

WORK STRESS AND THE CONTEXT OF TIME:
ANALYZING THE ROLE OF THE RELATIVISTIC
ASPECTS OF TIME

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Abstract

Scholars have generally failed to systematically analyze the important contribution of the subjective aspects of time in the area of work stress. In this paper, we analyze how cultural, organizational and individual factors influence the perception of subjective time, which in turn affects the experience of stress. In addition, we examine the reciprocal relationship between subjective time and stress accounting for reciprocal and spiraling effects over time. By explicitly considering the role of subjective time in stress research, we develop several propositions and discuss recommendations for future research. We then discuss implications for organizational practice in reducing stress, revolving around the manipulation and experience of time.

Keywords: Stress; time; time orientation; time norms.

Work Stress and the Context of Time: Analyzing the Role of Subjective Time

The area of work stress has generated much research over the past decades (e.g., Cooper, Dewe, & O'Driscoll, 2001; Kahn & Byosiene, 1992). A great deal of this research has its foundations in the static *interactional* approach, which focuses on the potential moderating effects of personal and situational variables on the relation between stressors and outcomes. This research has generally failed to systematically explore the underlying psychological mechanisms that determine the interactions among variables (Cooper et al., 2001). To study the pattern of these psychological processes and their dynamic effects on stress and strain, it is necessary to incorporate the context of time (cf. Fried & Slowik, 2004) and explore the dynamics of stress over time.

In contrast, the *transactional* models of stress have incorporated transactional elements in an attempt to understand the dynamic nature of the stress process (see, e.g., Edwards, 1992; Karasek, 1979; Lazarus, 1966; McGrath, 1976; Schuler, 1982). Because they focus on the dynamic processes of stress, these models have incorporated, either explicitly or implicitly, the element of time into their models (cf. Cooper et al., 2001; McGrath & Tschan, 2004). However, these models and related research have focused primarily on how the objective characteristics of time affect people's experience of stress, while neglecting to examine how the experience of stress is affected by the subjective aspects of time (cf. Fried & Slowik, 2004; George & Jones, 2000; McGrath & Tschan, 2004). In this paper, we analyze the role of the subjective elements of time in the dynamics of stress. Specifically, we examine how cultural, organizational, and individual factors relating to subjective time influence the way in which individuals perceive stress. We develop a model to represent the influence of subjective time on stress and we further examine the reciprocal relationship whereby stress may also influence subjective time.

Analyzing the subjective elements of time relative to stress is important because individuals' experience of stress, and subsequent reactions to it, often result from their subjective perceptions of the events associated with stress (cf. Bluedorn, 2002; Fried & Slowik, 2004; McGrath & Tschan, 2004). The objective conditions of job stress are often associated with a combination of demands and time constraints. However, these conditions can only partially explain individuals' experience of stress. Individuals may or may not experience stress associated with certain demands or constraints contingent on: (a) cultural time orientation and cultural norms; (b) organizational time orientation and norms; (c) individual differences such as life cycle, career stage, time orientation, polychronicity, and time urgency. These and other issues associated with subjective elements of time and the experience of stress will be discussed.

In the following section we review the characteristics of two views of time: objective time and subjective time. We then present a brief summary of how the current theories of job stress have incorporated the objective view of time into their premises. This is followed by the development of a model that links a dynamic model of stress to objective and subjective time. We systematically analyze how our understanding of experienced stress would be improved if subjective aspects of time were incorporated into the transactional analysis of stress.

The Construct of Time: Objective versus Subjective Views

There are two perspectives from which the time construct can be understood. The first follows Aristotle, and views time as an objective, physical, and quantifiable entity where all events are arranged along a linear axis of time that is real and independent of perception. The second, espoused by St. Augustine, views time in terms of perception and meaning, such that the present only exists when one can perceive a past and a future (Curtis, 2003). In this view, time is not necessarily linear, one-dimensional, or regular.

These two views dominate the discussion of time: the objective view and the subjective view, respectively. The *objective view*, also known as clock time, views time as linear and continuous (i.e., time advances linearly from past to present to future), homogeneous (each second is like every other second), infinitely divisible, and universal (subject to a single interpretation) (e.g., Bluedorn & Denhardt, 1988; Crossan, Cunha, Vera, & Cunha, 2005). This is the prevailing view in American and Western cultures, in which time is treated as a measurable and scarce resource (McGrath & Rotchford, 1983).

However, a growing number of scholars argue that the objective view of time should be complemented by the *subjective view* (e.g., Ancona, Okhuysen, & Perlow, 2001; Lee & Liebenau, 1999). The subjective view of time suggests that, rather than being abstract and absolute, time involves multiple views of time and multiple streams. It is cyclical and uneven (rather than linear and continuous), heterogeneous (rather than homogeneous), and contextual (i.e., its meaning is relative to the surrounding context) (e.g., Ancona et al., 2001; Jones, 1988; McGrath & Kelly, 1986). Although subjective time may be influenced by aspects of objective time (i.e., perception consistent with reality), subjective time is based on individual perceptions and may have characteristics that do not correspond to the objective time. For example, individuals may perceive time as passing slowly during an experience of “flow”, even when the passage of objective time is unchanged (Csikszentmihalyi, 1990; Mainemelis, 2001). Thus, while subjective time may be related to objective time, it has unique characteristics that objective time may not reveal because subjective time relies on individual perceptions. To gain a complete perspective on the role of time in the stress process, we consider both objective and subjective time.

Existing Views of Stress and Objective Time

As described earlier, there are two main types of stress research: interactional models and transactional models (Cooper et al., 2001). Interactional models propose that the interaction of the environmental stimulus and the individual response is the foundation of stress (Lazarus & Launier, 1978). However, interactional models are static and are silent on the process by which this interaction occurs (Cooper et al., 2001; Lazarus & Launier, 1978) thus overlooking the impact of the repeated interactions between these components.

