COGNITIVE ACTIVATION THEORY OF STRESS:
AN INTEGRATIVE THEORETICAL APPROACH TO WORK STRESS

JAMES A. MEURS
SCHOOL OF BUSINESS ADMINISTRATION
UNIVERSITY OF MISSISSIPPI
UNIVERSITY, MS 38677
JMEURS@BUS.OLEMISS.EDU

PAMELA L. PERREWÉ
COLLEGE OF BUSINESS
FLORIDA STATE UNIVERSITY
TALLAHASSEE, FL 32306
PPERREWE@COB.FSU.EDU
ABSTRACT

Workplace stress consistently has received a substantial amount of attention from practitioners and researchers alike. Many occupational health scholars have developed or contributed to our understanding of models detailing theoretical approaches to an individual’s experience of stress. Although these theories have improved our understanding of occupational stress, these conceptualizations of stress and much of the subsequent stress research based on these models have been limited in their ability to fully explain individual experience. We suggest that organizational stress research could benefit from an integrative approach that seeks to incorporate both the positive as well as the more traditional negative aspects of the stress experience. We contend that organizational stress researchers should look to a recently elaborated stress theory developed outside of the organizational sciences (i.e., Cognitive Activation Theory of Stress) to provide the theoretical framing necessary for such research. We discuss the implications of integrating this theory into the organizational sciences and provide several avenues for future occupational stress research based on this new conceptualization.
COGNITIVE ACTIVATION THEORY OF STRESS:
AN INTEGRATIVE THEORETICAL APPROACH TO WORK STRESS

Over the course of several decades, occupational stress research has emerged into a prominent field in the organizational sciences. A recent 15-year review of occupational health psychology research in three major journals, by Macik-Frey, Quick, and Nelson (2007), indicated that the stress perspective dominates the field. Based upon the early theorizing and empirical testing of a few prominent stress scholars (e.g., Cannon, 1932; Elliott & Eisdorfer, 1982; Selye, 1951-1956, 1955, 1974), researchers have proposed various models in an attempt to explain the stress experiences of individuals (e.g., Hobfoll, 1989; Karasek, 1979; Lazarus, 1966; Siegrist, 1996).

Early stress researchers argued that stressful experiences did not necessarily demonstrate a damaging effect on the individual. Cannon (1932) suggested that initial or low levels of stressors could be endured, but that prolonged or severe stressors resulted in biological breakdown. Selye (1955) articulated the stress experience as a process of adaptation, arguing for what he termed the general adaptation syndrome. According to Selye, the stages of the stress process progressed from an alarm reaction to the situation, to resistance to the stressor, to exhaustion. Selye (1955) argued that stress was an important part of life and elaborate that stress is not necessarily negative and, thus, an experience to be avoided (1974). Instead, some stressful experiences (i.e., eustress) can be associated with positive feelings and health. However, the most prominent occupational stress theories developed since that time focus predominantly on the negative consequences of stressors.

In our zeal to find the “problems” of workplaces or individuals, stress researchers largely neglected to consider the adaptive effects of stress. This conclusion is strikingly similar to
Seligman and Csikszentmihalyi’s (2000) contention that for too many years psychology had highlighted the “negatives”, resulting in their call for research into positive psychology. In the same way that researchers in the psychology field have sought to heal damaged people and, thus, ignored the characteristics of life that result in flourishing (Seligman & Csikszentmihalyi, 2000), so too until recently have most stress theorists and researchers neglected the aspects of stress that can lead to individual growth.

If stress is a necessary and potentially positive aspect of life, then stress research should consider what aspects of stressful experiences help to make life worth living. We argue that, unfortunately, stress researchers have focused their attention predominately on the downsides of workplace stressors. This concentration on the negative is understandable, given the high cost of overwhelming stress to both the individual and the organization (Macik-Frey, Quick, Quick, & Nelson, 2009).

However, over a decade ago, Ryff and Singer (1998) argued that stress researchers and health professionals tend to define health and well-being as the absence of negative states rather than the presence of positive states. Further, there has been a recent call for occupational health and stress researchers to place a greater emphasis on the factors that exhibit a positive effect on health and psychological well-being (Macik-Frey, et al., 2007; Macik-Frey, et al., 2009). Psychological well-being encompasses a number of factors including autonomy, personal growth, mastery, purpose in life, self-acceptance, efficacy, hope, optimism, and resilience (Avey, Luthans, Smith, & Palmer, 2010; Ryff, Singer, & Love, 2004). Clearly, this is more than simply the absence of negative states.

We propose that organizational scholars incorporate into our research, a theory of individual stress, the Cognitive Activation Theory of Stress (CATS; Ursin & Eriksen, 2004),
which can account for the adaptive aspects and results of workplace stress. We are not suggesting that the adaptive nature of stress is a new discovery; much empirical research recently has been conducted concerning the “positives” (i.e., health and well-being) of the stress experience. Instead, we believe that this research supports the integration of previous models of occupational stress with CATS to provide a more complete picture of the adaptive characteristics of stressful experiences.

In addition, CATS also can shed light on two other important issues, namely, the role of time and past experiences in the processing of stressful encounters, and how the expected outcome(s) of a stressful situation drives one’s response to stressors. In the sections that follow, we examine the more prominent occupational stress theories and suggest that current approaches are based, in large part, on balanced models of stress, which provide insufficient explanations for these important issues. Next, we introduce CATS, which is a theory that has been developed within the physiological health literature. We integrate this new (i.e., to the organizational sciences) theory with occupational stress theories, and discuss how, by incorporating this new theory, we can advance our understanding of the stress experience in the aforementioned three specific ways. Finally, we conclude with a brief discussion of the directions that this new framework allows for stress researchers.

INFLUENTIAL THEORIES OF OCCUPATIONAL STRESS

It is a sign of confusion in stress research that our primary term (i.e., stress) has been conceptualized as the independent variable, the dependent variable, and the process itself (Cooper, Dewe, & O'Driscoll, 2001), and Hobfoll (1989) detailed how researchers have differed regarding their conceptualizations of stress. However, a widely adopted view of stress considers it to be the experienced condition or feeling when individuals perceive that the demands of a
situation exceed their perceived resources and endanger well-being (Lazarus, 1966, 1999; Lazarus & Folkman, 1984). Hence, stress has been thought of as an imbalance between the demands of a situation and the resources available to deal with these demands. This traditional definition seems to have found a consensus of support because it recognizes that stress emerges from the relationship between the person and the environment and it focuses researchers on the process between the two (Cooper, et al., 2001). But, as noted below, this definition of stress restricts it to a situation where strain and/or other negative outcomes are the result, and, thus, does not allow for a consideration of the adaptive or functional aspects of experienced stress.

In this section, we review some of the most prominent work stress theories in the field of organizational behavior and occupational health psychology. We suggest that most of our current approaches to studying occupational stress have been based upon what we have termed balance models. However, we believe that the idea of balance is ill-defined and cannot fully explain the adaptive nature of stressful experiences. We briefly discuss four popular approaches to the study of occupational stress; Lazarus (1991) Transactional Model, Hobfoll’s (1989) Conservation of Resources Theory, the model of Effort-Reward Imbalance by Siegrist (2001), and the Demands-Control model of job stress by Karasek (1979) and colleagues (Karasek & Theorell, 1990).

