An Integrated Control Theory Model of Work Motivation

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A model that integrates several different motivational theories and previous control theory models is presented as a possible metatheory to focus future theoretical and empirical efforts. The proposed model is dynamic, parsimonious, and focuses on self-regulation and the underlying cognitive mechanisms of motivation. In explicating this model, numerous hypotheses are derived regarding (a) the nature of goals and feedback; (b) cognitive, behavioral, and affective reactions to goals and feedback; and (c) the role of attributions, expectancies, and goal hierarchies in determining those reactions.

Work motivation typically has been described within the organizational behavior literature as the set of psychological processes that cause the initiation, direction, intensity, and persistence of behavior (Campbell & Pritchard, 1976; Pinder, 1984). Despite some definitional agreement, current approaches to motivation appear as a splintered and perplexing array of theories, few with overwhelming empirical support and most with unresolved theoretical ambiguities or inadequacies. This situation is both undesirable and unnecessary. It is undesirable because of the confusion created, the absence of intelligible guidelines for application, and clear transgression of the principle of scientific parsimony (Hollenbeck, in press). It is unnecessary because the constructs overlap considerably and because the different perspectives rarely contradict and often augment each other (Campbell & Pritchard, 1976; Landy & Becker, 1987).

One form of synthesis is the development of a metatheory, a framework that reasonably links existing theories (Landy & Becker, 1987). In a metatheory, the current component theories would be consigned to the role of middle range theories (Pinder, 1984) and would remain useful for application to specific motivational problems, whereas the integrated metatheory would provide a more general framework for understanding work motivation and would guide the refinement of the component theories. The purpose of this paper is to propose one possible metatheory, using control theory as the integrating framework. To achieve this goal, the basic elements of control theory are briefly reviewed, an integrated control theory model of work motivation is presented, and this model is contrasted with existing ones.

Using control theory as the integrating framework is advantageous for several reasons. First, as noted by Lord and Hanges (1987), although control theory is not a fully developed theory of motivation, its dynamic structure easily allows the integration of other theories. In this paper, it will be shown that a control theory model of motivation explicitly incorporates feedback, goal-setting, expectancy, and attribution theories, and it can be extended to include several other theories (e.g., social learning theory). In addition to providing the impetus for integration, control theory is parsimonious because even as the others are incorporated, it can remain a sim-
ple heuristic. Another benefit is that focus is directed to the cognitive processes underlying motivation, the absence of which has been a criticism of current approaches (Igen & Klein, in press; Landy & Becker, 1987).

**Control Theory**

Control theory, present for some time (e.g., Wiener, 1948), has been a useful framework for theoretical development in many fields (Carver & Scheier, 1981). According to the cybernetic hypothesis (Wiener, 1948), the feedback loop is the fundamental building block of action. In its simplest form, the feedback loop consists of four elements: a referent standard or goal, a sensor or input function, a comparator, and an effector or output function. In the often-used example of a thermostat controlling the temperature of a room, the referent standard is the temperature the thermostat is set at, the sensor is the element monitoring the current room temperature, the comparator is the mechanism that compares the current and desired temperatures, and the effector is the furnace or air conditioner. In this simple feedback sequence, illustrated in Figure 1, an input is perceived by the sensor, which sends a signal to the comparator, where it is tested against the standard (Powers, 1973). If this comparison reveals a discrepancy, an error signal is generated, and the system takes some action via the effector to reduce the discrepancy. This process of sensing, comparing, and effecting is repeated until the discrepancy subsides.

In human control systems, feedback involves much more than the mechanical sensing of the environment, goals are not predetermined inflexible standards, and there are several alternatives for reducing discrepancies (Lord & Hanges, 1987). As a result, control theory can represent a very flexible, nonmechanical view of behavior (Lord & Hanges, 1987). Although human control systems are more complex, they do operate in the same basic way—utilizing feedback to ensure the attainment of goals. Consider, for example, a salesperson who has accepted a quarterly sales quota as a personal goal (the standard). The input function would be information the salesperson perceives about his or her current sales performance. When this information is compared to the standard, the salesperson forms a perception of how well he or she is meeting thequota. If this comparison reveals a discrepancy, the salesperson will take some corrective action, possibly increasing the number of new contacts.

When framed as a theory of behavior, control theory has two primary elements: one cognitive, the other affective (Carver & Scheier, 1981). The cognitive component consists of internal goals, the processing of information about one's current state, and the comparison of that state with those goals. The affective component arises from perceived discrepancies between one's desired and current states, and behavior is initiated from one's desire to resolve those discrepancies (Carver & Scheier, 1981). Complex behaviors can be explained by hierarchies of
feedback loops. In such hierarchies, the means to reduce discrepancies in higher order feedback loops become the standards of lower order loops (Lichtenstein & Brewer, 1980; Powers, 1973). That is, the output function of one feedback loop might consist of a string of other loops, and each of those, in turn, might contain other strings of loops, and so on (Miller, Galanter, & Pribram, 1960).

For example, the output function in the previous example—increasing new contacts—is made up of several actions, including finding potential customers and making the initial contact. Thus, on closer inspection, this output consists of at least two feedback loops—finding and contacting. Each of these could, in turn, be broken down further with the hierarchy extended down to a loop involving neural signals and changes in muscle tension associated with turning the pages in a phone book. The result is a hierarchical plan for increasing sales through increasing new contacts. Powers (1973) proposed that the human nervous system embodies a detailed hierarchy of such feedback loops.

This hierarchy of control also could be extended upward. That is, the action of meeting the sales quota could be part of the output function of a higher order standard, perhaps getting a monetary bonus. Getting that bonus may, in itself, be part of the effector of yet a higher standard (e.g., buying a new house). Therefore, in order to achieve any given standard, chains of subgoals, necessary partial accomplishments, may need to be established, with each subgoal being pursued sequentially as attention shifts from one control loop to another (Lord & Hanges, 1987; Powers, 1973; Shank & Abelson, 1977). This shifting of attention within goal hierarchies is an important component of control theory, given the limited human capacity for conscious processing.

The feedback loops discussed above are referred to in cybernetics as negative feedback loops because the response to an error is the reduction of that error (Powers, 1973). In cybernetics, positive feedback results in an enlargement of the discrepancy, and a positive feedback loop is a system that tries to maximize distance from, rather than match, a standard. The assumption underlying these definitions is that discrepancies in either direction are equally undesirable. Although this is true for many mechanical systems, it usually is not the case with human systems. To avoid confusion, the more common organizational behavior usage of the terms positive and negative will be employed rather than the cybernetic definitions. That is, positive feedback will refer to information denoting one has exceeded a goal, negative feedback to information indicating the standard was not attained.

Several authors have recognized the potential explanatory power of control theory and have used it to examine behavior in organizations (e.g., Campion & Lord, 1982; Hollenbeck & Brief, 1988; Taylor, Fisher, & Ilgen, 1984). Even though these authors have laid the groundwork for a control theory model of work motivation, an examination of these models reveals some inconsistencies. The problem is not that these models are incongruent with the tenets of control theory or with empirical findings. Rather, the problem is that their different perspectives prohibit any one of them from providing a comprehensive model. In addition, inconsistencies in their assumptions and treatments do not allow a coherent model to be arrived at through a simple aggregation of the available literature. Given that these perspectives can be integrated, doing so should aid future research and conceptual development by focusing efforts and preventing further divergence. Thus, this paper not only integrates several motivational perspectives into a control theory model, but it also unifies the different existing control theory models.

