Goal Theory vs. Control Theory: Contrasting Approaches to Understanding Work Motivation[1]

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Control theory has been propounded as an original and useful paradigm for integrating a number of theories of human (especially work) motivation. This paper challenges that claim. First, it is shown that the original, mechanical control theory model is not applicable to human beings. Second, it is shown that the two approaches used by control theorists to remedy its limitations did not succeed. One approach involved incorporating propositions drawn from other theories with the result that there was nothing distinctive left that was unique to control theory. The other approach involved broadening the scope of control theory by adding deduced propositions; however, these propositions were inconsistent with what was already known about the phenomena in question based on empirical research. The control theory approach to theory building is contrasted with that of goal setting theory (Locke & Latham, 1990). Goal-setting theory is a "grounded theory" (Glaser & Strauss, 1967) which evolved from research findings over a 25-year period. Goal theory developed in five directions simultaneously: validation of the core premises; demonstrations of generality; identification of moderators; conceptual refinement and elaboration; and integration with other theories. It is hypothesized that the grounded theory approach is a more fruitful one than the approaches used by control theory.

In recent years control theory has been propounded by a number of writers as a viable, all-encompassing model for studying human (or at least

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work) motivation (Campion & Lord, 1982; Carver & Scheier, 1982; Hyland, 1988; Klein, 1989; Lord & Hanges, 1987; Powers, 1973). It has been argued further that it explains the findings of many motivation experiments (such as those of goal-setting theory), and that it generates new, unique hypotheses about human motivation, thus justifying its status as a separate theory or theoretical model. In this paper I will show why control theory, in its original form, is not an adequate model for the study of human (or work) motivation. Further I will show that attempts by control theorists to remedy the deficiencies of the original model by incorporating the content of other theories or making non-data-based deductions have not succeeded in making it a viable model. Finally, I will contrast control theory with goal-setting theory which was developed through a totally different process.

CONTROL THEORY

Any theory that wants to lay claim to being a theory must, as a minimum, have one or more core premises or propositions which give the theory identity and distinguish it from other competing or related theories. Without such a premise, a theory is literally nothing in particular, i.e., empty. The original, core premise of control theory was that the negative feedback loop represented the fundamental unit of human action and motivation. The negative feedback loop idea originated with cybernetics (Wiener, 1948) and was brought to the behavioral sciences by Miller, Galanter, and Pribram (1960).

This loop is shown in Fig. 1. Using the language of control theory, there is an effector which produces output. This output becomes input to a detector and is then compared to a standard by a comparator. Any deviation between the original output and the standard (called a discrepancy or deviation) is fed back into the system as (effector) input and leads to an automatic adjustment by the effector to reduce the deviation. The paradigm case of the negative feedback loop is a thermostatically controlled heating system. The system (effector) puts out air at a certain temperature which is measured by a thermometer (detector). This reading is compared with the thermostat setting (standard) and fed back into the system. If there is no deviation, the system keeps running as is. If the temperature gets too high, it cuts off, and when the temperature gets too low, it cuts on again. Every "action" of the system is directed toward maintaining zero deviation between the thermometer reading and the thermostat setting.
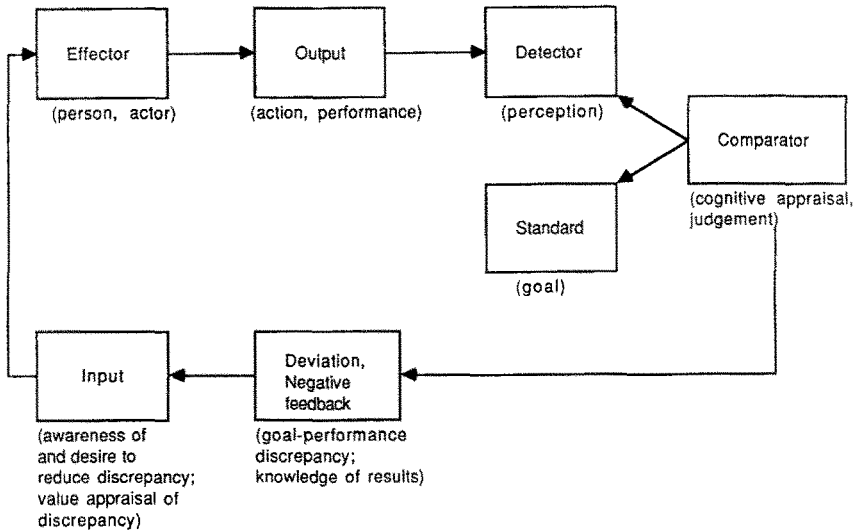
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  ┌──────────┐      ┌──────────┐      ┌──────────┐
  │ Effector │─────▶│  Output  │─────▶│ Detector │
  └──────────┘      └──────────┘      └──────────┘
 (person, actor)  (action, performance)  (perception)        ┌──────────────┐
                                                             │  Comparator  │
                                                             └──────────────┘
                                      ┌──────────┐          (cognitive appraisal,
                                      │ Standard │           judgement)
                                      └──────────┘
                                        (goal)