Based upon Lazarus’ (1991) belief in the primacy of cognition, the transactional model of stress posits that two processes (i.e., cognitive appraisal and coping) mediate between environmental stressors and resulting responses. Stress scholars have continued to use Lazarus’ transactional model as their theoretical foundation in empirical studies (e.g., Dewe, Cox, & Ferguson, 1993; van Steenbergen, Ellemers, Haslam, & Urlings, 2008). According to the model, an event in the work environment engages the cognitive appraisal process, or primary appraisal. This consists of an evaluation of whether the event is a threat to the individual’s well-being, or
whether it can be dismissed as benign or perhaps challenging. If the individual perceives a threat to well-being, the secondary appraisal process is engaged to determine if anything can be done to handle the situation. In this secondary appraisal stage, individuals are said to evaluate their available options for coping with the stressor. The transactional model suggests that an imbalance of greater environmental demands than resources to cope with these demands produces strain.

According to Hobfoll’s (1989) Conservation of Resources Theory (COR), resources are the objects (e.g., home, vehicles), energies (e.g., money, time, credit), personal characteristics (e.g., self-esteem, mastery), and conditions (e.g., socioeconomic status, valued work role) that are valued by individuals. Stress is said to result from an actual or threatened net loss of resources, or from a lack of resource gain following the investment of resources. According to Schaufeli and Bakker (2004, p.296), a resource represents “physical, psychological, social, or organizational aspects of the job” that serve multiple purposes—one of which is to offset the effects of job demands. Theory and empirical work suggest that the effects of stressful situations may be buffered or attenuated if individuals perceive they possess the resources necessary to cope with the stressor (Hochwarter, Perrewé, Meurs, & Kacmar, 2007). Similar to the transactional model, COR theory implies that an imbalance of greater environmental demands than resources produces strain.

The model of Effort-Reward Imbalance (ERI) at work is derived from a more general approach toward analyzing the psychosocial dimension of human health and well-being. Siegrist (2001) proposed that personal self-regulation is important for health and well-being in adult life and that this is largely contingent on successful social exchange. The ERI approach focuses on individual appraisals of social reciprocity and social exchange, characterized by mutual
cooperative investments based on the norm of return expectancy where efforts are balanced by respective rewards. Failed reciprocity violates this norm and leads to strong negative emotions and sustained strain responses because it threatens the fundamental reciprocity/exchange principle. Further, the ERI model suggests that failed reciprocity (i.e., high efforts spent and low rewards received in turn) is likely to elicit recurrent negative emotions and sustained stress responses in exposed individuals. Although positive emotions evoked by appropriate social rewards and exchanges is argued to promote well being, health, and survival, the primary focus of research on ERI has been on the appraisal of failed reciprocity and sustained strain (e.g., Preckel, Meinel, Kudielka, Haug, & Fischer, 2007; Siegrist, 1996). In the Effort-Reward model, imbalance occurs when one receives fewer rewards than is believed to be deserved (Siegrist, 1996).

Finally, the Demands-Control (DC) model of job stress was introduced by Karasek (1979) about 30 years ago, and has played a dominant role in shaping the research agenda in the field of work stress and health. Control (i.e., decision latitude) includes both the worker’s authority to make decisions and the breadth of skills that are employed (Karasek, 1979; Verhoeven, Maes, Kraaij, & Joekes, 2003). Karasek (1979) argued that in jobs with high control, workers experience low strain if they have low demands, whereas they play an active or learning role if they have a job with high demands. Demands are considered an appraisal of the work situation and are primarily psychological in nature (Daniels, Beesley, Cheyne, & Wilmarisiri, 2008). Alternatively, workers with low control have passive jobs if they have low demands, but experience high strain if high demands are made of them. Control can be viewed as a type of resource for individuals such that they perceive themselves as having the necessary tools to effectively deal with the demands at work. Although there has been some support for the DC
In an update to the original model, Karasek and Theorell (1990) proposed that the DC model add the component of social support as another critical resource in determining responses to job demands. A number of researchers have tested the role of social support in the demand-control model finding stress-reducing effects (e.g., Karasek, 1990; Kristensen, 1995). However, although the demands-control-social support conceptualization has demonstrated relationships with strain outcomes, only modest support has been found for the buffering effect of control; that is, at most demonstrating that in order for control to have a buffering effect, it needs to be matched with the types of demands placed on the individual (Jonge & Dormann, 2006; Van der Doef & Maes, 1998, 1999).

We suggest that balance models do not fully explain how experiencing stress can be functional, nor do they address the experience of stress when resources exceed (or meet) the demands encountered. For example, it can be inferred from Karasek’s (1979) model that balance is achieved when both demands and control are low or high. But, according to the model, when both are low, the individual is in a position of passivity, whereas, when both are high, a person is in a more active role. Certainly, while both of these situations achieve balance, the distinction between passive and active roles suggests different outcomes for the individual and different processes leading to these outcomes. However, these differences are not entirely elaborated in this model.

In addition, although containing an active or learning situation (i.e., high control and high demands), the focus of the Demands-Control model is on lessening strain rather than increasing learning or activity. Within the Karasek (1979; Karasek & Theorell, 1990) model, the learning or
active role is engaged only if control and/or support are also present at sufficient levels. The implication is that if this is not the case, strain is experienced. In other words, it could have been proposed that demands lead to activity or learning except when something (e.g., lack of control or support) changes that relationship to cause strain. However, the framing of the model places the emphasis on mitigating strain rather than promoting learning or activity. This distinction may seem to be merely an issue of focus, but we contend that a theoretical model crafted to explain how one learns from stressful encounters would propose different constructs and relationships from a model developed to address the mitigation of strain.

Similarly, as noted above, the Transactional model and COR theory imply that an imbalance of greater environmental demands than resources produces strain (Hobfoll, 1989; Hobfoll & Shirom, 2000; Lazarus, 1966, 2001), and in the Effort-Reward model, imbalance occurs when one receives fewer rewards than is believed to be deserved (Siegrist, 1996). But, what about the situations where resources meet or exceed demands or where rewards are proportional to or greater than effort? Strain might not be the predominant outcome of such situations, yet the experience of stress is still a part of them. Simply because one is able to manage a stressful situation with the resources at one’s disposal does not mean that it is not stressful to utilize those resources in handling the stressor. Also, even if an individual appraises that rewards will exceed effort, effort must still be made, and with effort comes the stress experience. Stress occurs regardless of the outcome of the stressful encounter.

However, likely because of our understandable eagerness to assist employees with the management of workplace stress, our theories have assumed that stress happens only when strain, or another negative outcome, is the result. Thus, even a traditional definition of stress, as given above, suggests this is the case. Consequently, these balance theories neither fully explain
the processing of experiences that do not result in overwhelming strain nor do they elucidate their results. However, it is likely the case that individuals experience many such stressful situations throughout the typical workday. In order to better understand the experience of stress, research needs to include the entirety of stress, and, as noted above, scholars have begun to consider the “positives” of health and well-being.