**An Integrated Control Theory Model**

The model presented in Figure 2 is a control theory model of work motivation that integrates the works of Carver and Scheier, Lord, Taylor, Hollenbeck, and their colleagues (Campion &
Lord, 1982; Carver, 1979; Carver, Blaney, & Scheter, 1979; Carver & Scheter, 1981, 1982; Hollenbeck, in press; Hollenbeck & Brief, 1988; Hollenbeck & Williams, 1987; Lord & Hanges, 1987; Taylor et al., 1984). In comparing this model to Figure 1, goals are equivalent to the referent standard, the comparator remains the same, behavior represents the effector, and feedback represents the sensor. The primary difference is the inclusion of several cognitive processes between the comparator and the effector. These additional processes reflect that in human systems neither the sensor, standards, nor effector are necessarily fixed quantities. The nature and function of the elements in this integrated model are delineated below. The specific hypotheses generated in explicating the model are summarized in tabular form at the end of the section.

**Goals**

In line with the extensive goal-setting literature, an individual’s personal goals (Box 1) are the immediate precursors of behavior (Box 2) (Locke, Shaw, Saari, & Latham, 1981; Mento, Steel, & Karren, 1987). Given a control theory framework, however, action actually initiates from perceived discrepancies (Miller et al., 1960). In addition, it is acknowledged that intentions do not always get translated into behaviors (Ajzen & Fishbein, 1977) and that behaviors, reflecting the magnitude and direction of effort,

![Figure 2. An integrated control theory model of work motivation.](image-url)
are but partial determinants of performance (Box 3). Goals may differ on several dimensions, including difficulty and specificity (Locke et al., 1981). In control theory, the goal difficulty-performance relationship is explained by noting that difficult goals require greater efforts to avoid discrepancies (Campion & Lord, 1982; Lord & Hanges, 1987). Returning to the example used earlier, assume a salesperson achieves $20,000 in sales during the first month of a quarter. If that salesperson’s quarterly quota is $100,000, he or she is much more likely to perceive a discrepancy and the need to take corrective action than if that quota was an easier goal of $70,000.

The goal specificity—performance relationship also can be explained by control theory. Vague goals make poor referent standards because there are many situations in which no discrepancy would be indicated and, therefore, there would be no need for corrective action (Campion & Lord, 1982). A first-month performance level of $20,000 is likely to be perceived as inadequate with a specific quarterly goal of $100,000. This same initial performance level is less likely to be perceived as a problem with a more general goal of between $75,000 and $125,000 or a vague nonquantitative goal such as do your best. Klein, Whitener, and Ilgen (1988) provided support for this position when they found that specific goals were found associated with smaller goal-performance discrepancies. Because vague goals allow more levels of performance to be considered goal attainment, specificity also would affect the variability of performance across individuals, with specific goals resulting in less variability in performance (Klein et al., 1988; Locke, Chah, Harrison, & Lustgarten, in press).

Feedback

At some point during or after task performance, feedback (Box 4) is provided or sought out by the individual. Task feedback, as defined by Ilgen, Fisher, and Taylor (1979), is a message an individual receives from a source that contains information about the individual’s task performance. Feedback may be available continuously, intermittently, or only after task completion, depending on its source. Feedback may originate from others who are in a position to evaluate the individual’s behavior, from the task environment, or from within the individual (Greller & Herold, 1975; Ilgen et al., 1979). Additional feedback can be actively sought out through inquiry or monitoring to supplement the feedback that is provided (Ashford, 1986; Ashford & Cummings, 1983). Therefore, for almost all tasks, some knowledge of performance is available (Ammons, 1956).

The way that feedback is acquired and processed varies, however, according to the person’s awareness (Taylor et al., 1984). Conscious processing of feedback is most likely to occur (a) when an individual is unfamiliar with a situation, (b) when the feedback obtained is dramatically incongruent with expectations, and (c) when others cue the individual to attend to feedback (Taylor et al., 1984). All of these factors would serve to increase the salience of the feedback. How feedback is processed is important because it influences the nature of subsequent information processing and because unconsciously processed feedback may be biased towards the recipient’s expectations (Taylor et al., 1984).

In addition, feedback may be ignored, intentionally or unintentionally, for a multitude of reasons, including the perceived inaccuracy, irrelevance, or triviality of the information (Ilgen et al., 1979). Two conditions thought to decrease the likelihood that feedback will be ignored are valued goals (Power’s, 1973, concept of controlled quantity) and self-focus or self-attention. Individuals high in self-focus are more aware of inconsistencies between their ideal and actual selves (Wicklund, 1975), and this awareness increases the desire for consistency (Taylor & Fiske, 1978).

From a control theory perspective, self-attention and salient standards increase both the probability that a discrepancy will be discerned and the desire to reduce that discrep-
ancy. There is considerable evidence that the relationship between goal difficulty and performance is enhanced when goals are important and when subjects are high in self-focus (e.g., Hollenbeck & Williams, 1987). Finally, the feedback individuals compare to their goals at any given time will likely be a composite of information selectively obtained from a variety of sources and weighted by their evaluation of its value (Taylor et al., 1984). Therefore, it is the perceived situation, not the objective environment, that enters the comparator (Powers, 1973).

Goals and Feedback as Dual Elements. Results from studies in which goals and feedback were systematically varied (e.g., Bandura & Cervone, 1983; Becker, 1978) suggest that both are necessary to improve performance. Control theory provides an elegant explanation for this interaction (Taylor, 1983): It is knowledge of one’s previous performance relative to some goal that influences the amount of effort subsequently exerted (Becker, 1978). In addition to goals and feedback being of little value alone, it appears that when only one exists, individuals often will try to provide the other. When feedback is received in the absence of a goal, it often will be perceived as meaningless and will be ignored (Ashford, 1986; Taylor et al., 1984). Such feedback may, however, cue the individual to spontaneously set a goal (Ammons, 1956; Taylor et al., 1984). Likewise, in the absence of externally provided feedback, it is likely that individuals with goals will engage in feedback-seeking behavior in order to monitor the progress of goals (Ammons, 1956; Ashford & Cummings, 1983; Lord & Hanges, 1987). Control theory also emphasizes the need for congruence between goals and feedback in order for the system to operate effectively (Taylor et al., 1984).

Previous authors have pointed to the goal-feedback interaction and called for the integration of the two literatures (e.g., Taylor, 1983). Control theory suggests not only that goals and feedback can and should be integrated, but that they are inseparable—dual elements of a single motivational process. Similarities in the definition and function of goals and feedback support this position. Regarding definition, one is rarely described without mention of the other. For example, Ashford and Cummings (1983) define feedback as “information that denotes how well individuals are meeting various goals” (p. 372). In addition, feedback may be evaluative, referring to performance level, or descriptive, referencing actions or behaviors (Herold & Greller, 1977). Similarly, goals can be set for either the desired outcomes or the required behaviors. Concerning the functions of these constructs, both goals and feedback have been discussed as directing attention and action (Ashford & Cummings, 1983; Ilgen et al., 1979; Locke et al., 1981). Goals and feedback also both serve to clarify role expectations and, as such, are both often cited as useful for the reduction of role ambiguity (e.g., Naylor, Pritchard, & Ilgen, 1980). Finally, research in both literatures supports the notion that both factors serve to increase task interest and persistence (Elwell & Grindley, 1938; Locke & Bryan, 1967).