  ┌──────────┐      ┌──────────────┐
  │  Input   │◀─────│  Deviation,  │◀──────────────
  └──────────┘      │  Negative    │
                    │  feedback    │
 (awareness of      └──────────────┘
 and desire to      (goal-performance
 reduce discrepancy;  discrepancy;
 value appraisal of   knowledge of results)
 discrepancy)
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Fig. 1. The negative feedback loop (machine terms are in boxes, human counterparts in parentheses).

Cybernetics, of course, was designed to describe "self-regulating"[3] mechanical systems. To apply the same model to humans, it was necessary to show that there were direct similarities or parallels between machine concepts and the concepts we use to describe human consciousness and human action. Thus the effector was asserted to be the person, the output to be her actions or performance, the detector her senses or sense perception, the standard her goals, the comparator her cognitive judgment, and the deviation her goal-performance, discrepancy, or knowledge of results. The adjustment of the machine to the new input was taken to be analogous to the person's decision to reduce or eliminate the discrepancy by appropriate action. Hyland (1988) even included an "amplifier" in his model which was claimed to measure "error sensitivity" which he claimed was analogous to goal commitment. He also included expectation and memory, calling them "symbolic control loops."

[3]The term "self-regulation" applies only metaphorically and not literally to mechanical systems. The actual regulation of such systems is based on the mechanisms which humans *install* in such systems and is not integral to the systems' own goals since such systems have no goals of their own (see Binswanger, 1990, and in Locke & Latham, 1990, Chap. 1; see also Locke, 1969).

While its core premise clearly sets off the original version of control theory from other models of motivation, it became immediately apparent to control theorists (and others) that the analogy between the machine model and human action was invalid. For example, human beings do not automatically try to remove all discrepancies between desired and actual outcomes. Human beings are conceptual not mechanical systems. They have the capacity to focus (or not focus) their attention on their output, to change or not change their goals, to acknowledge or not acknowledge discrepancies between output and goals, to process this information in many different ways, and to act or not act on the basis of this knowledge. Further, even when a discrepancy is acknowledged, many different kinds of actions are possible (e.g., leaving the situation, compensating in some other realm, defensive denial, asking others to fix the problem, changing strategies, apathy, aggression, etc.).

Thus to understand how human beings respond to goal-performance discrepancies one needs to know what, if any, discrepancy was actually detected, what appraisal or evaluation was made of it, and what decisions were made in response to it. In short, to understand human action even within the restricted context of a goal-performance discrepancy, one must abandon the mechanical model.

The mechanical model cannot be saved by "cross-labeling," e.g., calling " error sensitivity" the equivalent of commitment as Hyland (1988) does. Nuttin (1984, p. 148) observes, "When behavioral [human] phenomena are translated into cybernetic and computer language, their motivational aspect is lost in the process. This occurs because motivation is foreign to all machines." In short, cross-labeling does not prove that machine and human concepts represent the same thing. For example, commitment is a psychological state or experience, but machine error sensitivity is not.