In contrast, transactional models explicitly address the dynamic stress process through several important assumptions and characteristics (e.g., Kahn & Byosiere, 1992). One basic assumption is that the experience of stress is contingent on continuous interactions between the individuals and their environment (Lazarus, 1966; McGrath, 1976). Accordingly, the experience of stress is grounded in an individual's perception of a mismatch, imbalance, or misfit between the individual and the environment. Thus, an individual appraises organizational demands as either a threat or an opportunity. For example, stress may consist of the appraisal that job demands are perceived to exceed one's abilities (e.g., a threat), and that the consequences of successfully meeting the demands are more desirable than the expected consequences of not meeting the demands (e.g., Lazarus, 1966, 1991). As we review below, the role of time in these transactional models is sometimes implicit and other times explicit.

Implicit incorporation of time in existing stress research. In the transactional models of Lazarus (1966; 1991) and McGrath (1976), the construct of time is implicit in the experience of stress, which is based on a continuous interaction between the individual and the environment. These researchers emphasize sequential primary and secondary appraisals. The primary appraisal focuses on whether the environmental stimulus is a threat or an opportunity. The

secondary appraisal is implicitly future oriented in that individuals consider how to most effectively cope with threatening stimuli. Coping would then follow in objective time after the appraisal that a situation is a threat. Objective time is also implicitly incorporated in Hobfoll's (2001) conservation of resource theory (COR). Hobfoll focuses on the gains and losses of objective resources over time, as well as on the accumulation of resources for future use. Thus, in the passage of objective time, stress occurs if individuals' resources are lost or threatened.

Explicit incorporation of time in existing stress research. In contrast to models which implicitly consider objective time in relation to stress, other models of stress explicitly consider objective time. For example, in their facet model, Beehr and Newman (1978; Beehr, 1998) include time as a critical facet that affects the experience of stress and strain, making the issue of longitudinal research an explicit focus. Furthermore, they emphasize that time is a crucial factor in determining the consequences of stressful events. Acute stress at the wrong time or chronic stress over time could be detrimental to the individual and the organization (Beehr and Newman, 1978). For example, the longer one is exposed to a stressful event (i.e., greater clock time), the stronger the consequences. In this way, duration plays an important role in occupational stress (Beehr, 1998).

As another example of an explicit consideration of objective time, Schuler (1982) provided a framework which specified the short, intermediate, and long term responses to stress, in which each period of stress is measured within clock time. Examples of short-term effects of stress are increased catecholamine, heart rate, and blood pressure, which the body seeks to resist. This process is associated with 'a disease of adaptation' (intermediate responses) in which the immune system becomes vulnerable and conditions such as chest and back pain and migraines become more likely (e.g., Cox, 1978). The long-term effects of job stress include behavioral

indicators such as lower performance, higher absenteeism, and turnover, as well as psychological reactions such as lower satisfaction and exhaustion (e.g., Melamed et al., 2006).

Recently, several writers (see review by McGrath & Tschan, 2004) have attempted to further incorporate the construct of clock time as an integral part of experienced stress. Specifically, McGrath and colleagues (e.g., McGrath & Rotchford, 1983; McGrath & Tschan, 2004; Shupe & McGrath, 1998) suggested that potentially stressful events would contribute to the actual experience of stress, contingent on their duration, rate of occurrence, frequency, periodicity, pattern (e.g., day-work, night work, rotating shifts) and predictability (regular versus irregular). They further suggested that the reallocation of time at work may help alleviate the experience of stress associated with role stressors such as role conflict and overload. Similarly, scholars have recently focused on the contribution of the context of objective time on the effect of stress on mental, physical, and behavioral strain reactions (e.g., Frese & Zapf, 1988; Ganster & Schaubroek, 1991). For example, Frese and Zapf (1988) discussed how exposure to prolonged stress may yield different reactions contingent on the specific source of stress.

While it is important to analyze the contribution of objective time to both: (a) the experience of stress; and (b) the effect of the experience of stress on strain, it is equally important to promote understanding of how the *subjective* aspects of time affect both of these areas. To date, very little research has examined how individuals' subjective perceptions of time may augment or change our views of the experience of stress. We examine how incorporating the subjective approach to time into the area of job stress can improve our knowledge and understanding of the experience of stress at work.

A Model of Stress and Subjective Time

As noted, in contrast to objective time, subjective time allows for multiple views of time,

which are dependent upon several factors. As shown in Figure 1, we focus on how the view of time in one's culture, the view of time in one's organization, and several individual differences collectively influence an individual's subjective experience of time, which, in turn, affects the experience of stress. In addition, we examine the reciprocal relationship between subjective time and experience of stress accounting for reciprocal and spiraling effects over time. We note here that although we discuss cultural and organizational factors, our focus remains at the individual level of analysis: namely, how these factors affect individuals' experience of time, and how the latter, in turn, contributes to perceptions of stress.

Insert Figure 1 about here

Cultural Influences on Subjective Time and Stress

Cultural Time Orientation. Cultures differ in their emphasis on the past, present, and future (e.g., Hall, 1959; Saunders, Van Slyke & Vogel, 2004; Schein, 1992). In some cultures (e.g., Mediterranean, China), people have a view of time that is "circular." Namely, time has the quality of repetitiveness; thus, events repeat themselves. In this view, time does not create pressures for an immediate action because one will have another chance to pass the same path again. Members of such cultures tend to emphasize the past and present, which in turn, reduces the experience of stress associated with time scarcity.