If goals and feedback are viewed as dual elements, as control theory suggests, the similarities between them lead to a number of hypotheses regarding the nature of these constructs and their relationship with performance. In general, the specificity of both feedback and goals has been related to performance (Ammons, 1956; Ilgen et al., 1979; Locke et al., 1981; Mento et al., 1987), although specificity often has been confounded with difficulty in the goal-setting literature. The evidence that goal specificity affects the variability of performance across individuals (Locke et al., in press) suggests that feedback specificity, similarly, may relate to performance variance. Likewise, the evidence that overly specific feedback early in the learning process may be dysfunctional (Ammons, 1956) suggests that in such contexts, overly specific goals may be similarly unproductive.

The feedback literature also asserts that, in general, the more frequent and immediate the feedback, the greater its impact (Ammons, 1956; Ilgen et al., 1979). Additionally, goals contain a
time dimension, and the feedback findings suggest that goals with a shorter time frame may be more effective, a position supported by Bandura and Schunk (1981). Given, however, that excessively frequent feedback can be detrimental (Ilgen et al., 1979), goals with too short a time frame may be dysfunctional. Another important dimension of feedback is its sign. Although the sign of a goal (i.e., to increase versus decrease something) is distinct from the sign of feedback, goal difficulty is clearly related to sign of feedback. The more difficult the goal, the greater the possibility that feedback regarding goal progress or attainment will be negative, and negative feedback is less likely to be accepted than is positive feedback (Ilgen et al., 1979). Similarly, the more difficult the goal, the less likely it is to be accepted (Matsui, Okada, & Mizuguchi, 1981).

A final similarity is the parallel between feedback receipt versus feedback seeking and individual goal setting versus the receipt of external goals. Ashford and Cummings (1983) suggested several conditions in which individuals are likely to engage in feedback-seeking behaviors. These same factors (e.g., the drive to self-evaluate) could, conceivably, instigate the setting of personal goals. In addition, acceptance of external feedback and the acceptance of assigned goals are a concern in both literatures. Furthermore, similar factors, for example, the power of the source and providing a rationale, have been identified as influencing the acceptance of both (Ilgen et al., 1979; Leskovec, 1967; Locke, Latham, & Erez, 1988).

Comparator

Regardless of its source or how it is processed, when feedback is perceived, it is tested (Box 5) against the goal through a psychological process represented by the comparator (Carver, 1979; Miller et al., 1960). There are three results of this comparison process (Carver & Scheier, 1981): (a) the individual is on target toward meeting the goal, (b) the individual is behind schedule, or (c) the individual is ahead of schedule. If a person is on target, no error (Box 6) is detected, and the person, in most instances, will return to his or her previous behavior (Box 7). The failure to detect an error implies that the actions being employed are appropriate and, thus, they will tend to be repeated. There are, however, exceptions. For example, individuals may become bored and want to try something new, or they may anticipate that conditions have changed and, thus, alter their behavior in preparation for those changes (Wood & Locke, 1986).

If the comparison process reveals an error, a response will be initiated in order to correct that error. As with the processing of feedback, the processing of an error need not be conscious. Taylor et al. (1984) pointed out that the acquisition and processing of information can vary from a highly controlled to a virtually automatic series of activities. Similarly, Lord and Hanges (1987) held that the decision mechanism in their model operated differently in different situations. This distinction between conscious and unconscious processing in response to discrepancies is analogous to the distinction made by Carver and Scheier (1981) and Hollenbeck and Brief (1988) between an interrupted versus uninterrupted feedback loop. These positions are also in line with March and Simon’s (1958) routinized and problem-solving responses, as well as the views of cognitive psychologists who have suggested there are two models of processing information, one automatic and one controlled (e.g., Shiffrin & Schneider, 1977).

Reflecting these dual processes, the model in Figure 2 indicates two alternatives following the perception of an error. These two options represent parallel levels of processing, not simply alternative paths for discrepancy reduction. According to Carver and Scheier’s model, the matching-to-standard process usually occurs automatically and unconsciously. Whether or not a discrepancy is perceived consciously is most likely dependant on the salience of the error (Taylor & Fiske, 1978) and whether or not the feedback leading to the error perception was consciously processed (Taylor et al., 1984). Like-
wise, the response to any perceived errors may be either conscious or unconscious.

It is likely that whether or not the response is conscious will depend on whether the discrepancy was consciously perceived (Taylor et al., 1984) and the individual's familiarity with the situation (Lord & Hanges, 1987). Given that feedback, especially from internal or task sources, often is acquired and processed unconsciously (Taylor et al., 1984), frequently the response to discrepancies will be corrected using unconscious scripted responses (Box 8) (Lord & Kernan, 1987; March & Simon, 1958; Schank & Abelson, 1977). In addition, because of the hierarchical structure of goals, processing may be controlled at a particular level, and it may be automatic at lower levels. Controlled processing, because it requires conscious attention, prevents simultaneous controlled processing at other levels. Conversely, automatic processing, by minimizing the need for conscious attention, permits conscious attention to be directed elsewhere.

Unconscious Scripted Response

Scripts are overlearned performance programs, cognitive structures that provide sequences of events for familiar situations (Lord & Kernan, 1987; Schank & Abelson, 1977). Schank and Abelson suggested that individuals have scripts for situations that are frequently encountered and that a script becomes stronger as the sequence is repeated. Scripts also can be tied to the goals of individuals (Lichtenstein & Brewer, 1980; Lord & Kernan, 1987); therefore, many routine work behaviors are executed via scripts. People can adapt to novel situations by utilizing more general plans, the mechanisms that underlie scripts (Schank & Abelson, 1977). A plan is an accumulation of more general information connecting events that have not been encountered frequently enough to be linked in the form of a script. Behavior can initiate from either a plan or a script, and each has equal status in the overall strategy for realizing goals (Schank & Abelson, 1977). Using plans is more difficult because it requires an individual to use considerably more thought and attention. It is likely, therefore, that an experienced salesperson will have a well-developed script for closing a deal, whereas a new salesperson may have only a general plan.

Schank and Abelson also discussed how distractions and interferences can cause the interruption of a script. Script interference results from obstacles in the environment or mistakes on the part of the individual. In either case, the person is in the position of seeking corrective actions. That is, script interruption often will result in the perception of an error and a shift to conscious processing. In well-practiced scripts, certain obstacles or errors will have been encountered often enough for the corrective responses to become scripts themselves. In the example used here, an experienced salesperson may have a subcript for dealing with customers who try to back out of a deal. The other potential interrupters of scripts, distractions, are conditions or actions that result in a temporary or permanent change in the relative importance of the goal. An emergency phone call made to a salesperson who is in the process of closing a deal would be an example of a script distraction.