In addition, these balance models specify neither the impact of previous encounters on a present stressful situation nor the duration of a stress experience. However, just as others have noted the importance of prior experiences on present encounters (e.g., Daniels, Harris, & Briner, 2004; Warr, 2006), we argue that past situations impact present ones in a variety of ways, such as through the accumulation of resources, the evaluation of stressors, or the changing of expected outcomes in the present situation based upon previous ones. Moreover, although scholars have begun to empirically analyze issues related to the duration of stress (i.e., stress recovery) (e.g., Sonnentag, Perrewé, & Ganster, 2009), balance theories are not entirely capable of accounting for these phenomena. Finally, although expectancy has played an important role in motivation research (Ambrose & Kulik, 1999), we believe that stress research has mostly neglected the vital role that future expectations play in present stress experiences.

In sum, although providing at least a partial explanation of the consequences of an inability to cope (i.e., strain), these models provide insufficient explanations for three very important aspects of stressful experiences: 1. Whether and how individuals adapt and learn from experienced stress, 2. The role of time and past experiences in the processing of stressful encounters, and 3. How the expected outcome(s) of a stressful situation influences response to stressors. As noted above and discussed below, empirical research already has begun to partially address these issues, and we believe that, in order to more completely understand the stress
Cognitive Activation Theory of Stress 12

experience, research would benefit from a conceptual foundation that provides the framing for such research. The following discussion examines the Cognitive Activation Theory of Stress (CATS), which is a theory of stress we believe has strong implications for occupational stress research. Further, we provide a general illustration of our interpretation and integration of the CATS framework in work stress research in Figure 1.

-----------------------------------------------------------------------------------------------------------------

Insert Figure 1 about here

-----------------------------------------------------------------------------------------------------------------

COGNITIVE ACTIVATION THEORY OF STRESS & PERSEVERATIVE COGNITION

Overview

Although the experience may produce discomfort for the individual, arousal and stress are vital to the operation of complex brains (Ursin, 2005), and the Cognitive Activation Theory of Stress (CATS) (Ursin & Eriksen, 2004) suggests that repeated experiences with a stimulus allows individuals to adapt and regulate themselves (Ursin & Eriksen, 2004). The purpose of arousal is to compel the individual to remove the source of the stress “alarm” and the alarm itself, similar to how it has been argued that the function of affect is to direct action (Frijda, 1986). Or, if not removed, the individual then is able to sustain the activation necessary to handle the stressor. Consequently, the stress experience is part of an adaptive and beneficial system that has survived the test of evolution.

CATS argues that because the stress alarm occurs when there is a discrepancy between what is desired and what is reality, individuals will associate a probability with the likelihood of abolishing the alarm and its source. This expectancy will have a strong influence on the level of arousal. At its simplest, if the person has control and expects a desired outcome, then the alarm
will not be activated (i.e., stressors will not be felt, psychologically or physiologically). However, if the future is unpredictable and/or an individual does not have the necessary resources to handle the demands, then the alarm is activated. Further, there are instances (e.g., avoidant coping, learned helplessness) when individuals do not possess the necessary resources to handle the situation and remove themselves from it, thus engaging a passive response that provokes a positive outcome expectation, reducing stress activation.

Much like previous research (e.g., Daniels, et al., 2004; Lazarus, 1999) has argued for the importance of appraisal and cognition to stress and coping, clearly, the cognitive appraisal of a stress experience is a critical element of CATS. In the field of cognition, much research also has examined the importance of appraisal. For instance, it has been argued that appraisals are based on mental models that are a simplified representation of the self and the environment, and that individuals make appraisals through either a controlled or an automatic mechanism of processing information (Power & Dalgleish, 1997). Also, Warr (2006) suggested that when individuals appraise their environment, they judge it, either intentionally or through routine habit. In a similar vein, CATS (Ursin & Eriksen, 2004) holds that appraisals involve the development of future expectations.

**Expectancies**

According to CATS (Ursin & Eriksen, 2004), appraisals made by individuals are determinations of expectancies, which can be divided into either stimulus or outcome expectancies. Stimulus expectancies concern the understanding that a particular stressor leads to a particular event, and it provides individuals with the ability to psychologically defend against or distort the stressor. Outcome expectancies connect a response to a stressful situation with an outcome from that response, and individuals develop outcome expectancies that represent
positive (i.e., coping), negative (i.e., hopeless), or no (i.e., helpless) expectancy; each of these are
detailed below.

Carver and Scheier (1990) argued that individuals self-regulate to minimize the
discrepancies between expectations and their present state. Further, they stated that expectancies
about one’s eventual outcome play an important role in whether a response to a challenge is to
exert effort to attain a goal or to disengage from such attempts. CATS can be thought of as an
extension of this theory, because it suggests that the expected favorability of an outcome is
critical to determining how a person responds to stressors (Ursin & Eriksen, 2004).

When a person anticipates that a chosen response to a stressor will lead to a positive
outcome, that individual is coping. Thus, coping involves beliefs both that actions taken in
response to a stressor can affect an outcome and that these actions will affect the outcome in a
positive (i.e., desirable) fashion. Although this conception of coping may seem to be a radical
departure from previous theory, it is related to the expectancy theory of motivation. In theories of
motivation, expectancy has been defined as the subjective belief that a given effort will lead to a
specific outcome on the job. Expectancies are judgments about the relationships between given
levels of effort and outcomes (Fudge & Schlacter, 1999; Vroom, 1964). Thus, it is the
expectation that effort will lead to a valued outcome that is the motivating force (House, Shapiro,
& Wahba, 1974; Wahba & House, 1974). Similarly, the expected outcome is the motivating
force for the behavioral response to stressors.

As noted by Ursin (1998), although the term *coping* has been used for the strategy
selected or actions taken when confronting a stressful situation (e.g., Folkman & Lazarus, 1985;
Lazarus & Folkman, 1984), it is only when it is used for the expected results from these
strategies that coping is predictive of health. For example, in a sample of parachutists, Ursin,
Baade, and Levine (1978) found that reported fear and endocrine responses were reduced after the first training session, prior to performance reaching an acceptable level. Thus, neither successful performance nor feedback from performance of parachuting reduced arousal; it was the expectation of being able to perform that decreased the stress response. Similarly, a recent study (i.e., Moreno-Jimenez, Rodriguez-Munoz, Pastor, Sanz-Vergel, & Garrosa, 2009) found that being psychologically detached from work resulted in lower psychological strain when facing workplace bullying than for those who were low in psychological detachment from work, suggesting the potentially adaptive nature (i.e., positive outcome expectancy) of avoidant coping. In both of these example studies, individuals were psychologically and/or physiologically coping with the stressful situation because they expected their actions to lead to a positive outcome, not because they engaged in particular actions that uniformly across situations would be considered coping behaviors. In other words, coping is neither a strategy nor a behavior, but, instead, it is the adoption of an expected and positive outcome, regardless of the actions (e.g., problem focused-actions, avoidant behavior) one has or has not taken or will take in response to a stressor.