In contrast, other cultures (e.g., North America, Britain) view time more as a straight line. In this linear view, the past has gone, the present is here briefly, and the future is almost upon us, reflecting a strong emphasis on the future (McGrath & Rotchford, 1983). In such cultures, time is a scarce resource that is measured precisely and creates pressure for action. This contributes to

a higher prevalence of stress experience, caused by the pressure to complete tasks within a limited time frame (cf. McGrath & Tschan, 2004). Therefore, we propose:

Proposition 1: People in societal cultures that emphasize circularity of event will tend to perceive less stress when facing work demands than will people in societal cultures that emphasize time as a scarce commodity.

Social norms of time. Because subjective time is contextual, it is therefore related to social norms. For example, scholars have traditionally discussed quantitative role overload as a source of stress caused by a demand to perform more duties than the given objective time will allow (cf. Kahn & Byosiere, 1992). However, researchers have failed to recognize that the experience of role overload may often be related to social norms concerning the amount of time considered sufficient to pursue the required activities (Major, Klein, & Ehrhart, 2002). For example, in research universities in the United States, a teaching load of three or four courses per academic year is considered reasonable in order to provide time to pursue research; higher loads are perceived as a “high” workload. However, in less affluent countries, a reasonable acceptable teaching load may consist of significantly more courses. Thus, faculty members’ experienced overload is affected by the prevailing professional norms concerning what constitutes a high or low workload.

Another example is work-family conflict (WFC). A prominent theme of WFC is time-based conflict, which occurs when the amount of time devoted to one role (e.g. job) makes it difficult to fulfill requirements in the other role (e.g., family) (cf. Greenhaus, Allen, & Foley, 2004). However, the amount of time considered sufficient to dedicate to family may differ, according to prevailing norms. Societies differ in how much value they place on spending time with family, which should affect individuals’ perception of WFC. The appraisal of whether the

amount of time spent with family corresponds to the amount that should be spent, considering dominant cultural values, may be a more important factor in determining WFC (cf. Saunders et al., 2004). Indeed, Greenhaus et al. (2004) found that time-based WFC was more strongly related to subjective balance than objective balance, thus supporting the notion that it is not the actual number of hours one spends in one role that causes WFC, but rather the subjective time balance between work and home. We therefore propose:

Proposition 2: Social norms concerning time will provide the context for employees' evaluation of work demands such that the perception of work overload or work-family conflict will depend upon the prevailing social norms of an acceptable workload and time at work away from home.

Organizational Influences on Subjective Time and Stress

Organizational time orientations. Similar to cultures, organizations differ in their view of the past, present, and future. For example, whether an organization focuses on the past, present, and/or future, will influence the organization's approach to scheduling, synchronization, and time allocation (McGrath & Rotchford, 1983). A consideration of organizational time orientation may help clarify when people are more likely to appraise a situation as a threat versus an opportunity, which are important concepts in the transactional stress literature.

In the current global environment, organizations that are oriented toward the future often emphasize training and development to improve their competitive advantage. For the successful organization, this viewpoint suggests that time is a resource that provides the opportunity to prepare the workforce for future needs. This would be the case, for example, with management trainees who are rotated among different departments every few months for purposes of training and development. During that time period, employees may face job demands for which they are

unprepared; however, they may not experience a high level of stress if their organization recognizes that failures are an integral part of successful learning that can contribute to successful future performance (e.g., Sitkin, 1992). Alternatively, an organization under intense pressure may focus almost exclusively on the present. That is, the problems experienced while trying to remain competitive may prevent the organization from devoting resources to training processes. Thus the demands placed upon the individual are not focused on learning and development for future performance, but rather on current behaviors and immediate performance. Individuals in present oriented organizations may experience these performance demands as a threat compared to individuals in future oriented organizations who may experience demands for performance training as an opportunity.

Organizations may also adopt an approach which balances present and future time orientations. For example, there are occupations in which continual updating of knowledge and skills is important, but personal mistakes during the training period may result in adverse consequences to human lives (e.g., nurses, physicians, pilots). In these occupations, the organization is likely to emphasize both potentially adverse consequences, which are tied to the present, as well as positive developmental consequences, which are tied to the future. As a result, people in these occupations would tend to appraise the demands during the training period as both a threat and an opportunity.

Proposition 3: Organizational time orientation will impact an individual's subjective perception of stress over time such that emphasis on the future will be associated with greater appraisal of opportunities, emphasis on the present will be associated with greater appraisal of threats, and dual emphasis on the present and future will be associated with greater appraisal of simultaneous threats and opportunities.

Organizational norms regarding the “present” versus the “future.” The norms of organizations concerning the definition of time largely determine the subjective definition of “present” versus “future.” In knowledge-based organizations, the developmental transitory “present” tends to be longer, in terms of objective time (Fried & Slowik, 2004). Yet, regardless of the objective time duration, individuals should perceive job demands as challenging during the subjectively defined transitory period, even if they exceed their abilities. Successful knowledge-based organizations encourage employees to engage in novel experimentation, even if this often fails to meet the assigned goals (e.g., McGrath, 1999; Sitkin, 1992). The idea is to encourage employees to fail often in order to succeed sooner. Therefore, the experience of stress during the developmental period is expected to be relatively low, because employees are encouraged to perceive failures as instrumental for future success. During these periods, people would tend to appraise job demands as opportunities rather than threats, because they will perceive the imbalance between demands and capabilities as a temporary state that can serve as the basis for achieving the desired future success (e.g., Fried & Slowik, 2004). During this transitory passing “present,” learning-oriented failures are viewed as events that set the stage for future successes.