To summarize the distinctions made between conscious and unconscious information processing, both feedback and goal-performance discrepancies may or may not be recognized, and if processed, they may or may not be consciously perceived. Likewise, the response to a discrepancy and the decision of how to respond may or may not be conscious. If a script exists for resolving a discrepancy, that script will be enacted. If no script is available, planning is required, and the decision process will shift to one of conscious problem solving. The distinction between scripted and conscious responses is important because there is evidence to suggest that goals are more effective when scripted responses are available.

It has been suggested that without well-learned responses, the attentional demands of goals may undermine performance (Wood,
Mento, & Locke, 1987). Given that the capacity for conscious processing is limited, when a script is unavailable for a set of behaviors, a goal that is focusing a person's attention on a task requiring those behaviors may interfere with the conscious processing required to learn or plan those behaviors. Studies employing heuristic tasks (e.g., Earley, Ekergren, & Connolly, 1987) and a meta-analysis of the effects of task complexity (Wood et al., 1987) demonstrate that specific, difficult goals are dysfunctional for novel and complex tasks. Individuals clearly would not have scripts for a heuristic task and would be less likely to have strong scripts for all aspects of a complex task.

**Conscious Response**

If a programed response is unavailable, problem-solving activities directed toward finding an appropriate response will be initiated (March & Simon, 1958). Even though these processes essentially involve rational choice, it is recognized that rationality is bounded and that choice is always exercised with respect to a narrow, simplified perception of reality (March & Simon, 1958). The importance of the decision and the time constraints will influence the degree of rationality that is approached (Lord & Hanges, 1987).

According to Carver and Scheier's (1981) model, when the automatic feedback loop is interrupted, an individual will reassess the likelihood of meeting the goal. This assessment entails processing the available information, and it results in an outcome expectancy, a subjective estimate of the likelihood that the goal can be attained, given the nature of the situation and the available options (Carver, 1979). Outcome expectancies are similar to, but differ subtly from, both performance to outcome expectancies in expectancy theory (Lawler, 1973) and efficacy expectations in social learning theory (Bandura, 1977, 1986). Those differences are discussed in depth both by Carver and Scheier (1981) and by Bandura (1977).

**Attributional Search**

Carver and Scheier (1981) outlined a number of factors that might influence outcome expectancies, including past performance, locus of control, social influence, and attributions. As part of the conscious problem-solving response, individuals will embark on attributional searches (Box 9) to develop causal explanations for being unable to meet their goals (Carver & Scheier, 1981). This search may entail seeking additional feedback. Based on this causal analysis, individuals form new outcome expectancies that may or may not differ from previous expectations. It has been demonstrated that individuals do engage in spontaneous attributional searches and that such searches are most likely to happen when an unexpected event occurs (i.e., when expectancies are disconfirmed) (e.g., Pyszczynski & Greenberg, 1981; Wong & Weiner, 1981).

In the area of organizational behavior, researchers have relied primarily on the model presented by Weiner et al. (1971). That model posits that there are four main causal elements (ability, effort, luck, and task difficulty) representing the influence of two orthogonal dimensions (stability and locus). More recently, a third dimension, controllability, has been added (Weiner, 1985). In addition, unstable, internal, controllable factors (i.e., effort) can be broken down further by making the distinction between the amount of effort and the direction of that effort (Taylor et al., 1984).

The primary dimension of interest relating to the reevaluation of outcome expectancies is stability (McMahan, 1973). Weiner, Heckhausen, Meyer, and Cook (1972), for example, found that ascriptions of an outcome to stable factors produce greater shifts in expectancy, increments following success, and decrements following failure, than do ascriptions to unstable causes. If a salesperson is behind in meeting a quota and attributes that failure to deficiencies in the product line (i.e., a stable factor), it is likely that the outcome expectancy for meeting that quota will
fall. If, instead, the salesperson attributes such failure to unstable factors (e.g., to bad luck or to not trying hard enough), changes in expectancy will be smaller. Similarly, if a salesperson is ahead of schedule, his or her outcome expectancy would be expected to increase more if that success is attributed to ability than if it is attributed to a couple of lucky deals.

**Subjective Expected Utility**

Although previous control theory models have explicitly included the role of outcome expectancies, both Taylor et al. (1984) and Carver and Scheier (1981) also suggested that the importance, or value, of goals plays a role. Taylor et al. (1984), for example, suggested that task persistence is determined by factors that would affect the attractiveness of goal attainment. Similarly, Campion and Lord (1982) suggested that valences (as well as expectancies and attributions) may have an impact on motivation through their impact on goal commitment or goal change. Other authors have suggested using both expectancies and attractiveness to predict goal commitment (e.g., Hollenbeck & Klein, 1987; Mento, Cartledge, & Locke, 1980). Therefore, using an expectancy theory, or, in more general terms, a subjective expected utility (SEU) framework (Edwards, 1961), to predict the decision to retain a goal when confronted with a performance-standard discrepancy is consistent with these authors.

This utility (Box 10) is construed to be a multiplicative function of the attractiveness of goal attainment and the expectancy of attaining that goal. Other things being equal, individuals are more likely to remain committed to a goal when they have a high expectancy of reaching it and when their perceived value of goal attainment is high (Matsui, Okada, & Mizuguchi, 1981; Mento et al., 1980). Although the probability of goal attainment may be less for difficult goals, this is often offset by their correspondingly higher valence (Campbell, 1982; Matsui et al., 1981). Carver and Scheier (1981) concluded that the judgment regarding outcome expectancies was a critical decision point, with responses falling into one of two categories: renewed effort or withdrawal. In the current model, this decision is a function of the SEU of goal attainment. Given that numerous authors have suggested that the choice of personal goals is influenced by expectancy and attractiveness (e.g., Mento et al., 1980), initial goal choice is also believed to be a function of the SEU of goal attainment.

**Individual and Situational Factors**

The judgments that determine SEU are, in turn, influenced by a host of individual and situational characteristics (Box 11) in addition to causal attributions (Campion & Lord, 1982; Taylor et al., 1984). Outcome expectancies, for example, may be influenced by individual factors, such as ability and past experiences, as well as by situational causes, including social comparisons and performance constraints. Likewise, the attractiveness of goal attainment will be influenced by many individual (e.g., needs, values, higher order goals) and situational (e.g., reward structure) considerations. More complete lists of such factors have been outlined elsewhere (e.g., Campbell, 1982; Hollenbeck & Klein, 1987; Taylor et al., 1984). Although not explicit in Figure 2, these individual and situational factors have direct effects on behavior and performance and may influence other elements in the model (e.g., attributions).

**Response Decision**

If the resulting SEU of goal attainment is high, continued effort toward that goal should result. If, however, the SEU is low, the predicted response is withdrawal. A similar position was taken by Lewin, Dembo, Festinger, and Sears (1944), who stated that although the decision for a person to continue or stop may be influenced by a large number of factors, stopping or not stopping will ultimately depend on the force toward that goal. If the SEU is low, the withdrawal impetus can be expressed either behaviorally or cognitively (Carver & Scheier, 1981). The primary withdrawal response is to leave the
situation, if such a response is possible and not associated with aversive consequences. Laboratory research indicates that physical withdrawal from a situation is likely when goal-performance discrepancies are combined with negative expectancies, especially for persons high in self-focus (Carver et al., 1979; Steenbarger & Aderman, 1979).