Helplessness describes a situation where an individual perceives no relationship between his or her actions and the outcome from a stressful encounter; it is similar to stating that one feels no control or influence over the outcome. Although normally producing increased stress activation, in a prolonged state of helplessness individuals may experience reduced arousal, particularly if it leads to some form of subsequent gain or support from others. In such situations, helplessness would be similar to coping. However, hopelessness can be considered the opposite of coping, because it occurs when someone’s responses to stressors have results, but the effects
are perceived as entirely negative. An expectancy of failure also has been connected to hopelessness by motivation researchers (e.g., Weiner, 2010).

Further, the expectancies that individuals maintain can be quantified via three dimensions: strength, perceived probability, and affective value (Ursin & Eriksen, 2004). The strength of an expectation stems from the salience of the stressful event, the contiguity and number of the event’s occurrences, and the frequency with which they occur together. The perceived probability concerning stimulus expectancies can be thought of as predictability, whereas for outcome expectancies, it is similar to perceived control or understanding. Lastly, the affective value of an expectancy describes the hedonic value (i.e., positive, negative, neutral) of the expected outcome.

Variation in stimulus expectancies stems from psychological defense and distortion (Ursin & Eriksen, 2004). This psychological defense is a cognitive filter mechanism that denies or distorts the reality of the stressor based on the level of strength, probability, and value placed on it. As described above, outcome expectancies can be positive (i.e., coping), such as when the strength, probability, and value of the expectancy are high and positive (i.e., instrumental coping), or when the strength and probability are high and positive and the value is high and negative (i.e., avoidant coping). Thus, again, coping is not an action, but rather the establishment of positive response outcome expectancies.

These characterizations of expectancies also allow for formal differentiations, concerning their relationship to stress experiences, between the emotions of fear, safety, and anxiety, which are all related to future expectancies (Ursin & Eriksen, 2004). Fear is high arousal produced by a circumstance where the affective value of a stressor is highly negative, and the perceived probability of it happening is high. Although a highly probable event would usually lead to low
arousal, because of the highly unattractive nature of this situation, fear is felt. However, when the perceived probability of this undesirable event is low, arousal is low and feelings of safety arise. Finally, when there is uncertainty about the probability of an event (i.e., probability is roughly at chance level), anxiety is produced.

**The CATS Explanation of the Stress Process**

As discussed by Ursin and Eriksen (2004), CATS proposes four components to the stress process. The first part is the stress stimuli (i.e., stressors) or load. It is argued that it is not the physical characteristics of a stimulus that elicit the stress response (Levine & Ursin, 1991), but a person’s appraisal (i.e., the second stage in the process) based on (previous) experience and (future) expectations that translates a situation into a stressful experience. Certainly, some stressors would be regarded as negative across persons, time, and situation. However, individual and situational differences (e.g., prior learning, personality, contextual setting) are likely to influence evaluations of most stressors.

Second in the stress process is the stress experience (i.e., appraised and felt stress). The stressors most often reported in the literature are those that stem from the stress experience itself. These are the physical, physiological, psychological, and emotional loads or demands felt by the individual that are reported as stress to the extent that they are deemed a loss or a threat. It is this feeling of stress that some could argue is the most relevant to occupational stress and, as noted by Ursin and Eriksen (2004), it is what is reported on job stress questionnaires when individuals are asked whether something is a source of stress. The respondent is reporting the expectancies developed for this situation or source of stress. Similarly, Jex, Beehr, and Roberts (1992) suggested that survey measures using the word *stress* are likely to assess respondents’ post-appraisal evaluations of the stressor, not merely the presence of the stressor.
The third part is the individual’s general response (“alarm”) to the stress experience. Similarly, Selye (1955) argued that an alarm reaction occurs prior to adaptation. In this phase, as argued by Ursin and Eriksen (2004), the individual has an increase in arousal, and there is a specific response to handle the cause of the alarm. Like above, individual and situational differences play a role in the alarm reaction (e.g., strength and duration of alarm) elicited in the individual during this stage. Because arousal affects many physiological systems, this is the most reliable and consistent part of the process to analyze (Ursin & Eriksen, 2004).

As argued by Ursin and Eriksen (2004), examining stress alarm behaviors, such as coping behaviors, coping strategies, or “ways of coping” (Lazarus & Folkman, 1984), is problematic, because these behaviors can occur under different degrees of arousal and future expectancy. Also, it is too simplistic to argue that certain coping behaviors are necessarily always “adaptive” (e.g., problem-focused coping) or “maladaptive” (e.g., emotion-focused coping), because the response to the stressor is determined by expectations of whether coping (i.e., a positive outcome) will occur, not by the particular coping strategy taken (Eriksen, Murison, Pensgaard, & Ursin, 2005). Consequently, the internal state of the individual, which is predictive of health, is not connected to the coping strategy chosen.

The final component of the process is the person’s experience (“feedback”) of the stress response. After responding to a stressor, the individual receives feedback regarding the results of his or her response, and this feedback can influence the feeling of being stressed. Also, the individual can alter the perception of the stressor and/or the outcome expectancies regarding future experiences based upon this feedback. Ursin and Eriksen (2004) suggest that it is often attempted to evaluate feedback through questionnaires, such as those concerning health complaints. But, they contend that respondents would have difficulty distinguishing between the
Cognitive Activation Theory of Stress

stress experience (step 2 of the process) and the feedback response because of the feedback loop necessary to the evaluation of stress stimuli.

Similarly, Lazarus (1993) argued that four concepts must be elaborated when detailing the stress process, including: the stressor (or causal agent); the evaluation of the stressor, differentiating between the stressful and non-stressful components; the processes by which the person copes with these stressful demands; and, the effects or stress reactions of the individual (see Dewe, 2001). Although Lazarus (1993, p.4) argued that a clear distinction between physiological stress and psychological stress is “personal meaning,” these core components of the stress process appear to be recognized by psychological, organizational, and physiological scholars.

Perseverative Cognition

Stress theories have focused on the reactions of individuals during stressors, and, suggested that the more frequent and stronger responses to stressors are the primary pathogens in stress (Brosschot, Pieper, & Thayer, 2005). Consequently, these theories and the measures developed from them have failed to measure the duration of the stress response (i.e., stress responses before, during, and after the stressful experience), which is likely key in explaining the connection between stressors and outcomes (Brosschot & Thayer, 1998). Certainly, there are some researchers (e.g., Aspinwall & Taylor, 1997; Daniels, et al., 2004; Sonnentag & Fritz, 2007; Sonnentag, Kuttler, & Fritz, 2010) who have endeavored to examine stressful experiences beyond the short-term. However, the majority of empirical research has neglected what are likely the major factors in the stress response, namely, anticipatory (i.e., the prolonging of activation preceding a stressor), recovery (i.e., the prolonging of activation immediately following a stressor), and recurrent (i.e., the prolonging of activation after recovery through the stressor’s
mental re-creation by the individual) stress experiences (Brosschot, et al., 2005; Pieper & Brosschot, 2005). Further, Pieper and Brosschot (2005) suggested that these mental representations of stressors could be characterized as perseverative cognitive processes which act to prolong the experience of stress.