There is an additional problem with control theory, and it involves the fact that the theory's core revolves solely around discrepancy reduction. To confine the content of a general motivation theory to discrepancy reduction implies adherence to a drive or tension-reduction model which has long been discredited in psychology (Cofer & Appley, 1967) While some control theorists (e.g., Carver & Scheier, 1981) have denied working from a drive-reduction model, such a model is implicit in control theory simply because it makes removing discrepancies the primary motive of action. Another control theorist, Hyland (1988, p. 643), states explicitly that the "experiential component of detected error has been called *tension stress*." If tension-reduction or removal of discrepancies were peoples' major motive, then the simplest action for them to take (short of suicide) would be to adjust their goal or standard to their prior performance, thus

obviating the need for any action to reduce the discrepancy. Or better yet, they would choose no standards at all so that any output would be as good as any other. But these alternatives are clearly at variance with how people usually act.

Human action is not initiated by discrepancy reduction but by *discrepancy creation*. To quote Bandura (1990, p. 355),

> Human self-motivation relies on both *discrepancy production* and *discrepancy reduction* . . . It requires *proactive* control as well as *reactive feedback* control. People initially motivate themselves through proactive control by setting themselves valued challenging standards that create a state of disequilibrium and then mobilizing their effort on the basis of anticipatory estimation of what it would take to reach them. After people attain the standard they have been pursuing, they generally set a higher standard for themselves. The adoption of further challenges creates new motivating discrepancies to be mastered. Similarly, surpassing a standard is more likely to raise aspiration than to lower subsequent performance to conform to the surpassed standard. Self-motivation thus involves a dual cyclic process of disequilibrating discrepancy production followed by equilibrating discrepancy reduction.

Nuttin (1984), p. 145) has made a similar observation:

> The behavioral process . . .does not begin with a "test" of the discrepancy between the standard and the actual state of affairs. Instead, it begins with a preliminary and fundamental operation, namely the construction of the standard itself, which, as a goal, is at the origin of the action and directs its further course.

Discrepancy reduction actually is a *consequence* of goal-directed behavior, not its cause. To live human beings must act to achieve goals. This requires that they first choose or set the goals and then work to attain them; there is a continuous cycle of discrepancy creation and reduction as a concomitant of this process.

Centering the theory around discrepancy reduction simply eliminates half the motivation sequence. It might be argued that there is nothing wrong with a theory which eliminates or fails to cover half (or more) of the motivation sequence, because, after all, no theory at this stage of our knowledge can be expected to cover everything. A control theorist might argue, for example, that, "I am going to take the goals as given and look only at what happens after the individual starts to work towards the goal." A control theorist *could* do this, but such a concession would eliminate control theory as a general model of human motivation. A general theory would have to acknowledge that people create as well as eliminate discrepancies.

Control theorists do acknowledge this at one level. They assert the goals that serve as standards when discrepancies are created are determined by higher-level or higher-order goals or standards which, in turn, are in the result of still higher level goals (Carver & Scheier, 1982; Powers, 1973). While it is true that people have goal hierarchies, this only pushes

the tension-reduction problem back a step further. If tension reduction is the ultimate ideal, why have any goal hierarchies at all?

Working from a neo-behaviorist framework, a control theorist might argue that the goals were forced on the person by outside influences (e.g., environmental determinism in the form of social "conditioning"), but with the collapse of behaviorism as the dominant paradigm in psychology (Bandura, 1986) such an argument seems less than adequate. The evidence of psychology does not support the view that people are passive victims of outside circumstances.

Another answer to the tension-reduction criticism might be that people are innately programmed with goal hierarchies in the form of "instincts" or the like which drive them toward pre-set ends. Such Freudian or neo-Freudian notions, however, are inconsistent with the enormous variety of human activities which are observed both within and across cultures. Chompsky's claims with respect to language structures notwithstanding, there is no evidence that people are born with any ideational *content.* Rather they are born, as Aristotle noted, *tabula rasa*; their ideas are acquired through experience and thought rather than through their genes.