An individual may withdraw either from the particular task causing the discrepancy or from the job. If a salesperson is having difficulty with only the bookkeeping aspects of the job, finding someone else to complete those duties is a more probable response than leaving the job. If withdrawal from the problematic task is not possible, or if that task is central to the job, withdrawal from the job would be expected, contingent on the perceived consequences of leaving. When physical withdrawal from the situation is precluded, the withdrawal impetus may be expressed mentally. Essentially, this cognitive withdrawal involves giving up, resignation to failure, and disengagement from the situation. An individual who has withdrawn mentally would be expected to reduce his or her efforts, to simply go through the motions, and to avoid feedback that would increase the salience of the discrepancy (Carver & Scheier, 1981).

Cognitive Reactions. Predicting the specific response of an individual who chooses to persist is complicated because persistence may result in cognitive (Box 12) and/or behavioral (Box 13) changes. Cognitive reactions may take the form of changes in goal commitment, changes in the level of the goal, or changes in the goal itself (Campion & Lord, 1982; Taylor et al., 1984). In general, commitment toward a goal could increase, remain the same, or decrease. In instances in which the SEU of goal attainment changes, but the force toward the goal remains sufficiently high for the individual to persist and is still greater than the force toward alternative goals, there should be no change in the goal, but an incremental change in goal commitment. For example, assume that the motivational force toward a quarterly quota drops because the expectancy of meeting that goal is lowered following a poor first month. That goal may still be retained if the SEU of the goal is still higher than that toward an easier goal. Yet the force toward that goal is not as strong as it was, and this change should be evident in the commitment the individual demonstrates toward that goal.

In instances in which the SEU changes to the extent that the force toward a goal becomes less than that toward an alternative goal, the individual should abandon the original goal and replace it with the goal with the greatest SEU. In the above example, if the expectancy of attaining the sales quota drops to the extent that its attractiveness cannot compensate (i.e., the SEU of the easier goal becomes greater than that of the original goal), it is likely that the individual will lower his or her goal. In addition to changing the level of the original goal, the individual could replace that goal with a different goal. Another possible cognitive reaction would be to deny or distort the feedback so that the previously perceived error is rationalized (Lord & Hanges, 1987).

In general, cognitive changes are less likely to occur than behavioral changes. Campion and Lord (1982) suggested that cognitive changes are longer term, secondary responses and that different behavioral responses would be tried before changing goals. Similarly, March and Simon (1958) proposed that individuals will first try to find or develop a satisfactory performance program, but if unsuccessful, will try to relax the criteria. The explanation for this lies in the hypothesized causes of the above cognitive changes—changes in the SEU of goal attainment. The value of attaining a particular goal is likely to be a fairly stable factor in the short term. In the example used here, the attractiveness of meeting an established sales quota, because of its instrumentality in obtaining other outcomes (e.g., a bonus, promotion, praise), is unlikely to change during the performance period.

Also, outcome expectancies will tend to remain constant, depending on attributions, as long as the individual believes that an untried
behavioral response will remedy the situation. If, for example, a salesperson feels it is possible to catch up by trying harder or by changing strategies, or if he or she is confident that luck will change, it is likely that outcome expectancies will remain high. As alternative behavioral responses are exhausted, the likelihood of making a stable attribution increases, enhancing the likelihood that expectancies will drop (Taylor et al., 1984). Support for this position was provided by Campion and Lord (1982), who found that the number of failures participants experienced was an important determinant of their response. This relative stability of SEUs in the short run also suggests that changes in commitment are more likely than changes in goals.

Behavioral Reactions. Behavioral reactions may occur either as a result of cognitive changes or in the absence of cognitive changes. That is, a change in goal commitment, or goal change, will likely require corresponding changes in behavior. The absence of cognitive change, however, also indicates persistence with behavioral changes needed to reduce the perceived discrepancy. There are two primary ways for an individual to change behaviors: the intensity of effort can be altered (i.e., trying harder) or the direction of behavior can be changed (i.e., trying a different strategy) (Carver & Scheier, 1981; Lord & Hanges, 1987; Taylor et al., 1984). For example, a salesperson either can work more hours and make more calls per week or he or she can change the type of calls (e.g., focusing on new customers at the expense of follow-up calls). Furthermore, an individual may change both the intensity and direction of his or her efforts. Another possible behavioral reaction would be to react against the system (Taylor et al., 1984).

The choice between altering the intensity or the direction of behavior is hypothesized to depend upon the causal attributions made for past performance. Kelley (1973) suggested that attributions have a more direct influence on behavior than was discussed earlier, positing that causal attributions influence decisions among alter-native courses of action. Along these lines, Taylor et al. (1984) hypothesized that “changes in the direction of behavior will only occur when the individual attributes past performance to incorrect behavioral strategies” and that “if past failure is attributed to a noncontrollable factor, then changing behavior would not be seen as potentially effective” (p. 107). Whereas the evaluative dimension of feedback is important for the comparison process, it is the descriptive aspect that is important for forming attributions.

Reactions to Positive Discrepancies. In mechanical systems, overshooting a standard is as serious as a negative deviation and results in the same corrective response. In human systems, however, exceeding a standard usually is a desired outcome (Taylor et al., 1984). Carver and Scheier (1981) and Hollenbeck (in press) have suggested that reactions to positive errors will not be as extreme or direct as with a negative error because the dissatisfaction resulting from failing to meet a goal may not be present. Although the reaction to a positive discrepancy may not be as strong, the cognitive processes determining that response should be the same. Given a positive discrepancy, if one feels that the higher level of performance can be maintained and if that level of performance is perceived as more attractive, an upward goal change would be expected. If, however, the SEU of this higher level of performance is not greater than that of the current goal, no such change would be expected. Under these conditions, direct action to reduce the discrepancy is unlikely, but its reduction may occur as the indirect result of directing attention and effort elsewhere (Carver & Scheier, 1981; Hollenbeck, in press). In some situations, however, the SEU of the higher performance level may be lower, for instance, with a just-in-time inventory system or where there are strong group norms regarding rate busting. In these situations, it is likely that active steps will be taken to reduce the discrepancy.

Assume that a salesperson is well ahead of schedule after the first month in meeting a quar-
tering it in response to perceived discrepancies (Powers, 1973). Campion and Lord (1982), for example, found that following failure, increasing exam goals (a subgoal) and increasing effort (a subsubgoal) were common student responses, whereas lowering course grades (the end goal) occurred only after repeated failure. One explanation is that lower level goals typically will have lower SEUs because their attractiveness is based largely on their instrumentality in achieving higher level goals. This hierarchical structure also suggests that when goal progress is impeded or when a goal is changed, other goals in the hierarchy will require adjustment. If initial subgoals are not met, subsequent subgoals may be raised in the hopes of catching up and eventually meeting the higher order goal (Campion & Lord, 1982). The other alternative is to lower the higher order goal and, correspondingly, to lower the remaining subgoals.