CATS argues that health is threatened only by sustained activation, not by short-term arousal. As discussed in greater detail below, this suggests that short-term (phasic) activation has training effects, whereas, sustained activation produces strain. However, not long after CATS was proposed, Brosschot, Pieper, and Thayer (2005) noted that stress theories have neglected to explain the cause of sustained physiological activation. For example, although CATS suggests that negative expectancy produces sustained activation, what causes negative expectancy to be prolonged? Eriksen and Ursin (2006) suggested that the protraction of negative expectancy is due in part to sensitization, “increased efficiency in a neural circuit” (p. 63), in response to stressors and to a cognitive mirror of sensitization. Brosschot and colleagues elaborated the argument concerning this cognitive counterpart by arguing that individuals only experience prolonged activation when they continue to lend support to their negative outcome expectancies (Brosschot, et al., 2005), and by focusing or ruminating on these stressors, individuals are prolonging their experience of stressful events.

Brosschot and colleagues (2005) offered a detailed description of the prolonging of stressful experiences, arguing that extended activation is the result of a cognitive representation of stressors they termed perseverative cognition. It is worth noting that Pieper and Brosschot (2005) suggest that at least part of the perseverating occurs when an individual is unconscious, such as during sleep. Thus, the concept of perseverative cognition provides a more thorough
explanation of the mechanism underlying the prolonging of stressors than that provided in CATS, and, consequently, it is a useful addition to this theory.

We suggest that, within our framework in Figure 1, perseverative cognition represents an individual characteristic or resource that clearly could have a detrimental influence on the experience of stress. Although generally prior stress research has conceptualized resources as only beneficial for the individual, we contend that researchers should recognize that resources can not only mitigate and but also exacerbate stressful experiences through their impact on expectancies of and responses to stressful encounters. We will provide a further discussion of resources in our directions for future research.

**Empirical Support of CATS and Perseverative Cognition**

Although little research has provided direct tests of the importance of anticipatory stress, in a study examining cortisol stress response (Gaab, Rohleder, Nater, & Ehlert, 2005), personality factors (i.e., competence and control orientation) were found to influence cortisol response through situation-specific appraisal (i.e., anticipatory stress). In addition, anticipatory cognitive appraisal demonstrated a stronger relationship with cortisol response than personality or retrospective cognitive appraisal. These results support arguments for the importance of anticipating stress on the biological stress response.

Cognitive perseveration is evidenced in the constructs of worry and rumination, which are thought to be related to the delayed disengagement from threatening information. Some research (i.e., Pieper, Brosschot, Van der Leeden, & Thayer, 2007) supports the belief that worry might have a stronger relationship with health than stressful events, because the experience of worry about a stressor generally is longer than that of the event itself. Pieper and colleagues (2007) found that worry episodes, particularly those concerning work episodes and future
stressors, and stressful events had similar and independent associations with elevated heart rate and decreased heart rate variability, even after adding biobehavioral constructs (i.e., gender, age, body mass, and negative health behaviors), trait factors (i.e., worry, depression, anxiety, and hostility), and job strain to their statistical model. Another study (i.e., Brosschot, van Dijk, & Thayer, 2007) found that worry demonstrated a greater impact on heart rate and heart rate variability than did the stressors (i.e., annoying or disturbing events).

Worry and rumination also have been linked either directly or indirectly to important health outcomes, such as sleep quality, increased cortisol, higher heart rate, and increased mortality (see Brosschot, Gerin, & Thayer, 2006; Brosschot & Thayer, 2004). Also, a study (i.e., Verkuil, Brosschot, Putman, & Thayer, 2009) provided support for the contention that pathological (anxious) worry is related to an inadequate ability to prevent or disengage from the processing of threatening information, and this deficit could be an indicator of perseverative cognition. It also has been shown that trait worry only accounts for a partial explanation of daily worry (Verkuil, Brosschot, & Thayer, 2007).

Further, in a study assessing heart rate response after negative and positive emotions, Brosschot and Thayer (2003) found that heart rate activity after a negative emotional experience was longer than heart rate activity after a positive episode, suggesting that a primary distinction between the effects of positive and negative emotional responses could be the ability of negative emotions to prolong the experience of the stressor. Also, studies have demonstrated the role of rumination in, for instance, experiences of anger (Ray, Wilhelm, & Gross, 2008), anxiety and depression symptoms (Nolen-Hoeksema, 2000), and major depression (Kuehner & Weber, 1999). The research findings concerning worry, negative emotions, and rumination suggest that regardless of whether a future, stressful event occurs, an inability to prevent the mind from
dwelling on this possibility is a strong predictor of negative health outcomes. Further, we would suggest that in an organizational setting, employees who engage in worry and rumination are more likely to interpret job stressors (e.g., deadlines, interpersonal conflict) with negative expectancies (i.e., hopelessness and helplessness) such that they believe either they will fail or that there is nothing they can do about the stressor.

Positive and negative outcome expectancies, as described by CATS, are similar to optimism and pessimism, respectively. Optimism and pessimism have been argued to be generalized outcome expectancies (O'Connor & Cassidy, 2007), describing whether an individual expects positive or negative experiences in the future (Carver & Scheier, 1998). Across two cross-sectional studies, it was demonstrated that positive expectations buffered the relationship between stress and hopelessness, such that those experiencing high perceived stress who reported greater positive future thoughts reported lower hopelessness than did those experiencing high stress and fewer positive thoughts (O'Connor, O'Connor, O'Connor, Smallwood, & Miles, 2004).

O’Connor and Cassidy (2007) found that these general expectancies can be moderated by specific outcome expectancies. One particularly interesting finding was that, for pessimists experiencing stress, high levels of positive future thinking about specific events was related to increased hopelessness. This might suggest that, when persons who tend to expect negative outcomes (e.g., pessimists) experience stress, they will interpret even positive future expectancies in a negative light. These findings shed light on the strength of generalized outcome expectancies (e.g., worry, rumination, anxiety, pessimism) when individuals face specific, stressful situations.
HOW CATS CAN INFORM OUR UNDERSTANDING OF OCCUPATIONAL STRESS

Arnetz (2005) used the CATS theoretical lens in an organizational setting, finding that the clarity of a department’s goals were associated with the stress level (i.e., mental energy and work-related exhaustion) of that department’s employees. However, the CATS perspective primarily has been of assistance to non-organizational phenomena, such as for Chronic Fatigue Syndrome (Wyller, Eriksen, & Malterud, 2009) and socio-economic status (SES) related differences in health. For example, within the context of CATS, it can be argued that the stress responses that function as mediators between SES and health are determined by the acquired expectancies (i.e., coping or inability to cope) of individuals (Kristenson, Eriksen, Sluiter, Starke, & Ursin, 2004). It could be that, concerning those lower in SES, generally, their response to stress is hampered by an increased difficulty with both recovering after stressors and responding to new ones.