However, once the norms dictate that the transitory “passing” period has ended, and the “infinite” future starts, individuals are likely to perceive their lack of ability to cope with these demands as a threat. This is because norms indicate that, during the “infinite” future time they should be successful, whereas failure will be associated with adverse career-related consequences (cf. Fried & Slowik, 2004). Based on this reasoning, we propose:

Proposition 4: The perception of threats versus opportunities will depend upon the prevailing organizational norms of what constitutes the “present” period of learning and

the “future” period of performing.

Organizational norms regarding career trajectory. Organizational norms may also affect whether demanding situations are perceived as presenting opportunities or threats. For example, norms of what constitutes “quick” or “slow” promotion vary depending on the norms of the profession and/or of the particular organization (Hassard, 1996). For example, Lawrence (1984) found that managers who significantly lagged behind the company’s typical career timetable were less satisfied with their career than were their counterparts who were “on time” or “ahead of time”.

Prospect theory (Kahneman & Tversky, 1979) would predict that below-referent employees involved in organizational changes in job design would appraise the ensuing high role ambiguity or overload as opportunities rather than threats, because they provide these undervalued employees a chance to prove their worth and advance their careers (cf. Sitkin & Pablo, 1992). On the other hand, individuals who are progressing at a normal pace or faster according to the organization’s norms would be more likely to perceive the increased role ambiguity and overload as threats, rather than opportunities. This is because a failure to function well under demanding situations may hinder their future opportunities for promotion (cf. Hassard, 1996). Therefore we propose:

Proposition 5: Employees who perceive themselves as being below organizational norms for career trajectories are expected to experience demanding work conditions as opportunities, whereas those who perceive themselves as being above organizational norm are expected to experience such work conditions as threats associated with stress.

Individual Influences on Subjective Time

Life cycle. Shmotkin and Eyal (2003) pointed out that psychological time undergoes

changes throughout the life span. Accordingly, young adults undergo a process of shattering the illusions of the past, while experiencing a future that stretches out infinitely before them, full of promise and the chance of realization of dreams. As such, they may consider work demands as an opportunity to improve their abilities and learn new skills. In contrast, people in the middle stage of life and beyond have longer pasts but anticipated shorter futures than youth. Thus, they may recognize the limitations and uncertainty of the future, in that their futures are potentially negative because their physical and mental capacities are expected to eventually decline (Bortner & Hultsch, 1972). Thus, work demands that challenge one's abilities will be seen as a threat. Given these differences, it can be expected that one's age will affect people's perception work demands as a threat or opportunity, as follows:

Proposition 6: Younger individuals are likely to perceive organizational or work demands as more of an opportunity than a threat, whereas older individuals will perceive similar demands as more of a threat than an opportunity.

Career stage. Career stage may also influence the social meaning of job overload, which would affect employees' perception of whether overload is a threat and/or opportunity. In competitive environments, it is common for employees who advance to key managerial positions to be under constant time pressure, pushed by their employers to work many hours. These managers are likely to perceive such chronic overload as a paradox of both threat and opportunity. It is a potential threat to health, yet also an opportunity because it indicates that their employer trusts them and appreciates their work (cf. Fried & Shirom, 1984; LePine, Podsakoff, & LePine, 2005). Based on the interpretation of overload as a positive sign of being valued, such managers may experience a higher level of stress if their employers suddenly reduced their workload, which might be interpreted as signaling reduced status.

In contrast, in early career stages, when employees are in lower positions, organizational norms often dictate that those with lower seniority work harder compared to their veteran peers. Here, the experience of stress is related not only to the appraised difficulty of meeting the demands, but also to the symbolic meaning of workload as a negative phenomenon associated with lower status during early career stages. We therefore propose:

Proposition 7: Career stage will determine whether demands are perceived as opportunities or threats such that when norms at a particular career stage value the presence of demanding work conditions (e.g., role overload), this demand is likely to be experienced as an opportunity rather than a threat, and vice versa.

Individual time orientation. Although Western societies and organizations generally hold a strong orientation to the present and (especially) the future, there are individual differences in how much individuals focus on the past, present, and/or future (Zimbardo & Boyd, 1999). Individuals with a strong future orientation are more likely to take a long-term career perspective than are their counterparts with lower future orientation. The former would therefore show a higher tendency to be involved in demanding and potentially threatening job demands for a relatively long period of objective (clock) time (cf. Blount & Janicik, 2001; Fried & Slowik, 2004). Their future time orientation leads them to view the demands as a temporary (transitory) step in a developmental process, in which necessary capabilities for future success are acquired (Bluedorn & Denhardt, 1988; Fried & Slowik, 2004). Therefore, individuals having a high future orientation are more likely to appraise demanding situations as opportunities. Moreover, due to their future outlook, they also may be less likely to experience stress due to conditions that contribute to delays, such as role overload and role ambiguity (cf. Blount & Janicik, 2001), because they focus on the longer-term aspects of such situations.

Individuals with a greater present orientation may be more sensitive to their immediate tasks than those with a lower present orientation. In demanding tasks that challenge their abilities, present focused individuals should be more likely to appraise these demands as a threat (cf. Bluedorn & Denhardt, 1988), because they may not be able to perform these tasks presently.

Finally, individuals with a greater past orientation should recall and be more occupied with stressful events that they have experienced previously as compared to those with a low past orientation. As a result, when highly past focused individuals recall events, they might be perceived as more threatening, stressful, and potentially longer-lasting than the objective circumstances would suggest (cf. Blount & Janicik, 2001; Mainemelis, 2001). We therefore propose:

Proposition 8: Individual time orientation is likely to affect individuals' experience of stress, such that demanding tasks may be perceived as opportunities by individuals with a high future orientation but as threats by individuals with a high past orientation or a high present orientation.