Finally, it might be answered that people need goal hierarchies in order to live, i.e., to guide their choices and actions so as to satisfy their needs. As noted above, this assertion is true, but it contradicts the notion that tension reduction is a primary — unless one clings to the outdated notion that all needs operate like physical needs such as hunger. White (1959) has shown, however, that higher-order needs entail stimulation increases, i.e., pro-active goal seeking.

Let us now summarize the status of control theory in its original, mechanistic version As a mechanistic model control theory cannot explain the variety and complexity of human action because (1) human action is guided by consciousness not by blind mechanism, and (2) human action involves discrepancy creation not just discrepancy reduction. Rather than being an all-encompassing, higher-order model of human motivation, this version of control theory is actually an impoverished one. It misrepresents both the nature of motivation and the nature of human beings.

Control theorists recognized, almost from the beginning, that the mechanical model was inadequate to explain human action. A further problem was that there was no core of experimental findings which they could use as a base for modifying or developing the theory. Faced with these dilemmas control theorists took the only two possible routes short of abandoning the model: They filled the void either with (a) findings and propositions

Table I. Examples of Klein's (1989) Hypotheses Which Are Borrowed from Other Theories

Hypothesis No.	Hypothesis description	Borrowed from (reference)
1.	Difficult goals lead to higher levels of performance (than easy goals)	Goal-setting theory (Locke, 1968)
3.	Goals and feedback interact in influencing performance	Social-cognitive theory (Bandura, 1986; Bandura & Cervone, 1986) and goal setting theory (Locke, Shaw, Saari, & Latham, 1981)
10.	Whether or not feedback is noticed depends on importance of goal...	Satisfaction theory (Locke, 1976, if "noticed" means appraised as significant)
17.	People search for attributions to explain errors (failures)	Attribution theory (Weiner, 1986)
21.	The subjective expected utility of a goal affects goal choice	Exectancy theory (Vroom 1964)
32.	In a goal hierarchy, attention is at the level above an operating script	Script theory (Schank & Abelson, 1977)

from other theories and/or (b) propositions which were deduced rather than induced through empirical research.

The first procedure is best exemplified by Klein's (1989) recent paper in which he offers what he called a new, nonmechanical version of control theory. However, the content of this model is based overwhelmingly on findings from other theories. For example, in his Table I he lists 33 hypotheses (some of which have more than one part). By the present author's count, fifteen of the hypotheses or subhypotheses are drawn from goal theory, eight from expectancy theory, three from attribution theory, two from satisfaction theory, one from social-cognitive theory, and one (and possibly two) from script theory. Some of the hypotheses do not seem to derive from other theories, but are statements of the obvious (e.g., people have goal hierarchies). A sample of one of Klein's predictions based on each of the above theories is shown in Table I.

While one can agree with these hypotheses, because they all have been taken from data-based theories, one is compelled to ask: *Where, in all this, is control theory?* What unique perspective does control theory yield here? The hypotheses are simply listed rather than being organized around a central core or integrated into a coherent whole.

The problem of trying to show the unique contribution of control theory is revealed most clearly in Klein's attempt to show how the theory would explain the interrelationship of goal setting and feedback inhuman motivation. Klein (1989, p. 155) claims that "control theory provides an

elegant explanation for this interaction . . .: It is knowledge of one's pre-
vious performance relative to some goal that influences the amount of
effort subsequently expended." Klein goes on to claim that feedback may
motivate spontaneous goal setting and that goals may motivate feedback
seeking. Finally, he concludes that goals and feedback "are inseparable —
dual elements of a single motivational process."