In addition, we believe that CATS also can provide greater understanding of occupational stress-related phenomena, regarding areas that have received some research attention and those that research generally has neglected. We suggested that CATS offers a theoretical framework for speaking to three stress-related issues that other occupational stress theories have struggled to address, including, whether and how individuals learn from experiences of stress, the role of time in the stress experience, and how expectancies direct one’s response to stressors. Below we will explain how we believe CATS can assist organizational researchers in each of these areas, prior to concluding with a review of several potential avenues for future research.
Learning

As noted in a recent review of occupational health research (i.e., Macik-Frey, et al., 2007), positive health has not received substantial research attention, and the authors agreed with Wright and Cropanzano (2000) that researchers have instead taken a disease perspective on occupational health issues. The disease perspective has dominated stress research as well. The principle theories (e.g., Job Demands-Control Support, Appraisal, Conservation of Resources) provide substantially more insight into the detrimental effects of strain than into the adaptive aspects of the stress experience. Unlike the negative outcome of stressful encounters (i.e., strain), the occupational stress field does not have a singular concept to describe the potentially favorable aspects of stressful experiences.

A number of different variables could be offered as describing the beneficial effects of experienced stress, such as challenge (LePine, LePine, & Saul, 2007), hardiness, self-efficacy, job satisfaction, locus of control, or engagement (Schaufeli & Bakker, 2004). However, these concepts provide inadequate explanations for the upside of experienced stress. For instance, if engagement is necessarily a positive outcome, it would imply that disengagement or avoidant behaviors are maladaptive, which, as argued earlier, is not the case (Moreno-Jimenez, et al., 2009). Also, hardiness (Maddi, et al., 2006) and general self-efficacy (Eden & Kinnar, 1991; Eden & Zuk, 1995) have been conceptualized as be stable individual differences, and job satisfaction limits the positive outcomes of stress to the workplace. Even if one were to suggest that these approaches provide adequate explanations for the “positives” of stressful situations, it is unarguable that, as a whole, empirical organizational stress research has focused attention on the damage to the individual experiencing stress and our theories of stress have failed to provide
a singular concept, to mirror that of strain, that explains the adaptive nature of stressful encounters.

CATS provides an avenue for the investigation and explanation of these functional results from stress. Stress is not viewed as detrimental to the individual by default, with the negative effects only mitigated by introducing something positive (e.g., control, social support, resources). Instead, the experience of stress itself has both positive (i.e., training effects) and negative (i.e., straining effects) ramifications for the individual, as driven by expectancies. With that in mind, researchers can investigate how and which resources influence the stress experience, prolonging either negative or positive expectancies as well as behavioral responses.

Certainly, outcomes proximal to the stress experience (e.g., job tension, workplace engagement, work-family conflict) can be indicators of the (mal)adaptive properties of stress, but these represent only one category of variables that would be useful to organizational research. In addition, scholars need to consider the long-term consequences of stressful experiences, and many have investigated the detrimental impact of chronic strain through constructs such as burnout (Halbesleben, 2006). However, what are the long-term consequences of adaptation to stress? Aside from the active role in Karasek’s (1979) Job Demands-Control model, there has been relatively little theoretical consideration of the healthful aspects of stress by organizational researchers. In the context of CATS, it becomes clear that the positive (i.e., training) results of stress yield a singular, distal construct that provides the connection between stressful encounters and long-term adaptation—learning.

Ursin (1998) argued that the most important reason for a decrease in the stress response is that the individual has learned something about the situation, because acquiring expectancies necessitates learning (Ursin & Eriksen, 2010). In other words, individual differences in outcome
expectancies are conceptualized as primarily stemming from differences in learning experiences (Ursin & Eriksen, 2004). Learning provides a reduction in uncertainty and expectations for future outcomes of stressful encounters, whether they are positive expectancies of coping or negative expectancies (e.g., psychological defense, learned helplessness). Further, the findings from a cross-sectional study of employees at an organization facing downsizing suggest that the survivors of previous organizational changes, which included many of the employees, developed positive outcome expectancies based on their past experiences (Svensen, Neset, & Eriksen, 2007).

Outside of the CATS literature, occupational research has begun to consider the construct of learning as an important outcome of stressful experiences. For instance, some have considered perceived mastery and self-efficacy (e.g., Parker & Sprigg, 1999) or learning computer software (i.e., Bond & Flaxman, 2006) as learning-related outcomes of stress. Taris and Feij (2004) found that high levels of strain had a negative impact on skill enlargement and skill acquisition, and another study (i.e., Daniels, Boocock, Glover, Hartley, & Holland, 2009) demonstrated that work-related learning mediated the relationship between responses to work demands (e.g., changing aspects of work activities) and pleasant affect. We believe that these results suggest that, for example, if employees are allowed to make mistakes without being subjected to punishment or abuse and they are encouraged to learn from their mistakes, they will be more likely to anticipate positive outcomes and interpret their environment as challenging as opposed to threatening.

Also, using both structural equation modeling and longitudinal hierarchical regression analyses across 3 samples, Holman and Wall (2002) tested direct, mediated, and moderated models of the relationships between work characteristics, learning-related outcomes (i.e., skill
utilization and self-efficacy), and strain. Their results demonstrated that mediated models best fit the data and supported the argument that learning and strain have reciprocal relationships, such that learning reduces strain and strain impedes learning. Further, as noted by Roberts (2006), the findings across a range of studies suggest that hardship can lead to improved outcomes for individuals, because individuals are able to learn from their experiences.

In sum, the likely path through which the stress experience affects subsequent behavior is individual learning. When appraising a situation, the individual’s stated or unstated desired outcome is to learn from this experience, and this is particularly the case when it is believed that the circumstance will recur in the future, as many stressful workplace situations actually do. Thus far, research in this emerging area has mostly examined perceived job-related learning and self-efficacy as learning-related outcomes of experienced stress. However, research also could examine other types of learning, such as learning related to the stress experience itself (i.e., stressors, expectancies of outcomes, responses to stressors, effectiveness of responses). For example, scholars could consider what changes the relationship between expectancies and an individual’s short- and long-term arousal level. In other words, when an employee expects a negative (or chance) outcome from a particular circumstance, but experiences and recognizes positive results from the stressful encounter, would not that be potentially the situation (and its converse) that is most likely to characterize learning related to stressful experiences? Thus, CATS allows researchers to theoretically frame and empirically test how negative appraisals can become “positive” experiences for employees, and how learning influences long-term stress activation and future appraisals of stressors.
Time & the Prolonging of the Stress Experience

Related to learning, the stress response develops over time (Eriksen, Olff, Murison, & Ursin, 1999). As shown by CATS, when individuals develop an efficient way of coping with stress, their psychological and physiological reactions tend to involve only brief arousal. Whereas, when persons engage in psychological defense (i.e., denial or distortion of the stressor), or have an inability to cope with stressors, their activation levels are prolonged, and the influence of the stressful situation is lengthened. Thus, it could be said that the effect of stress on the individual is more due to the inability to recover from work than to what happens during the workday (Ursin, 2000).