Individuals have multiple goal hierarchies for the multiple work and nonwork roles they face. The operation of work-related goal hierarchies cannot be completely understood independent of nonwork hierarchies. When an individual has competing goals, either within or across goal hierarchies, there is competition for the individual's time and effort (Miller et al., 1960). It is therefore important to understand where, both within and across goal hierarchies, a person will focus his or her attention. It has been suggested that within Power's (1973) hierarchy attention typically is directed at the program level because behavioral sequences (i.e., scripts) are initiated at this level (Carver & Scheier, 1981; Hollenbeck, in press; Schank & Abelson, 1977). That is, a person's attention should be directed toward the level just above his or her operating script. If that script were interrupted, attention would shift down a level. If, for example, a salesperson is employing a closing-a-deal script with a customer, his or her attention will be directed elsewhere, perhaps to planning the rest of the day's schedule. If, however, that script is interfered with, the salesperson's attention will shift to dealing with the customer. Being able to

Hierarchical Nature of Control Loops

As noted earlier, any complex activity requires many subsidiary functions, and a number of theorists have suggested that behavior is hierarchically organized into goal-subgoal relationships (e.g., Powers, 1973). Locke, Cartledge, and Knerr (1970) suggested that when individuals have goals on tasks, they will set subgoals according to their perceived instrumentality in achieving the end goal. The force toward an end goal should therefore be related to the force toward subgoals through its influence on the attractiveness of attaining that subgoal. This suggests that a salesperson who does not perceive meeting quarterly sales goals as important for the attainment of higher order goals may quickly abandon those subgoals in the face of adversity.

It has been suggested that the lower the subgoal, the more flexible the individual will be in
perform tasks automatically allows the diversion of attention from those tasks to other concerns, either higher in the same goal hierarchy or in some other hierarchy.

With competing goals, attention will be directed to the most salient hierarchy at the time (Taylor & Fiske, 1978). Factors influencing salience include situational cues (Taylor et al., 1984), the relative importance of the goals, and the magnitude of the perceived discrepancies. If a salesperson perceives equal discrepancies in goals for completing paperwork and making follow-up calls, and if follow-up calls are viewed as more important, the salesperson will focus his or her attention on calls rather than paperwork. Likewise, if the larger discrepancy is perceived in spending time with family than in meeting a sales quota (assuming at least equal importance), it is likely that the salesperson would attend to the nonwork hierarchy. Schank and Abeison's (1977) notion of script distractions also is relevant here. A script distraction changes the relative salience of goals, and attention will shift to the hierarchy causing the distraction. For example, if a salesperson employing a work-related script receives a phone call indicating that his or her child is ill, the script will be abandoned and his or her attention will shift from the salesperson hierarchy to a parent hierarchy.

Summary of the Integrated Model

Numerous hypotheses have been implicitly and explicitly suggested in delineating the proposed model. These propositions are reiterated in Table 1. Also, the primary theoretical perspectives that the hypotheses were derived from are indicated in this table. In viewing these hypotheses, note that the primary value of a meta-theory is its ability to account for the hypotheses of the perspectives it incorporates. Although this is clearly the case, the majority of the hypotheses presented are derived from control theory. In addition, many of these have not been stated in previous models.

Table 1
Summary of Propositions Derived From the Model and Their Origins

<table>
<thead>
<tr>
<th>Proposition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposition 1:</td>
<td>Difficult goals will lead to higher levels of performance (G).</td>
</tr>
<tr>
<td>Proposition 2:</td>
<td>Specific goals will lead to higher levels of performance and less performance variance across individuals (G).</td>
</tr>
<tr>
<td>Proposition 3:</td>
<td>Goals and feedback interact in influencing performance (C).</td>
</tr>
<tr>
<td>Proposition 4:</td>
<td>Goal setting in the absence of feedback will result in feedback-seeking behavior, and feedback in the absence of goals will result in spontaneous goal setting (C).</td>
</tr>
<tr>
<td>Proposition 5:</td>
<td>Specific feedback will lead to higher levels of performance (F) and less performance variance across individuals (C).</td>
</tr>
<tr>
<td>Proposition 6:</td>
<td>Moderately frequent feedback (F) and moderately short-term goals (C) will result in the greatest performance improvements.</td>
</tr>
<tr>
<td>Proposition 7:</td>
<td>Overly specific feedback (F) and overly specific goals (C) will be dysfunctional in novel settings.</td>
</tr>
<tr>
<td>Proposition 8:</td>
<td>The same factors initiate feedback-seeking behavior and spontaneous goal setting (C).</td>
</tr>
<tr>
<td>Proposition 9:</td>
<td>The same factors relate to the acceptance of feedback and the acceptance of goals (C).</td>
</tr>
<tr>
<td>Proposition 10:</td>
<td>Whether or not feedback regarding a goal is noticed depends upon both the importance of the goal and self-focus (C).</td>
</tr>
<tr>
<td>Proposition 11:</td>
<td>The salience of feedback will influence whether or not it is processed consciously (I).</td>
</tr>
<tr>
<td>Proposition 12:</td>
<td>The salience of an error and the way feedback was processed will influence whether or not the discrepancy is consciously perceived (I).</td>
</tr>
<tr>
<td>Proposition 13:</td>
<td>If no error is detected, neither goals nor behavior will change. If an error is perceived, a response will be initiated to try and correct it (C).</td>
</tr>
<tr>
<td>Proposition 14:</td>
<td>If a script exists for a discrepancy, that script will be enacted. If a script is unavailable or interrupted, the decision process will shift to one of conscious problem solving (I).</td>
</tr>
<tr>
<td>Proposition 15:</td>
<td>Goal setting is more effective when scripted responses are available (C).</td>
</tr>
</tbody>
</table>
Table 1 (continued)
Summary of Propositions Derived From the Model and Their Origins

Proposition 16: When consciously responding to errors, individuals will embark on attributional searches (A).

Proposition 17: Attributions to stable causes will lead to greater changes in outcome expectancies than attributions to unstable causes, positive shifts following positive errors, negative following negative errors (A).

Proposition 18: The decision to persist versus the decision to withdraw is a function of the SEU of goal attainment, as is the initial choice of a goal (E).

Proposition 19: The SEU of goal attainment is a multiplicative function of outcome expectancies and the attractiveness of goal attainment (E).

Proposition 20: The judgments that determine SEU are influenced by a host of individual and situational factors (E).

Proposition 21: The SEU of goal attainment is related to goal commitment, and changes in SEU relate to changes in commitment (E).

Proposition 22: When the SEU of a goal becomes less than the SEU of an alternative goal, the individual will change goals (E).

Proposition 23: Cognitive changes are less likely to occur initially than are behavioral changes, and changes in goals are less likely to occur initially than are changes in commitment (C).

Proposition 24: Causal attributions to the amount of effort expended or the distribution of that effort will be related to subsequent changes in effort expenditure or distribution (A).

Proposition 25: Individuals employ the same processes in reacting to positive discrepancies as to negative discrepancies (C).

Proposition 26: The SEU of an end goal will influence the SEU of the subgoal through its influence on the attractiveness of the subgoal's attainment (E).

Proposition 27: Within a goal hierarchy, higher order goals have higher SEUs than do lower order goals and, therefore, are more resistant to change (E).

Proposition 28: Any change in a goal will result in accompanying changes in lower and/or same-level goals to maintain equilibrium in the hierarchy (C).

Proposition 29: People have multiple goal hierarchies reflecting multiple role demands (C).

Proposition 30: Attention is given to the most salient hierarchy at a particular time (C).

Proposition 31: The relative importance of the end-goal and the magnitude of the perceived discrepancy influence the saliency of a goal hierarchy (C).