First, observe the contradiction here. If goals and feedback are in-
separable, then they cannot interact since they cannot be separately ma-
nipulated. Second, Klein provides no actual explanation, elegant or
nonelegant, of the alleged interaction. Knowledge of one's previous per-
formance may influence effort but by what means or mechanisms? Funda-
mental to any such explanation is the distinction between cognition and
evaluation or appraisal (Locke, Cartledge, & Koeppel, 1968). Feedback
represents information and *qua (unevaluated) feedback* is affectively neutral
(e.g., you got 126 points on the exam). Only when there is a standard for
evaluating the feedback can it be appraised (e.g., a score of 126 represents
a B; you need an A in the course to keep your scholarship). A goal provides
a standard by which the person can judge if the feedback represents "good"
or "poor" performance. To explain the effects of feedback, it is necessary
to know what, if any, goals or standards the person uses to appraise it
(Locke & Latham, 1990). Further it is necessary to know what conclusions
the individual reaches as a result of the appraisal and what decisions he
or she makes as a result. Rather than providing an "elegant explanation"
of the goal-feedback relationship, control theory simply glosses over it.
Later we will see how goal theory and related theories explain the goal-
feedback interaction.

The more deductive approach is taken by Carver and Scheier (1990),
who attempt to explain positive and negative affect within the control the-
ory model. Like Klein, they expand the mechanical model in an attempt
to deal with conscious judgments and experiences such as expectancies
and feelings. They claim (quite incorrectly) that "it is remarkable how
rarely anyone ever asks where affect comes from" (Carver & Scheier, 1990,
p. 22).

They argue that people engage in two types of monitoring when they
are trying to reduce discrepancies. The first type compares the present state
(e.g., performance) with the standard (goal) but this comparison, they ar-
gue, is irrelevant to affect. The second type, which they call meta-
monitoring, checks on the *rate* at which the discrepancy is being reduced.
This rate is then compared with a reference value (some desired or stand-
ard rate). If the rate of discrepancy reduction is faster than the standard
rate, positive affect (satisfaction?) is experienced. If the rate of reduction
is slower than the standard rate, negative affect (dissatisfaction?) is

experienced; and if the rate is right on the standard, no affect is experienced (see their Table I, p. 23). These claims were not based on any data but were deduced from unspecified premises.

Actually there is an extensive literature on affect, both in general and within goal-setting contexts, which Carver and Scheier seem unaware of (e.g., Locke, 1976, 1984; Locke & Latham, 1990, Chap. 10). This literature does not reveal two separate types of standards, one of which is relevant to affect and one of which is not. The standard in all cases is the goal the person is aiming for. If only a single trial is involved or if there are multiple independent trials, then satisfaction is a direct (inverse) function of the degree and direction of the goal-performance discrepancy. If performance just meets the goal, the person is at least minimally satisfied. (The person does not experience zero affect as Carver and Scheier claim.) If performance exceeds the goal, the person is even more satisfied, and if it fails to meet the goal, the individual is dissatisfied (Locke & Latham, 1990).

The principle is the same if there is a long-term goal or end goal with multiple trials; the only added element is time. In this context the person will usually set subgoals for each trial and will also track progress toward the end goal. Satisfaction with performance on any given trial will be a joint function of (a) the performance–subgoal discrepancy, and (b) the perceived instrumentality of performance on that trial for attaining the end goal (Locke, Cartledge, & Knerr, 1970). Typically a low-performance–subgoal discrepancy will be viewed as more instrumental than a high- performance–subgoal discrepancy. Rate of progress toward the end goal is relevant to affect only insofar as it affects perceived instrumentality. A rapid rate of progress will normally (but not inevitably) be viewed as more instrumental in attaining the end goal than a slow rate of progress. This is because rate of progress (via instrumentality) can affect the *anticipation* of ultimate success, i.e., ultimate goal-performance discrepancy. Satisfaction is affected both by current performance (in relation to the subgoal) and anticipated performance (in relation to the end goal). Thus ultimately *rate of progress and goal-performance discrepancy are not two unrelated phenomena but two sides of the same coin*.[4]

[4]A paper by Saavedra and Early in this issue claims to have supported Carver and Scheier's theory that affect was based on rate of discrepancy reduction and not actual goal–performance discrepancy. However, it should be noted that (a) the goal–performance discrepancy information was based on false rather than accurate feedback and (b) rate of progress feedback (also fictional) was not actually rate of progress feedback at all but a prediction of whether they would reach their goal or not on the next trial, i.e., it was anticipatory discrepancy feedback for a future (independent) trial.

