initial study inform future causal analyses that will help to clarify the nature of these relationships.

Conclusion

The goal of this investigation was to assess empirically the relationship between time and communication-related organizational structures. The argument is that time is essentially created through communication—not a widespread claim, yet one that is central to understanding temporality. Although it is widely acknowledged that time is a social construction (Hassard, 1996; Schein, 1992), and even that this process occurs through interaction and via the use of symbols (Bruneau, 1996; Landes, 1983; McGrath & Kelly, 1986), the corollary—that communication shares a fundamental relationship with the human experience of time—has not been seriously considered by scholars of time or of communication.

Findings in this study suggest that there is, indeed, a relationship among communication-related structures that guide members' work, such as interdependence level, technology type, and feedback cycle, and these organizational members' experience of time. The relevance of this relationship lies in the importance of time as both a communication and organizational construct. Previous research has shown that members' experience of time at work influences their work performance and their quality of life at home (Friedman & Rosenman, 1974; Hochschild, 1997; Perlow, 1997, 1999, 2001). Given this influence, the subject warrants serious consideration. The present study suggests several additional issues to investigate. First, the various relationships among time and these communication-related organizational structures require further inquiry to determine precisely how they operate. Second, identifying which temporal dimensions tend to be more strongly shaped by agency (such as social norms and conventions) than structure (technical demands of the work)—and their interpenetration—is another important consideration. Relatedly, given that the recursive relationship between members' experience of time and the structures that enable and constrain their work is key to this framework,

additional methods that allow for testing of these relationships is a critical step to be taken. Finally, the exploration of other communication structures and aspects of communication in the workplace that influence and are influenced by members' temporal experience will contribute to the further development and refinement of the framework guiding this investigation (Ballard & Seibold, 2003). This study represents one of the first steps toward a deeper and more complex understanding of the relationships between time and communication.

Notes

- [1] This explication of the temporal dimensions clarifies their analytical and theoretical distinction. Indeed, recent research finds them to be separable and empirically robust (see Ballard & Seibold, 2003b). Of course specific dimensions are more related to some than to others (i.e., punctuality/delay, scarcity/urgency). In these cases it may be useful to suggest the implications of their relationship, especially by crossing them. For example, although high urgency and low scarcity may reflect members' shared construals of a ground-breaking project (that has been allotted sufficient time for completion), low urgency and high scarcity might describe construals of a list of postponed projects that would be nice to complete during a brief spring break. Also, although high urgency and high scarcity may characterize construals surrounding an emergency situation that allows little time for adequate resolution, low urgency and low scarcity might typify conditions of underload and boredom. Similarly, high punctuality and low delay might reflect an overall judgment of being on time in completing responsibilities and making appointments, and low punctuality and high delay may indicate an inability to meet various work-related responsibilities in a timely fashion. In addition to the examples given in text, high punctuality and high delay might mean that members' are keeping up with certain projects and falling behind on others or that, on a particular project, they are progressing slowly on certain tasks but have not compromised their ability to meet a deadline. As well as revealing norms surrounding meeting times, low punctuality and low delay may also point to norms regarding project timelines. For example, a colleague may ask for input on a project within a month's time. Given the group's norms, six weeks is an acceptable timeline—implicitly, one month is mutually understood to be the ideal scenario. So at five weeks time, he does not classify his response as punctual, but not as delayed either. These examples serve to demonstrate the nature of potential interrelationships among these dimensions, but, more broadly, they are matters for development and investigation in the future.
- [2] Respondents' age, education, and income level showed small, but statistically significant, correlations with several temporal dimensions (age: .42–.15; education: .11–.14; income: .36–.12). Eta values demonstrated weak relationships between gender and time orientation ($\eta = .17$ –.38) and ethnicity and time orientation ($\eta = .19$ –.34). Income was highly correlated with age, modestly correlated with ethnicity and education, and not correlated with gender.

References

- Aapola, S. A. (2002). Exploring dimensions of age in young people's lives: A discourse analytical approach. *Time and Society*, *11*, 294–314.
- Adam, B. (1995). *Timewatch: The social analysis of time*. New York: Polity Press.
- Albert, S., & Bell, G. G. (2002). Timing and music. *Academy of Management Review*, *27*, 574–593.
- Ancona, D., & Chong, C. (1996). Entrainment: Pace, cycle and rhythm in organizational behavior.