Proposition 32: Within a hierarchy, attention is at the level above an operating script (C).

Proposition 33: If there is a distraction from a script, attention will be shifted to the hierarchy causing the distraction (C).

Note. Letters in parentheses indicate the primary theoretical perspective from which the hypothesis is derived: A = attribution theory, C = control theory, E = expectancy theory, F = feedback, G = goal setting, and I = information processing.

Comparisons with Other Models

The model in Figure 2 is an integration of several theories of motivation as well as several previous control theory models. The specific ways that the current model integrates those models and theories are examined below.

Previous Control Theory Models

In presenting the integrated control theory model, the models of Carver and Scheier, Lord, Taylor, and Hollenbeck have been referred to frequently. To indicate precisely how those models differ from each other and how the current model combines their positions, these models are contrasted in Table 2. These models differ primarily in (a) their orientation, (b) where the decision mechanism is placed, (c) the nature of the decision processes, (d) the determinants of conscious versus unconscious processing, (e) the primary consequences of the decision mechanism, (f) the general and specific responses to discrepancies, and (g) their treatment of positive discrepancies. As is evident in Table 2, the current model consolidates the different positions of the previous models on these issues.
<table>
<thead>
<tr>
<th>Issue</th>
<th>Cybernetics</th>
<th>Carver &amp; Scheler's</th>
<th>Lord's</th>
<th>Taylor's</th>
<th>Hollenbeck's</th>
<th>Current Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>Mechanical Systems</td>
<td>Self-Regulation</td>
<td>Goal-Setting Processes</td>
<td>Feedback Processes</td>
<td>Organizational Behavior</td>
<td>Motivation</td>
</tr>
<tr>
<td>Placement of the Decision Mechanism</td>
<td>No decision mechanism</td>
<td>Outside the feedback loop,</td>
<td>Within the feedback loop</td>
<td>Same as Lord's</td>
<td>Same as Carver &amp; Scheler's</td>
<td>Within the feedback loop (Box 10)</td>
</tr>
<tr>
<td>Decision Processes</td>
<td>Not applicable</td>
<td>Unconscious: Routinized</td>
<td>Unconscious: Automatic</td>
<td>Unconscious:</td>
<td>Unconscious:</td>
<td>Unconscious:</td>
</tr>
<tr>
<td>Determinants of Conscious Processing</td>
<td>Not applicable</td>
<td>Intuition</td>
<td>Familiarity with the situation</td>
<td>Familiarity with the situation</td>
<td>Discrepancy salience</td>
<td>Familiarity with the situation</td>
</tr>
<tr>
<td>Primary Consequence of Decision Processes</td>
<td>Not applicable</td>
<td>Persistence versus</td>
<td>Cognitive versus behavioral</td>
<td>Same as Lord's</td>
<td>Same as Carver &amp; Scheler's</td>
<td>Persistence versus withdrawal: If</td>
</tr>
<tr>
<td>Responses to Perceived Discrepancies</td>
<td>Mechanical</td>
<td>Behavioral: Persistence versus withdrawal</td>
<td>Behavioral: Amount of effort</td>
<td>Behavioral: Absenteeism</td>
<td>Behavioral: Direction of effort</td>
<td>Behavioral:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Affective: Satisfaction</td>
<td>Change strategy</td>
<td>Voluntary turnover</td>
<td>Amount of effort</td>
<td>Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cognitive: Change</td>
<td>Affective: Satisfaction</td>
<td>Persist versus quit</td>
<td>Reaction against system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>standard</td>
<td>Organizational commitment</td>
<td></td>
<td>Cognitive:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Distort feedback</td>
<td></td>
<td></td>
<td>Distort feedback</td>
</tr>
</tbody>
</table>

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Table 2 (continued)
A Comparison of Previous Control Theory Models and the Proposed Model

<table>
<thead>
<tr>
<th>Issue</th>
<th>Cybernetics</th>
<th>Carver &amp; Scherer's</th>
<th>Lord's</th>
<th>Taylor's</th>
<th>Hollenbeck's</th>
<th>Current Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Versus Negative Discrepancies</td>
<td>Reactions to positive discrepancies are treated in the same manner as negative discrepancies</td>
<td>Reactions to positive discrepancies may not be as extreme or direct as for negative discrepancies, but the processes are the same</td>
<td>Reactions to positive discrepancies may not be as important, depending on the nature of the goal</td>
<td>Change standards</td>
<td>Affective: Satisfaction</td>
<td>Same as Carver &amp; Scherer's</td>
</tr>
</tbody>
</table>

Motivation Theories Explicitly Integrated

Goal Setting. Adopting a control theory framework provides explanations for important aspects of goal setting, including the origins of personal goals, the importance of goal commitment, and the ways that goal characteristics (e.g., specificity, difficulty) affect behavior (Campion & Lord, 1982). Control theory also addresses goal-setting issues that, although identified as important, have been virtually unexplored (Locke et al., 1981). These include the existence and interplay of subgoals, multiple competing goals, goal hierarchies, task strategies, and the modification of goals over time. These processes also highlight control theory’s conceptualization of goals as dynamic antecedents of behavior (Campion & Lord, 1982).

Feedback. Control theory, similarly, can account for findings in the feedback literature, for example, the positive relationships between specificity and frequency of feedback and performance (Ilgen et al., 1979). The model presented here also takes into consideration many other aspects from feedback research, including multiple dimensions of feedback, multiple sources for feedback, feedback-seeking behavior, selective perception of feedback, and conscious and unconscious processing of feedback. In addition, control theory predicts the goal by feedback interaction consistently found in the literature and suggests that goals and feedback are dual elements of a single motivational process.

Expectancy Theory. A criticism of expectancy theory has been its inability to account for meaningful amounts of variation in behavior (Campbell & Pritchard, 1976). Expectancy theory is not, however, designed to predict actual behavior but the force to act (Parker & Dyer, 1976). It is better suited, therefore, to account for intentions (i.e., goals) than either effort or performance. Expectancy theory also has been criticized as being overly rational for most situations, and the current model suggests such processes are brought into play only in certain circumstances. In discussing the role of expectancy theory, a fairly simple version has been employed (i.e., outcome expectancy × attractiveness). More complex SEU models (e.g., Lawler, 1973; Naylor et al., 1980) could easily be employed instead.
Attribution Theory. Two major propositions from attribution theory are incorporated in the proposed model, one regarding the reevaluation of outcome expectancies, the other the choice of behavioral responses. There is strong empirical support for these roles from the social psychology literature, but attributions have not proven successful in predicting specific behaviors (Weiner, 1985). One explanation is that attributions have not been measured specifically enough to predict specific actions (Weiner, 1983). The conditional use of attributions in the current model also is consistent with the research about when attributional searches are most likely to occur.

Other Theories and Constructs Integrated

Social Learning Theory. Some authors, interested in self-regulation, have built upon social learning (or social-cognitive) theory rather than control theory. There are a number of parallels between these two perspectives, including the similarities between efficacy expectations and outcome expectancies alluded to earlier. According to social learning theory, motivation involves a cognitive process in which goals are compared with knowledge about one's performance (Bandura, 1977, 1986; Bandura & Cervone, 1983, 1986). In addition, perceived negative discrepancies are viewed as creating dissatisfaction and motivating corrective changes. Also, according to social learning theory, people process, weigh, and integrate diverse sources of information concerning their capabilities, and they regulate their behavioral choices and effort expenditure accordingly. All of the above positions are consistent with the proposed model. In addition, social comparison is explicitly recognized in the proposed model as a situational factor affecting outcome expectancies and, in turn, goal choice.