Further, research on stress recovery has demonstrated that some individuals have greater difficulties than others in recouping following a stressful situation. Geurts and Sonnentag (2006, p.483) argued that the essence of recovery is “… the psychophysiological systems that were activated during work will return to and stabilize at a baseline level, that is, a level that appears in a situation in which no special demands are made on the individual.” Successful recovery, however, differs across individuals (Rook & Zijlstra, 2006). For example, some persons may be able to recover by simply taking regular short breaks or vacations (Cartwright & Cooper, 1997), while others may need physical activity on a daily basis to be able to recover well (Rook & Zijlstra, 2006).

Scholars also recently have highlighted the importance of recovery in the stress process (see Sonnentag, et al., 2009) and that rumination prolongs physiological activation, hindering the recovery process (McCullough, Orsulak, Brandon, & Akers, 2007). Recovery could be considered a form of prolonged activation (Brosschot, et al., 2005; Kristenson, et al., 2004), and some evidence suggests that a poor ability to recover from stressors might be an important factor
linking sustained activation to ill health (Harris, Ursin, Murison, & Eriksen, 2007). These findings highlight the importance of recovery from stress, and lend support to the foundational arguments of CATS and perseverative cognition, namely, that, typically, it is less that the stressful event itself has ill health effects, and more that an individual’s \textit{response} to the stressor (e.g., anticipatory stress, worry, rumination, anxiety, recovery) has profound effects on health and well-being.

In addition, the harboring of negative or uncertain outcome expectations also promotes the extension of arousal by preventing the disengagement from previous, threatening or stressful situations (Verkuil, et al., 2009), encouraging recurrence of the stressor through its mental recreation (Pieper, et al., 2007). Moreover, before establishing the outcome expectancy in a particular situation, individuals often spend time vacillating from considering one coping strategy to contemplating another, as they ponder which one is likely to lead to a positive outcome. Consequently, even outside of what is typically measured as “the stress experience,” strain can be prolonged through an inability to recover, it may reoccur through mental representations of the stressor, and it may be maintained or increased during a stressful episode when individuals vacillate between different strategies for handling the stressor.

Thus, it can be seen that anticipatory stress, which has received little research attention, becomes an important variable in the \textit{true} experience of stress. For instance, one group of researchers (i.e., Waugh, Panage, Mendes, & Gotlib, 2010) found that anticipating a speech and giving a speech, although they had different underlying affective mechanisms, yielded similar cardiovascular recovery, suggesting that recovering from an anticipated stressor and recovering from the stressful event involve a similar cardiovascular profile. Also, an experimental study demonstrated that those participants in a gambling task who were placed in an anticipatory stress
condition took longer to make advantageous decisions in the task (i.e., Preston, Buchanan, Stansfield, & Bechara, 2007). This finding could suggest that the addition of anticipatory stress (e.g., worry) to the stressful brooding and vacillating over coping strategies that individuals naturally do in stressful situations intensifies and elongates the experience of stress. Clearly, there is a substantial amount of time in the experience of stress, and in the transfer of learning from one stressful experience to another that has yet to be fully examined by research.

However, if effective, such studies would improve our knowledge of the link between short-term stressors that are internally prolonged by the individual, and the long-term consequences of stress, such as cardiovascular disease. This particularly would be the case for research that tracks an individual moving through multiple, potentially stressful encounters. However, there are many other potential issues for researchers to consider as they relate to time. For example, does the expected duration of a stressor influence one’s response to a stressful situation? It seems likely that a subordinate would have a greater ability to cope with a demanding supervisor who needs to be satisfied for only one day than one that needs to be contented for several months. Even if the employee expects a positive, eventual outcome, a greater duration of the stressor leading up to that outcome would likely take an increased toll on the individual. In a similar fashion, the length of time a resource is available would seem to have an influence on a person’s appraisal of a stressful situation. There are many other such potential research questions where considerations of time add another layer to our understanding of the experience of stress. Such studies would provide organizational scholars with crucial insight into the development of the stress response over time, and CATS, when combined with a more elaborate explanation of the prolonged cognitive representation of stressors, as is provided by the
perseverative cognition hypothesis, can serve as a theoretical guide for researchers conducting this type of research.

**Expectancies Guide Response to Stressors**

For many years, appraisal has been an important component of stress theory. As discussed earlier, Lazarus’ Appraisal Model (1966; Lazarus & Folkman, 1984) has shaped the approach of many stress researchers, and numerous studies could be cited that framed research within the context of this model. However, some have continued to emphasize a desire for a greater consideration of appraisal when analyzing stress arousal and response (i.e., Day & Walker, 2007).

Appraisal is an important component of CATS, because it is through appraisal that a person develops expectations, and expectations determine whether a stimulus becomes a stressor and whether an individual believes that coping can be accomplished. These subjective and personally-constructed expectations (i.e., related to the response and to the outcome) are the crucial links between potential stressors and the stress experience. Without the conceptualization of appraisals or expectations, stress theories are under appreciating what might be the most fundamental aspect of the typical stress experience—individual interpretation of stimuli. Further, the adoption of expectancies is the result of learning (Ursin & Eriksen, 2010).

Related to expectancies, it appears that some confusion exists in the research community concerning the place of hopelessness and helplessness in the stress experience. For instance, a well-researched hopelessness scale (i.e., Beck, Weissman, Lester, & Trexler, 1974) operationalizes the construct in line with the CATS definition of it (i.e., negative outcome expectancy). In addition, the concepts of learned helplessness (Peterson, Maier, & Seligman, 1993) and hopelessness depression (Abramson, Alloy, & Metalsky, 1995) are in line with the
CATS explanations of helplessness and hopelessness. However, Luthans and Youssef (2007, p.332) noted that helplessness is the “conceptual opposite of an optimistic explanatory style.”

Using the CATS formulations, hopelessness (i.e., negative outcome expectancy regardless of coping response) could be considered conceptually opposite of optimism, but helplessness (i.e., no relation between coping response and expected outcome) could not be. O’Connor and Cassidy (2007, p.598) also suggested that individuals experience hopelessness when “there is no relationship between their behaviour and subsequent outcomes,” but that, instead, should be considered a description of helplessness. We believe that by having more distinct definitions of hopelessness and helplessness, as described by Ursin and Eriksen (2004), researchers will be better able to juxtapose these concepts against others and develop clearer explanations of how each of these fit within the stress experience.

DIRECTIONS FOR FUTURE RESEARCH

As Whetten, Felin, and King (2009) argued, organizational research frequently borrows theories and concepts from other disciplines without modifying them, where needed, to fit the organizational context. Thus, our primary suggestions for future occupational stress research are not only to empirically test relationships in the CATS model, as discussed in various directions given below, but also to consider the organizational context as an important aspect of how CATS is adapted to occupational stress research. Due to the recent development of CATS, and because research using CATS has occurred almost exclusively outside of the organizational sciences, we do not believe we are yet able to construct a complete occupational CATS model. Instead, occupational stress researchers need to consider the occupational or organizational features that would assist in adjusting the CATS model to the workplace environment. Below, we detail several potential avenues for future research based on the CATS model where scholars could
work to expand our knowledge of stressful experiences in ways that would elaborate and/or expand the model we have presented.