- In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 1, pp. 251–281). Greenwich, CT: JAI Press.
- Ancona, D. G., Okhuysen, G. A., & Perlow, L. A. (2001). Taking time to integrate temporal research. *Academy of Management Review*, 26, 512–529.
- Bailyn, L. (1993). *Breaking the mold: Women, men and time in the new corporate world*. New York: Free Press.
- Ballard, D. I., & Seibold, D. R. (2000). Time orientation and temporal variation across work groups: Implications for group and organizational communication. *Western Journal of Communication*, 64, 218–242.
- Ballard, D. I., & Seibold, D. R. (2001). *The experience of time at work: The role of organizational communication structures*. Paper presented at the annual meeting of the National Communication Association, Atlanta, GA.
- Ballard, D. I., & Seibold, D. R. (2003). Communicating and organizing in time: A meso-level model of organizational temporality. *Management Communication Quarterly*, 16, 380–415.
- Ballard, D. I., & Seibold, D. R. (2004). Organizational members' communication and temporal experience: Scale development and validation. *Communication Research*, 31(2), 135–172.
- Barkema, H. G., Baum, J. A. C., & Mannix, E. A. (2002). Management challenges in a new time. *Academy of Management Journal*, 45, 916–930.
- Barley, S. R. (1988). On technology, time, and social order: Technically induced change in the temporal organization of radiological work. In F. Dubinskas (Ed.), *Making time: Ethnographies of high-technology organizations* (pp. 123–169). Philadelphia: Temple University Press.
- Blau, G. (1995). Influence of group lateness on individual lateness: A cross-level examination. *Academy of Management Journal*, 38, 1483–1496.
- Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge, UK: Cambridge University Press.
- Bruneau, T. (1996). Subjective time, social interaction, and personal identity. In H. B. Mokros (Ed.), *Interaction and identity: Information and behavior* (Vol. 5, pp. 97–115). New Brunswick, NJ: Transaction Publishers.
- Burleson, B. R. (1992). Taking communication seriously. *Communication Monographs*, 59, 79–86.
- Cusella, L. P. (1987). Feedback, motivation, and performance. In F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), *The handbook of organizational communication* (pp. 624–678). Newbury Park, CA: Sage Publications.
- DeSanctis, G., & Poole, M. S. (1994). Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science*, 5(2), 121–147.
- Dubinskas, F. (1988a). Cultural construction: The many faces of time. In F. Dubinskas (Ed.), *Making time: Ethnographies of high-technology organizations* (pp. 3–38). Philadelphia: Temple University Press.
- Dubinskas, F. (1988b). Janus organizations: Scientists and managers in genetic engineering firms. In F. Dubinskas (Ed.), *Making time: Ethnographies of high-technology organizations* (pp. 170–232). Philadelphia: Temple University Press.
- Durkheim, E. (1915). *The elementary forms of the religious life* (J. W. Swain, Trans.). New York: Free Press.
- Friedman, M., & Rosenman, R. H. (1974). *Type A behavior and your heart*. New York: Knopf.
- Fulk, J. (1993). Social construction of communication technology. *Academy of Management Journal*, 36, 921–950.
- Fulk, J., & Steinfield, C. (Eds.). (1990). *Organizations and communication technology*. Newbury Park, CA: Sage Publications.
- Gastorf, J. W. (1980). Time urgency of the Type-A behavior pattern. *Journal of Consulting and Clinical Psychology*, 48, 299.
- George, J. M., & Jones, G. R. (2000). The role of time in theory and theory building. *Journal of Management*, 26, 657–684.
- Gherardi, S., & Strati, A. (1988). The temporal dimension in organizational studies. *Organization Studies*, 9, 149–164.