It might be asked whether a person could set himself or herself a goal not only with respect to attaining the end goal but also to the speed of attaining the end goal. The answer is yes. For example, a tennis player might have the goals to (a) win the match and (b) win it easily or rapidly. Then if he or she won the match with difficulty, the individual would have mixed emotions: happiness at having won and disappointment at not having played better. In this particular case, the second goal, winning easily, would probably be viewed as instrumental in doing well in later matches or winning the tournament. In other situations, however, people might have unrelated dual goals or even contradictory goals (e.g., to complete a complex task in record time and to make no errors). But the underlying principle remains the same: Affect is a function of actual or anticipated goal–performance discrepancy (Locke, 1976).

While Klein can be accused of borrowing too much from other theories, Carver and Scheier can be accused of borrowing too little. Ironically, the root of both problems is the same. Control theory has no empirical base and thus must depend either on other theories or the theorists' personal deductions for all content beyond the problematic mechanical core. But taking its content from other theorists robs it of originality; and taking its content from the theorists' deductions threatens its validity. The present writer has never understood the appeal of control theory, for the reasons noted above. Perhaps the machine metaphor gives it a "scientific" aura, but the aura, upon closer examination, seems largely illusory.

Given the problems which control theory has encountered, it is worth contrasting the development of control theory with that of goal-setting theory. Goal-setting theory was developed empirically over a 25-year period and is summarized in a book by Locke and Latham (1990). Its purpose has been to explain individual differences in task and work performance. Thus the domain of interest was quite similar to that of control theory. The development process, on the other hand, was entirely different.

GOAL-SETTING THEORY

The central core of goal-setting theory is the proposition, based on introspective evidence, that conscious goals regulate much human action and specifically performance on work tasks. This core has remained unchanged for over 25 years and was stimulated by the ideas of T. A. Ryan (whose book, *Intentional Behavior,* was published in 1970 but which was in draft form when the author was a doctoral student at Cornell). The core premise of goal theory was specifically formulated in relation to humans. The concept of goal and related concepts such as purpose were shown not

be to be able applicable to machines (Locke, 1969; see also Binswanger, 1990, summarized in Locke & Latham, 1990, Chap. 1).

Other than the core premise, there was no network of theoretical propositions that could formally be called goal theory until my 1990 book with Latham, although most components of the theory had appeared in earlier writings.

We deliberately avoided premature theorizing, because we did not know what we would find and because we could not anticipate all the different directions taken by the research done by ourselves and that done by others. Although each study had a specific purpose, there was no grand plan or design. Goal-setting research went in what retrospectively could be called five directions. These five directions were: (1) validation of the core; (2) demonstrations of generality; (3) identification of moderators (boundary conditions); (4) conceptual refinement and elaboration; and (5) integration with other theories. It should be noted that these categories are not independent; for example, conceptual elaboration was based in part on discoveries regarding moderators and integrations with other theories. Further, a given study could be relevant to more than one category. Let us consider each category in turn.

1. Validation of the Core. With two minor exceptions (noted in Locke & Latham, 1990) the first published goal-setting studies derived form Locke's 1964 doctoral dissertation (Locke, 1966). This was followed by several other studies (Locke, 1967a, 1967b; Locke & Bryan, 1966a, 1966b, 1967) and Locke's 1968 "Toward a theory . . ." paper which summarized the results of 12 early studies. The core finding was that the people trying for goals which were both specific and difficult performed better on tasks than people who had no goals, goals which were specific and easy, or goals which were vague (e.g., do your best).