Further, the fit between an individual's time orientation and that of his or her team or organization is likely to contribute to one's perception of time and stress. As noted earlier, organizations have different time orientations, which contribute to different norms of what constitutes "quick" or "slow" (Schein, 1992). To illustrate, the normal time horizon for salespeople is typically short-term (e.g., minutes, days, and weeks), while that of scientists is long-term (e.g., years) (e.g., Lawrence & Lorsch, 1967). Thus, the term "soon" has different meanings among salespeople versus scientists, which may contribute to the experience of stress.

The difference in time perspective between individuals and their organizations will likely contribute to employees' appraisal of their work as being associated with threat versus

opportunity (cf. Conte et al., 1995). For example, evidence suggests that in successful knowledge-based organizations, managers have successfully integrated the time perspective of their scientists into their management philosophy and practices (e.g., McGrath, 1999). In such organizations, employees are more likely to focus on the opportunity rather than the threat (cf. McGrath & Tschan, 2004). In contrast, where such integration has not taken place, the distinct and incompatible views of time held by managers and their employees may contribute to an increased likelihood of individuals appraising their work as a threat rather than an opportunity. Consequently, individuals who are judged on the basis of their organizations' views of time may experience stress. Therefore, we propose:

Proposition 9: The fit between the time orientation of an individual and his or her organization will affect the perception of stress such that, the greater the compatibility in time orientation between individuals and their organizations, the greater the likelihood that these employees will perceive their work demands as an opportunity rather than a threat, and vice versa.

Similarly, the growing use of global virtual teams having different time orientations may also affect the experience of threat versus opportunity (cf. Saunders et al., 2004). Multicultural teams involved in joint projects often adhere to different views of time, with important practical implications (cf. Saunders et al., 2004). For example, American teams are likely to adhere to the clock time perspective, while Japanese teams are likely to adhere to a cyclical perspective of time. The two perspectives differ on the key issue of time scarcity. Under the clock time perspective, time is a scarce commodity, whereas under the cyclical perspective, time is recurrent and unlimited, such that there is no waste of time (Saunders et al., 2004). Thus, American team members are likely to hold deadlines in higher regard than their Japanese

counterparts, which may contribute to frustration and conflict between the teams. Therefore, we propose:

Proposition 10: The fit between the time orientation of an individual and his or her global team will affect the perception of stress such that, the greater the compatibility in time orientation between individuals and their global teams, the lower the perception of threat, and vice versa.

Polychronicity. Polychronicity describes an individual's preference for performing multiple tasks simultaneously versus performing one task to completion before starting another (Bluedorn, Kaufman, & Lane, 1992; Slocombe & Bluedorn, 1999). This tendency to "multi-task" may be related to stress in that certain jobs require more multi-tasking than others, and holding a job with a different level of polychronicity than one's preferred style may create a stressful situation (Hecht & Allen, 2005; Slocombe & Bluedorn, 1999). In this case, a monochronic individual whose job requires polychronic sequencing of tasks would likely perceive these demands as threats because monochronic individuals may perceive that there is not enough time to complete the tasks simultaneously. In contrast, a polychronic individual whose job requires monochronic sequencing of tasks would likely perceive these demands as threats because polychronic individuals perceive monochronic tasks as providing less stimulation than they desire. Thus, we propose:

Proposition 11: Polychronicity is likely to affect individuals' experience of stress, such that monochronic tasks will be perceived as threats by highly polychronic individuals, and polychronic tasks will be perceived as threats by highly monochronic individuals.

Time urgency. Time urgency, an aspect of Type A personality, refers to an individual's preoccupation with time, such as time awareness, use of scheduling, and deadline control (Conte,

Mathieu, & Landy, 1998; Landy, Rastegary, Thayer, & Colvin, 1991; Schriber & Gutek, 1987).

These individuals are more inclined to feel time pressure, regardless of the objective work circumstances, resulting in higher levels of experienced stress, relative to their counterparts with a type B personality (cf. Blount & Janicik, 2001). Because highly time urgent individuals perceive time as critical for achieve their goals, they may perceive work demands as more threatening compared to low time urgent individuals because greater demands mean a greater need for accomplishment in what is already perceived as limited time. Thus,

Proposition 12: Time urgency will affect individuals' experience of stress such that highly time urgent individuals will perceive subjective time as more limited than low time urgent individuals, and this perception of time as limited will contribute to a greater perception of demands as threats.

The Reciprocal Relationship between Stress and Time

To this point, we have discussed aspects of cultures, organizations, and individuals related to subjective time that lead to differences in the perception of stress. However, the relationship may also be reciprocal such that the perception of subjective time is also a consequence of stress (cf. Mainemelis, 2001).

Subjective flow of time as a consequence of stress. The concept of time flow (Csikszentmihalyi, 1990; Mainemelis, 2001) views the perception of time as a consequence of stress, such that stressful events can affect the subjective experience of time. For example, when employees are involved in job demands that exceed their resources, time is likely to "stand still" (cf. McGrath & Kelly, 1986). Sports commentators often say of a player who is expected to have a tough time guarding his opponent that this player "will have a long night." In addition, when employees are exposed to work demands that underutilize their abilities, they are likely to

experience a slow passage of time when doing these tasks (“time is hardly moving”). This experience is related to task routinization and the underutilization of abilities, both of which produce the experience of boredom (cf. Hassard, 1996; Lee & Liebenau, 1999).