- Giddens, A. (1979). *Social theory and modern sociology*. Palo Alto, CA: Stanford University Press.
- Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. Berkeley, CA: University of California Press.
- Hall, E. T. (1983). *The dance of life*. New York: Doubleday.
- Harrison, D. A., Price, K. H., Gavin, J. H., & Florey, A. T. (2002). Time, teams, and task performance: Changing effects of surface- and deep-level diversity on group functioning. *Academy of Management Journal*, *45*, 1029–1045.
- Hassard, J. (1996). Images of time in work and organization. In S. R. Clegg, C. Hardy, & W. R. Nord (Eds.), *Handbook of organization studies* (pp. 581–598). Thousand Oaks, CA: Sage Publications.
- Hochschild, A. R. (1997). *The time bind: When work becomes home and home becomes work*. New York: Henry Holt & Company.
- Huy, Q. N. (2001). Time, temporal capability, and planned change. *Academy of Management Review*, *26*, 601–623.
- Jaques, E. (1982). *The form of time*. London: Heinemann.
- Jones, J. M. (1988). Cultural difference in temporal perspectives: Instrumental and expressive behaviors in time. In J. E. McGrath (Ed.), *The social psychology of time: New perspectives* (pp. 21–38). Newbury Park, CA: Sage Publications.
- Kelly, J. R., Futoran, G. C., & McGrath, J. E. (1990). Capacity and capability: Seven studies of entrainment of task performance rates. *Small Group Research*, *21*, 283–314.
- Kelly, J. R., & McGrath, J. E. (1985). Effects of time limits and task types on task performance and interaction of four-person groups. *Journal of Personality and Social Psychology*, *49*, 395–407.
- Klein, K. J., & Kozlowski, S. W. (2000). From micro to meso: Critical steps in conceptualizing and conducting multilevel research. *Organizational Research Methods*, *3*, 211–236.
- Landes, D. S. (1983). *Revolution in time: Clocks and the making of the modern world*. Cambridge, MA: The Belknap Press of Harvard University Press.
- Lauer, R. H. (1981). *Temporal man: The meaning and uses of social time*. New York: Praeger Publishers.
- Lawrence, P. R., & Lorsch, J. W. (1967). *Organization and environment: Managing differentiation and integration*. Boston: Harvard University Press.
- Lee, H., & Liebenau, J. (1999). Time in organizational studies: Toward a new research direction. *Organization Studies*, *20*, 1035–1058.
- Levine, R. V. (1988). The pace of life across cultures. In J. E. McGrath (Ed.), *The social psychology of time: New perspectives* (pp. 39–60). Newbury Park, CA: Sage Publications.
- Lewis, L. K., & Seibold, D. R. (1993). Innovation modification during intraorganizational adoption. *Academy of Management Review*, *18*, 322–354.
- McGrath, J. E., & Kelly, J. R. (1986). *Time and human interaction: Toward a social psychology of time*. New York: Guilford Press.
- McGrath, J. E., & Rotchford, N. L. (1983). Time and behavior in organizations. *Research in Organizational Behavior*, *5*, 57–101.
- McPhee, R. D., & Zaug, P. (2000, February). *The communicative construction of organizations: A framework for explanation*. Paper presented at the annual meeting of the Western States Communication Association, Sacramento, CA.
- Meuser, K. T., Yarnold, P. R., & Bryant F. B. (1987). Type A behaviour and time urgency: Perception of time adjectives. *British Journal of Medical Psychology*, *60*, 267–269.
- Moore, W. E. (1963). *Man, time and society*. New York: Wiley.
- Mosakowski, E., & Earley, P. C. (2000). A selective review of time assumptions in strategy research. *Academy of Management Review*, *25*, 796–812.
- Nandhakumar, J., & Jones, M. (2001). Accounting for time: Managing time in project-based team-working. *Accounting, Organizations and Society*, *26*, 193–214.
- Orlikowski, W. J. (2000). Using technology and constituting structures: A practice lens for studying technology in organizations. *Organizational Science*, *11*, 404–428.

- Payne, S. J. (1993). Understanding calendar use. *Human-Computer Interaction*, 8, 83-100.
- Perlow, L. A. (1997). *Finding time: How corporations, individuals, and families can benefit from new work practices*. Ithaca, NY: Cornell University Press.
- Perlow, L. A. (1999). The time famine: Toward a sociology of work time. *Administrative Science Quarterly*, 44, 57-81.
- Perlow, L. A. (2001). Time to coordinate: Toward an understanding of work-time standards and norms in a multicountry study of software engineers. *Work and Occupations*, 28, 91-111.
- Rice, R. E., & Gattiker, U. E. (2001). New media and organizational structuring. In F. M. Jablin & L. L. Putnam (Eds.), *The new handbook of organizational communication: Advances in theory, research, and methods* (pp. 544-581). Thousand Oaks, CA: Sage Publications.
- Roy, D. F. (1960). Banana time: Job satisfaction and informal interaction. *Human Organization*, 18, 156-168.
- Schein, E. H. (1992). *Organizational culture and leadership*. San Francisco: Jossey-Bass.
- Seibold, D. R., & Shea, B. C. (2001). Participation and decision making. In F. M. Jablin & L. L. Putnam (Eds.), *The new handbook of organizational communication: Advances in theory, research, and methods* (pp. 664-705). Thousand Oaks, CA: Sage Publications.
- Starkey, K. (1989). Time and work: A psychological perspective. In P. Blyton, J. Hassard, S. Hill, & K. Starkey (Eds.), *Time, work, and organization* (pp. 57-78). New York: Routledge.
- Thompson, J. D. (1967). *Organizations in action*. New York: McGraw-Hill.
- Van de Ven, A. H., Delbecq, A. L., & Koenig, R., Jr. (1976). Determinants of coordination modes within organizations. *American Sociological Review*, 41, 322-338.
- Waller, M. J., Conte, J. M., Gibson, C. B., & Carpenter, M. A. (2001). The effect of individual perceptions of deadlines on team performance. *Academy of Management Review*, 26, 586-600.
- Waller, M. J., Giambatista, R. C., & Zellmer-Bruhn, M. E. (1999). The effects of individual time urgency on group polychronicity. *Journal of Managerial Psychology*, 14, 244-256.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. New York: Cambridge University Press.
- Yakura, E. K. (2002). Charting time: Timelines as temporal boundary objects. *Academy of Management Journal*, 45, 956-970.
- Ylijoki, O.-H., & Mantyla, H. (2003). Conflicting time perspectives in academic work. *Time and Society*, 12, 55-78.
- Zerubavel, E. (1981). *Hidden rhythms: Schedules and calendars in social life*. Chicago: University of Chicago Press.

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