2. Demonstrations of Generality. Although few studies were undertaken with the explicit purpose of showing the generality of goal-setting results, the cumulative effect of the studies was to show it. Locke and Latham (1990) report that generality has been demonstrated across: 88 different tasks; laboratory and field settings; many types of subjects (over 40,000 in all, including males, females, blacks, children, retardates, loggers, managers, professors) in eight different countries (Australia, Canada, the Caribbean, England, Israel, Japan, U.S., and W. Germany); multiple criteria (including quantity, quality, production, time, profit, costs, and job behavior); and time spans ranging from 1 min to 3 years. Further, the findings emerged at both the individual and group levels.

3. Identification of Moderators. We began studying the relationship of goal setting and *feedback* in 1966 (Locke & Bryan, 1966b). The relationship turned out to be more complicated than expected and was still being

clarified as Locke and Latham (1990) completed their book. Basically, the research shows that: (a) in relation to feedback effects, goals are a mediator in that they determine whether and the degree to which feedback will affect subsequent performance (Locke et al., 1968); (b) with respect to goals, feedback is a moderator in that goals do not effectively control action (in the long run) unless individuals have information concerning how they are progressing in relation to their goals (Erez, 1977); (c) as implied by (a) and (b), goals and feedback together are more effective than either one alone; feedback provides information (cognition); goals provide a standard for evaluating that information (motivation); (d) the effect of goal-relevant feedback on subsequent performance is a function of several factors: the degree of goal–performance discrepancy; the anticipated dissatisfaction with maintaining that discrepancy; the individual's degree of self-efficacy; and the level of the new goal the individual sets. Maximum performance improvement occurs when there is: some (vs. no) negative discrepancy; high anticipated dissatisfaction with maintaining this discrepancy; high self-efficacy; and a high goal is set for future performance (see Locke & Latham, 1990, Chap. 8, for a more detailed discussion). Social-cognitive theory, specifically the concept of self-efficacy (e.g., Bandura & Cervone, 1986) has played a significant role here; that theory will be discussed further below.

   Commitment is a second moderator of goal-setting effects. Again the findings revealed that the phenomenon was more complex than had originally been anticipated. For example, (a) legitimate authority turned out to be a powerful determinant of goal commitment contrary to what many social scientists expected; (b) in contrast and also contrary to ex-pectations, participation in setting the goal was found *not* to be more effective than assigning the goal, providing some rationale was given for the goal in the latter case (Latham, Erez, & Locke, 1988); (c) commit-ment was found to mean different things depending on the level of the assigned goals. If assigned goals are very low (easy), low commitment may lead to higher performance than high commitment since the low goals may be rejected in favor of higher ones. However, if assigned goals are very high, low commitment may lead to rejection of the high goals in favor of lower ones; (d) as implied in (c), commitment may function not only as a moderator (with the goal–performance relationship being highest under high commitment), but also as a main effect (under uni-formly high assigned goals, high commitment leads to better performance than low commitment).

   Goal-setting research has identified many different determinants of goal commitment (e.g., authority, peer influence, publicness, incentives and rewards, expectancy and self-efficacy, etc.) and has suggested (along with

Hollenbeck & Klein, 1987) that these determinants might be classified in terms of expectancy theory concepts (see Locke & Latham, 1990, Chaps. 6 and 7, for a detailed discussion).

    4. Conceptual Elaboration and Refinement. In addition to identifying moderators of the goal performance relationship, goal theory has identified the mechanisms by which goals affect performance. Three are relatively automatic mechanisms: effort, persistence, and direction. The difficulty of the goal regulates the degree of effort and (given no time limit or a long time limit) the degree of persistence shown. Goals also direct attention and action; the more specific the goal, the more explicitly action is directed, providing the individual has adequate ability (Locke, Chah, Harrison, & Lustgarten, 1989). Vague goals are compatible with many different actions or outcomes and so regulate action less precisely.