However, according to Flaherty (1999) and Bluedorn (2002), the discussion of flow of time may be overly simplistic, as there are conditions under which unpleasant experiences may pass quickly, whereas pleasant ones may pass slowly. For example, a ballet dancer whose performance is usually associated with a quick flow of time may also occasionally experience a slow passage of time while performing a difficult turn. According to Flaherty’s theory, the experience of faster or slower pace of time is contingent not on the pleasantness of one’s experience, but rather on the level of cognitive information processing. When people are involved in a high level of cognitive engagement with the self and the situation, especially when this engagement concerns their ability to deal with a difficult challenge, time is experienced as moving slowly. However, if one does not care about one’s ability to overcome difficulties, time is expected to subjectively pass normally.

While Flaherty’s theory and some supportive findings do provide an insightful explanation of the fact that the flow of time may not always be linearly related to the pleasantness or unpleasantness of situations, as a general rule one can argue that in unpleasant situations people will tend to engage in significantly more information processing than they will in pleasant situations (cf. Cohen, 1980). This argument is supported by Frankenhaeuser’s (1959) attentional model suggesting that subjective duration is related to the degree of attention that one devotes to the passage of time itself. Applying this principle to the area of stress, Zakay (1993) proposed that the inducement of a stressful situation tends to make time and the passage of time salient in the mind of the individual. Thus, stressful situations affect the subjective experience of

time because they cause individuals to be aware of and cognitively occupied with the passage of time.

Proposition 13: The perception of subjective time is influenced by the level of cognitive attention in a stressful situation such that time will be perceived as passing more slowly during stressful periods when individuals engage in greater levels of cognitive attention.

Individual time orientation may also affect the pattern in which stress contributes to the passage of time. According to Blount and Janicik (2001), future-oriented individuals may be more likely to experience a faster flow of time under potentially threatening work demands that exceed their abilities than their counterparts with a present time orientation. This is because the former tend to perceive involvement in demanding conditions as transitory in nature and as part of the broader context of their career progression. The latter, on the other hand, tend to consider such demanding conditions as important events in their own right, unrelated to other future events. Thus, present-oriented people are more likely to be cognitively consumed by demanding and potentially threatening work assignments, relative to their counterparts with a future-oriented time perspective. This may also contribute to present-oriented individuals' tendency to experience slower time flow during their involvement with the threatening demands, resulting in a higher experience of stress.

Proposition 14: The perception of subjective time is influenced by individual time orientation such that individuals with a higher future orientation will perceive time as passing more quickly under conditions of threat relative to individuals with a higher present orientation.

Reciprocal relation between subjective flow of time and stress. Given the above rationale that subjective time leads to the perception of stress and vice versa, the most viable

analysis of the relation between stress and time flow is the reciprocal one (cf. Bond & Feather, 1988; Zellmer-Bruhn, et al., 2001). Earlier, we presented the idea that individuals who are exposed to work demands that underutilize their abilities tend to experience a slow passage of time. This also means that during that time, the experience of stress is exacerbated by the subjective experience that time is hardly moving. This reciprocal relationship may continue to spiral such that over time, the mental task of coping with the stressful event while simultaneously being occupied with the passage of time will result in a growing psychological burden (Csikszentmihalyi, 1990; Kahneman, 1973). The effort spent managing this competition for limited attentional resources can lead the experience of stress to escalate over time (e.g., Cohen, 1980; Fried, Melamed, & Ben-David, 2002). We propose:

Proposition 15: The relation between stress and time flow is reciprocal. While stress is expected to affect the perception of the flow of time, the latter in turn is expected to affect the experience of stress such that a spiraling relationship may occur over time.

Past Stress, Anticipated Stress, and Repeated Events

Past Stress and Anticipated stress. In addition to current stress, past stress and anticipated stress are also likely to be related to subjective time. As noted earlier, past stress may have lasting effects on the subjective passage of time, particularly for those who focus on the past (Blount & Janicik, 2001; Mainemelis, 2001). Similarly, anticipated stress may impact individuals' current perceptions of time. For example, organizations that adopt a plan of downsizing often announce later the specific names of those who will be laid off. For employees who suspect that they will be laid off, time before the announcement is likely to flow fast, and thus exacerbate anxiety and stress caused by their expectation of being laid off (cf. Csikszentmihalyi, 1990; Mainemelis, 2001). Here, the experience of stress is exacerbated by the

individual psychological experience that his/her termination is around the corner, regardless of how much time actually remains before the organizational decision about termination is made (cf. Zakay, 1993). This, in turn, will exacerbate the experience of stress caused by the anticipation of job loss (Mainemelis, 2001).

On the other hand, employees who do not believe they will be terminated and search for confirmation about their employment status will be eager to receive a formal note about their employment as soon as possible. These individuals are likely to experience the time flow prior to the organizational announcement as slow. This experience of the slow passage of time during that period can be expected to further exacerbate their experience of stress caused by the objective situation of job insecurity, by prolonging the subjective experience of stress (cf. Csikszentmihalyi, 1990; Mainemelis, 2001). We therefore propose:

Proposition 16: The recollection or anticipation of a particular stressor affects the subjective flow of time as either fast or slow; and this time flow is further expected to affect the mental experience of stress associated with the stressor.

Repeated events and stress. As described earlier in the subjective view of time, events are often *cyclical* (repetitive) in nature such that past stressors can be expected to recur (Clark, 1985; Nowotny, 1992). For example, the busiest time for accountants is during the months prior to the tax return deadline (Beehr, 1998). Other work and life activities are planned around this key cyclical work event of serving customers during the tax return season. The cyclical events create expectations that affect the subjective feelings of these individuals, such that weekend days “feel” different from the working days; or working days that tend to be particularly busy “feel” different than days with less work (e.g., the end of the week) (e.g., McGrath & Rotchford, 1983).