Other Theories of Motivation. To the extent that other theories of motivation have been integrated into the four perspectives incorporated into the proposed model, those theories can be assimilated. For example, Lawler (1973) and others have argued that expectancy theory can explain equity theory concerns if perceived equity is explicitly recognized as a factor affecting the attractiveness of outcomes. Similar arguments have been made regarding need theories. Need theories generally hold that behavior is motivated to satisfy some basic need, be it need for achievement or the need to self-actualize. According to expectancy theory, outcomes become attractive when they can be used to satisfy such needs (Vroom, 1964). In addition, goal-setting theory has explicitly recognized needs and values as influencing goal choice (Locke et al., 1981). A final example would be the arguments of those who have claimed that findings from reinforcement theory can be explained by goal setting and feedback (e.g., Locke, 1977).

Satisfaction. As is evident in Table 2, control theory also predicts affective reactions. These reactions depend primarily on the direction and magnitude of the goal-performance discrepancy and the importance of the goal (Taylor et al., 1984). Typically, feedback indicating that one is at or beyond the standard will yield positive emotions, whereas perceiving one is below standard will result in negative affect (Locke et al., 1970; Taylor et al., 1984). The more valued the goal, the stronger the reaction. Outcome expectancies and attributions also have been hypothesized to moderate the magnitude of the resulting emotions. If having perceived a negative discrepancy, one maintains a high outcome expectancy, dissatisfaction will be considerably less than if the expectancy is low (Carver & Scheier, 1981). Regarding attributions, emotional reactions are thought to be amplified when success or failure is attributed to internal causes and diminished when attributions are external (Weiner, Russell, & Lerman, 1979).

Escalation to Commitment. According to Staw (1982), escalation of commitment to a failing course of action may occur when there are a series of goal-directed behaviors, negative feedback, and the opportunity to commit further effort to goal attainment. These components cer-
tainly are present in the current model. Carver and Scheier (1982) similarly discussed the dysfunctional consequences of individuals who remain committed to standards that cannot be obtained. Such a reaction occurs when expectancies remain unrealistically high following failure. This could result from selective perception of feedback, distortion of feedback, and/or inaccurate attributions for failure. Cognitive dissonance theory (Festinger, 1957) would suggest that individuals use responses such as these to reduce the dissonance following disconfirmed expectancies, rather than admit that an inappropriate goal was chosen.

**Other Constructs.** The hypotheses regarding physical and mental withdrawal have implications for organizational withdrawal behaviors such as organizational commitment, absenteeism, and turnover, and Hollenbeck’s (in press) model focuses on such behaviors. In addition, many models of these withdrawal behaviors (e.g., Mowday, Porter, & Steers, 1982; Steers & Rhodes, 1978) include the affective and cognitive elements discussed in the proposed model. The elaborated operation of the proposed feedback loop also is compatible with theories of social cognition, information processing, and decision making. Examples include the encoding of behavioral specifications, the coexistence of controlled and automatic processes, and goal-directed, script-based responses.

**Other Levels of Analysis.** Even though the proposed model is concerned solely with personal goals, this is not a serious limitation. It has been argued that all concepts of motivation are essentially concepts of self-regulation (Bandura, 1986; Carver & Scheier, 1981; Manz, 1986). Furthermore, often the effects of externally originating goals are recognized as mediated by personal goals (e.g., Garland, 1983). Thus, another advantage of the control theory perspective is that it shifts the focus of attention not only to the individual but also to the individual’s self-regulation of his or her behavior. In addition, the proposed model, and control theory in general, could be modified and employed at other levels of analysis (e.g., work groups, organizations) because goals and feedback are also relevant at those levels.

**Conclusions**

Control theory is well suited as a framework for the development of a metatheory for understanding work motivation. An integrated model of motivation should aid future conceptual development, research, and application by providing a more general framework for understanding motivation while guiding the refinement of the component theories. The model presented here is a useful heuristic that provides an integration on two levels. First, a control theory perspective explicitly integrates goal setting, feedback, expectancy, and attribution theories as well as implicitly integrating several other theories and constructs such as social learning theory, need theories, and information processing. Second, the proposed model unifies the work of previous authors who have applied control theory to motivated behavior. Even in its expanded form, control theory remains a simple framework while encompassing all of these theories, constructs, and perspectives.

In addition, a control theory model of motivation is advantageous for several other reasons. First, it focuses attention on the cognitive processes underlying motivation. In articulating these cognitive processes, control theory provides a structure for the simultaneous application of different cognitive processes at different levels of attention. Hierarchically organized feedback loops provide an explanation of how automatic and conscious processes operate simultaneously to initiate and direct behavior. Second, control theory focuses attention on the self-regulation of behavior. Although most motivational theories are aimed at understanding the behavior of individuals, they generally emphasize the effects of external influences (e.g., providing goals, incentives) on motivation, not the individual’s self-regulation in response to
those influences. Both of the above further differentiate the integrated model from the component theories it incorporates.

Finally, numerous propositions can be derived from the integrated model regarding (a) the nature of goals and feedback; (b) cognitive, behavioral, and affective reactions over time to goals, performance, and feedback; and (c) the role of attributions, expectancies, and goal hierarchies in determining those reactions. These propositions, as a whole, could not be derived without the control theory perspective (Lord & Hanges, 1987). As is evident in Table 1, although some of the hypotheses could be derived from expectancy theory and others from attribution, feedback, or goal setting, none of these theories alone can account for all of the propositions. Furthermore, none of those four theories, either alone or in concert, are well suited to predict the functioning of goal hierarchies, multiple and competing goals, or the modifications of goals over time.

Therefore, even though the current model integrates several other motivational perspectives, it is much more than a simple aggregation of the perspectives it incorporates. This is evident in the number of hypotheses presented in Table 1 that are unique to control theory. As a result, control theory generates research programs that would not emerge from either goal-setting or the other component theories. Examples of these programs would include examining the links between motivation and learning (Lord & Kernan, 1987) and between work attitudes and goal-based withdrawal behaviors (Hollenbeck, in press). Control theory also generates research examining the functioning of goal hierarchies, multiple and competing goals, and the modifications of goals over time. Though the hypotheses derived from these programs may not contradict the component theories, it is likely that they would not emanate from those perspectives.

Similarly, the propositions in Table 1, taken as a whole, could not have been derived from any one of the previous control theory models. This is partly because of the differing orientations of those authors, and it is also because of the unique contributions of the current model. Specifically, the current model goes beyond past control theory models in specifying (a) the implications of viewing goals and feedback as dual processes; (b) the nature, determinants, and consequences of conscious and unconscious information processing; (c) the role of expectancy and attribution theories; (d) the antecedents of and relationship between behavioral and cognitive reactions; and (e) the operations of goal hierarchies and the direction of attention within hierarchies and across competing hierarchies. The result is an integrated, dynamic, and parsimonious model that focuses on self-regulation and the underlying cognitive mechanisms of motivation.

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