Resources

Karasek’s (1979) model suggests that job control is the most salient on-the-job resource, and Hobfol’s (1989) COR theory argued that a number of resource categories (i.e., conditions, objects, personal characteristics, energies) are of use to individuals facing stressors. However, occupational stress researchers have only characterized resources as being of benefit to the individual in a stressful situation. But, as noted earlier regarding perseverative cognition, resources can be helpful or detrimental to individuals coping with stressors. In addition, the (un)helpfulness of a particular resource often would be dependent on the particular situation and the outcome assessed. For instance, those high on neuroticism, typically considered a disadvantageous personality trait, have been found to obtain higher performance ratings when in a busy work environment (Smillie, Yeo, Furnham, & Jackson, 2006). Thus, when considering both the training and straining effects of stressful experiences, it could be argued that a particular resource is not necessarily always and entirely beneficial or harmful to the individual across a range of situations and outcomes, but more likely that it has both adaptive and maladaptive features depending on a variety of factors.

Also, researchers could examine the influence of prior learning from stressful encounters on resource accumulation. Further, can stressors become so demanding that resources are irrelevant to the individuals? At what level and type of stressors do particular resources become unimportant? Similarly, stressors and resources likely differ in their stability and/or availability to the individual. In sum, research could vary the transience, quality, and quantity of appraised stressors and resources to more accurately explain resource value.
Cognitive Defense

CATS argues that defending against or distorting stressors is the method for consciously altering one’s stimulus expectancies, the predictability that a stressor will be followed by a particular event, and that the stimulus expectancy is learned from previous stressful encounters (Ursin & Eriksen, 2004). However, psychological defense mechanisms have received relatively little attention in occupational stress research when compared to coping mechanisms. Although psychological defense has been found to be related to lower psychological well-being (Kernis, Lakey, & Heppner, 2008), other findings might suggest inconsistent relationships between defense and physiological reactivity to stress (Cramer, 2003).

However, the apparent inconsistency could be explained by the possibility that individuals differentially adopt various defense strategies. Future research could investigate whether defense strategy “preference” has an influence on physiological and psychological response to stressors. Potentially even more valuable to organizational stress research is the possibility that psychological defense mechanisms could partially explain the discrepancies between self- and physiological-report of strain, as suggested by other scholars (e.g., Cramer, 2003; Shedler, Mayman, & Manis, 1993).

Coping Generalization

Ursin and Eriksen (2004) suggest that coping generalizes across situations, leading to future expectations of success and failure in a range of situations. However, how and to what extent does one’s learning from previous stressful encounters generalize to the approach taken to other, future stressors? In a study reporting that specific future expectancies moderated the relationship between general expectancies (i.e., optimism and pessimism) and hopelessness, O’Connor and Cassidy (2007) suggested that the relationship between generalized and specific
expectancies lacks clarity, implying that future research should address this matter. Also, when
and how does perceived learning develop into unrealistic expectations or narcissistic beliefs
about one’s capabilities? This substantial number of unknown relationships concerning the
generalization of coping provides scholars many avenues of research.

The Beginning and the Ending

Pieper and Brosschot (2005) argued that future research should clearly establish the onset
and offset of stressful events. Research on stress recovery suggests that the effects of a stressor
extend beyond any objective presence it may have. In addition, the ability of resources to
prolong stressful activation supports the same notion. Consequently, without an empirically-
based understanding, the beginning and ending of strain (and learning) become indistinct. As
highlighted above, research already has begun to address the recovery needs of individuals
facing stressors, and future research along these lines should continue and also consider how
individual differences (e.g., perseverative cognition) might change these relationships. However,
much less attention has been directed to anticipatory stress, and a fruitful avenue of research
would be to consider when anticipatory (psychological or physiological) stress begins, what
moderates when it begins, and what its trajectory is to a stressful event.

In addition, scholars could research how long-term individual learning relates to the onset
and offset of workplace stress. The role of emotions in the production of health and resiliency
over time has begun to draw greater research attention, such as through the Broaden-and-Build
theory of positive emotions (Fredrickson, 1998, 2001). Positive emotions could emerge as the
result of learning from stressful experiences, and this growing body of research seems to suggest
that positive emotions, as examples, build psychological resources (Fredrickson, Tugade,
Waugh, & Larkin, 2003), produce a wide range of personal resources that lead to greater life
satisfaction (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008), and promote a broadened
cognitive state (i.e., holistic processing and attention flexibility; Johnson, Waugh, & Fredrickson,
2010). Consequently, stress researchers could further our understanding of learning by
examining how stressful experiences relate to positive emotions, cognitive states and stress-
related learning over time.

The Importance of Interdisciplinary Research

Recently, Heaphy and Dutton (2008) encouraged the integration of physiological data
into organizational research, urging researchers to pursue interdisciplinary research. Certainly,
we join with Heaphy and Dutton’s (2008) encouragement, and this paper could be viewed as an
attempt to integrate an “outside” theory into occupational stress research. However, although we
believe that the CATS model of stress can be of great assistance to occupational stress
researchers, research has yet to elucidate many of the complex relationships between physiology,
psychology, and stress.

For example, one study (i.e., Wirtz, et al., 2006), utilizing an Appraisal perspective
(Lazarus & Folkman, 1984) on stress, found that a greater fibrin stress response was produced
when individuals evaluated a stressor as more challenging or threatening (i.e., primary
appraisals). But, there was no significant relationship with fibrin stress response for perceived
control or beliefs about one’s abilities to cope (i.e., secondary appraisals), and this finding would
appear to run contrary to much of the occupational stress literature, which suggests that beliefs
about control and self-efficacy are important to the individual’s psychological responses to
stressors.

However, as noted by Day and Walker (2007), there are multiple components to an
individual’s physiological response to stress. Also, in a review of ambulatory assessment in
industrial and organizational psychology, Klumb, Elfering, and Herre (2009) suggested that the
determination of the best indicator(s) (e.g., heart rate, blood pressure, EEG) of the relationship
between stressors and strains depends on the type of strain under investigation (e.g., physical,
musculoskeletal, mental). In order for occupational stress researchers to benefit from the
integration of physiological data, it is important that we not only seek such data but that we
carefully consider what it measures and how we will be able to integrate it into our present
knowledge.

Conclusion

Macik-Frey, Quick, and Nelson (2007) presented findings suggesting that despite the fact
that the field of occupational health is broader than the theme of stress, stress remains a dominant
issue in the field of workplace well-being. We believe that CATS can provide stress researchers
with the perspective necessary in order to better integrate our future studies with the new
directions of occupational health research (e.g., positive health). Consequently, although
occupational stress might continue to be a widely investigated topic within the broader area of
occupational health and well-being, it also can be of better service to the occupational health
field as a whole.
REFERENCES


FIGURE 1

An Integrative Theoretical Approach to Work Stress