The cyclical nature of time and its effect on the subjective experience of time may be also relevant to the experience of stress. Using the classical conditioning framework (e.g., Estes & Skinner, 1941), the anticipation of a periodically repetitive stressful event (e.g., a weekly meeting with a disgruntled boss) may lead to the experience of stress before the actual stressful event occurs, creating anticipatory stress. The stress-inducing event can take on the characteristics of a conditioned stimulus, creating anticipatory stress proportional to the strength of its association with the specific stress it has generated for the individual in past experiences. In classical conditioning terms, the actual event is an unconditioned stimulus, and its recalled, cognitive representation is the conditioned stimulus. Thus, the stress response at the meeting is the unconditioned response and the anticipatory stress is the conditioned response.

The classical conditioning framework also allows us to predict two important features of the experience of stress that relate to the issue of time. First, the more often the individual has experienced stress at past meetings, the stronger the feelings of anticipatory stress should be (cf. Shupe & McGrath, 1988). Second, as the meeting time approaches within the individual's time horizon, the higher the stress response will be. That is, as the time of the anticipated event approaches, people are likely to experience an impending sense of stress, associated with difficulty in pursuing their tasks, even if these tasks are relatively routine and non-threatening.

Proposition 17: The relationship between subjective time and anticipated stress depends upon the history of related stress events such that, subjective time will relate more strongly to anticipated stress when the stressful event was previously experienced in the past.

However, one important distinction in the context of cyclical events is whether the time interval of the repeated events is predictable or not (e.g., McGrath & Beehr, 1990). Based on

reinforcement theory (e.g., Skinner, 1984) and the control literature (e.g., Ganster & Schaubroeck, 1991; Keinan, 1987), it can be expected that when the time interval between events is not fixed (the meetings with the supervisor vary in number of times during the months and particular days), employees will be consumed by the expected stressful event almost all the time because they do not know when to expect the next event. Given the additional cognitive demands, they will be more likely to experience time at work as passing slowly. This experience of slow passage of time is further likely to exacerbate the feeling of stress caused by the unpredictability of the disgruntled supervisor's next visit (cf. McGrath & Tschan, 2004). On the other hand, when time intervals are fixed (e.g., meetings with supervisors are bi-weekly and held on the same day of the week), individuals may have more opportunity to prepare for the stressful event, and thus be less consumed psychologically by the passage of time (cf. McGrath & Tschan, 2004). We therefore propose:

Proposition 18: When intervals between repeated stressful events are unpredictable, the experience of the passage of time will be slow, which further exacerbates the experienced stress.

Non-repeated events and one-trial learning. Despite the cyclical nature of many work activities, other activities are particularly stressful because they occur infrequently and the likelihood of the events repeating themselves is objectively low. The traumatic nature of the event, which can be experienced either personally, or vicariously, through the observed experience of a colleague, creates an unusually persistent relationship between the circumstances and the stress response. This relationship is expected to persist over time because its uniqueness makes unlearning it difficult (cf. Guthrie, 1935, 1942). For example, employees who experience the trauma of unemployment and remain unemployed for a long period of time are likely to

remember this experience as though it happened yesterday, even though chronologically it may have happened years ago (e.g., Cohen, 1980). This psychological trauma remains so fresh in their minds, it may also contribute to the experience of stress at later times when the objective level of stress is low (e.g., when job security is relatively good). Thus,

Proposition 19: Events which are unlikely to repeat over time will be particularly stressful and will impact perceptions of stress in the future.

Discussion

The previous discussion suggests that the subjective elements of time are important contributors to individual experience of stress and stress in turn may impact the subjective perception of time. Our model demonstrates that three categories of influences on subjective time are critical: cultural, organizational, and individual influences. These factors shape the way individuals perceive time and thus interpret stressful conditions. As we have described, cultural and organizational views of time and norms regarding time impact the degree to which individuals interpret stressors as threats or opportunities. Thus, stress research that overlooks the impact of the subjective perception of time may make incorrect predictions because they miss the role of subjective time. Several individual factors also were proposed to influence how individuals perceive time, suggesting that the perception of a stressor as a threat or a challenge is a complex evaluation that may differ from person to person. Thus, as stress researchers expand their ideas to incorporate time, they must consider not just objective time, but also subjective time and its many influences.

In addition to cultural, organizational, and individual influences on the perception of subjective time and stress, our model also demonstrated that the relationship between subjective time and stress is reciprocal. We argued that the perception of time leads to different perceptions

of stress, but these perceptions of stress are also likely to influence one's perceptions of subjective time. The temporal ordering of these experiences is not conclusive, and it might be a spiral relationship. Reciprocal or spiral relationships can be challenging for researchers because they require strong theory to determine which cause is primary and what is the appropriate temporal lag. A call for longitudinal research with time-related topics is common, but in the case of reciprocal causation, longitudinal research is absolutely necessary to gauge these bidirectional effects (e.g., Mitchell & James, 2001). Thus, stress researchers must consider that single measures of subjective perceptions of time and stress, even if they are separated in time, will be insufficient to determine, potentially, which cause is primary and which relationship is stronger.

Future Research

Given the propositions we have set forth, future research could proceed in a number of directions. Given the potential for fit between an individual's time orientation and that of his or her team or organization, researchers may consider the potential for competing levels of fit and misfit. For example, an American citizen hired in an American organization may fit the dominant organizational and cultural time orientation. However, if this individual is a member of a global team that includes diverse individuals with different time orientations, the fit with one's team may be more of a challenge. Which level of time orientation fit may predominate or whether the co-existence of various levels of fit would be stressful or complementary is an empirical question.

Researchers may also consider the interactions between objective time and subjective time. For example, it is possible that subjective time flow under different stressful events may depend upon the objective duration, rate, or frequency of individuals' experience of stress. Moreover, it would be useful to examine how objective temporal characteristics of potentially

stressful events (e.g., cyclical vs. non-cyclical; predictable vs. non-predictable; past events versus anticipated events) are likely to affect the subjective experience of time flow, and as a result the degree to which stress is experienced or intensified.

Future research may also examine how subjective elements of time are related to individuals' coping strategies (cf. Aspinwall & Taylor, 1997; Folkman & Moskowitz, 2000). For example future-oriented individuals may be more inclined to engage in proactive coping (e.g., building up resources that facilitate attainment of challenging goals), relative to present- or past-oriented individuals.

Similarly, it would be useful to analyze how the incorporation of subjective elements of time enhances our understanding of the mitigating effect of different coping mechanisms on strain reactions. There is growing interest in the literature on how respite helps individuals cope with stress (e.g., Eden, 2001; Mitchell, Thompson, Paterson, & Cronk, 1997; Westman & Eden, 1997). Eden (2001) maintained that what we experience during the respite vanishes and is replaced by our memory of it. The experience comes and goes quickly, but the memory lives on in our minds, sometimes for extended periods of time. This continued positive memory may help individuals to better cope with stress during the present. Consistent with the subjective time literature, it may also be that individuals with past orientation are likely to recall these positive events more often and for a longer period of time, which in turn helps them (relative to individuals with future orientation) to better cope with stressful work events during the present. The picture, however, may be more complex, because past-oriented individuals may also be more likely to recall past negative experiences, which may reduce the effectiveness of past recollection of positive events to alleviate stress experiences at present. Future research should attempt to shed light on these issues.

Another important issue that should be further explored is time management, which is believed to decrease stress and strain. Time management behaviors have beneficial effects by giving individuals the perception that they have control over their time (Macan, 1994; Spector, 1998). However, if individuals' subjective view of time leads them to believe that their time is passing too quickly or that a stressor is a threat rather than an opportunity, they may manage their time differently, or potentially abandon all efforts at time management. Future studies should explore how time management relates to the subjective experience of time with the distinct possibility that a reciprocal relationship may exist between these variables as well.

Practical Implications

Perhaps the most practical implication of our propositions is that managers should consider whether an individual's level of time orientation, polychronicity, time urgency or career cycle is likely to fit the temporal demands of the job. As we have shown, these characteristics are likely to shape how individuals interpret stressful situations. Managers may also consider what type of training could help their employees to understand work demands. For example, in the case of global teams, managers may want to create awareness of the differences in time orientation of the team members and to develop team norms on time-related issues (Saunders et al., 2004). Further, managers may be able to reduce the experience of stress by attempting to affect the subjective experience of time during the period employees are exposed to potentially stressful events. For example, the tendency of employees to experience flow when dealing with mentally positive situations may suggest that one way organizations can reduce, at least to some degree, the effect of stressful events on employee reactions is by engaging employees with cognitively challenging tasks during that period.

Managers may also help reduce employees' experience of stress by organizing regular

meetings that would enable employees to plan for these predictable, repeated events. In addition, organizations and employees may alleviate negative mental experiences at work by arranging the objective work time into smaller meaningful events, which will affect subjective flow of time (e.g., Hassard, 1996; Lee & Liebenau, 1999). For example, Roy (1960) demonstrated that employees who were involved in boring, monotonous jobs six days a week, made their work day bearable by dividing it into a series of regular enjoyable social activities, with particular names (peach time, window time, pick up time, fish time, and Coke time) that reflect the type of activities in each event. Thus, they effectively sped up the flow of time during a long day of involvement in boring, unpleasant work (see also Hassard, 1996; Lee & Liebenau, 1999).

Organizations may also reduce employees' experience of stress by establishing and facilitating time norms for career progression. For example, organizations may consider extending the time that is considered acceptable for learning and implementing new skills. During this extended time period of learning, failures would be considered as part of the learning process. This would reduce employees' experience of stress by enabling them to concentrate on the learning process without being distracted by fear of failure. In sum, the norms of time constructed by the organization can help determine when employees who are engaged with potentially stressful events would perceive them as a threat versus an opportunity. These are only a few examples of how manipulation of the subjective elements of time may help employees reduce the experience of stress and strain.

With regard to anticipatory stress, cognitive re-assessment of the stressful event, within the view of subjective time, may enable employees to reduce their stress response (cf. Meichenbaum, 1977). The firefighters and others who experience trauma as part of their job could follow a subjective time restructuring strategy as part of their training and socialization to

reduce their stress experience. In the case of an emergency technician, restructuring could encourage the employee to focus on, for example, reappraising a victim's injuries in terms of saving the life, a long-term perspective, rather than in terms of the injuries sustained, a short-term perspective. This long-term time perspective of injuries can be maintained in the mind of the emergency technician regardless of the actual expected recovery time from the injury. This is because of the adaptation of the relativistic approach to time, under which the injury time is perceived as temporary in nature, while the expected longevity of life following the recovery is perceived as "infinite" in nature (cf. Jaques, 1982; McGrath & Rotchford, 1983).

Finally, we recommend that managers particularly watch for the reciprocal relationship between subjective perceptions of time and stress. These time-stress spirals may exacerbate the effects of a stressor such that, without intervention, an individual is likely to experience greater strain and risk long-term consequences (e.g., burnout or turnover). Helping individuals to manage their subjective perceptions of time in relation to stress and intervening when individuals are caught in a negative spiral may benefit individual well-being in the long-term.

Conclusion

In the present paper, we have demonstrated how the experience of work stress is related to various aspects of the subjective (relativistic) elements of time. We hope that our theoretical analysis will serve as the basis for future research, aiming to enhance our understanding of the contribution of time to the experience and effects of work stress.

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Figure 1. A Model of Stress in the Context of Objective and Subjective Time