    Goal-setting theory proposes one additional mechanism, that of plans or task strategies. Locke and Latham (1990, p. 91) argue that goals direct action first by activating "stored knowledge and skills that the individual possesses that are perceived as relevant to the task." Wood and Locke proposed (Locke & Latham, 1990, Chap. 13, and Wood & Locke, 1990) that these skills be called stored task specific plans (STSPs). When the usual automatic mechanisms and stored skills do not work or are not anticipated to work, the individual is motivated to develop new task specific plans (NTSPs) in order to ensure goal attainment. NTSPs are especially needed on complex tasks (Wood, Mento, & Locke, 1987). These NTSPs could be discovered through conscious problem solving.

    Locke and Latham (1990) extrapolate from the findings of goal-setting studies using complex tasks (e.g., Earley, Connolly, & Ekegren, 1989) and argue that challenging goals are least likely to be beneficial when: (a) the task is complex and heuristic, so that the automatic goal mechanisms do not work; (b) subjects have no prior experience or training on the task and thus have no knowledge of suitable task strategies; and (c) there is pressure to perform well in a short time period, so that there is little freedom or time to experiment with different ways of performing the task. Isolating the separate effects of the above factors awaits further study.

    5. Integration with Other Theories. Goal setting has been integrated with other theories. However, these theories have served to clarify and expand on rather than to replace the goal theory core. We will focus here on two major theories: expectancy theory and social-cognitive theory and will mention satisfaction theory briefly.

    Expectancy theory. Integrating goal theory with expectancy theory (Vroon, 1964) has been a 25-year process, and it is not over yet. It was originally suggested that the two could be integrated by positing expectancy

theory variables (effort–performance expectancy, instrumentality, and valence) as determinants of goal choice and goal commitment. Once goals were chosen and committed to, then goals would take over as the most direct determinant of performance. This is, in fact, Klein's (1989, p. 166) position and was first suggested by Mento, Cartledge, and Locke in 1980. Unfortunately, this control theory and former goal theory view is incomplete. While it is true that expectancy theory concepts do predict goal choice and commitment, the integration does not stop there.

A major puzzle has involved the fact that expectancy theory predicts and finds a positive association between effort–performance expectancy and performance (holding valence and instrumentality constant), while goal theory predicts the opposite, in that hard goals which are rarely attained (and thus have low expectancies) lead to higher performance than easy goals which are routinely attained (and thus have high expectancies). Garland (1984) revealed how the theories could be fully reconciled. Between groups, expectancy is negatively related to performance due to an artifact: The expectancy referents are different for the different goal groups. But *within any given goal group*, where the expectancy referent is the same for all subjects, expectancy and performance are positively associated. Rather than working solely through goals, then, expectancies have an independent effect on performance. (For a detailed discussion, see Locke, Motowidlo, & Bobko, 1986.)

The integration of the instrumentality and valence concepts with goal theory has only recently been achieved. Instrumentality has been found to be *positively* associated with goal level (Matsui, Okada, & Mizuguchi, 1981; Mento, Locke, & Klein, 1990). However, valence, measured as anticipated satisfaction, has been found to be *negatively* associated with goal level (Locke & Latham, 1990; Mento, Locke, & Klein, 1990). The higher the goal, the *less* satisfaction one gets from any given level of performance. The explanation for this, as we shall see shortly, is provided by social-cognitive theory (Bandura, 1986) and satisfaction theory (Locke, 1976).

Social-cognitive theory. Social-cognitive theory (formerly called social learning theory) includes two key concepts which have implications for goal theory: role modeling and self-efficacy (Bandura, 1986). Role modeling has been found to affect both goal choice (Rakestraw & Weiss, 1981) and goal commitment (Earley & Kanfer, 1985). Self-efficacy is related in meaning to effort–performance expectancy but is broader in scope, referring to all factors that could lead one to believe that one will perform well on a task. Self-efficacy is task specific self-confidence and is measured by asking people to rate their confidence of attaining a number of different performance levels on a task. Since self-efficacy is measured in relation to performance

rather than in relation to goal level, there is no confounding caused by different frames of reference under different goal conditions (as with the goal–expectancy research). It has been found that self-efficacy is positively associated with performance both between and within goal groups. People assigned harder goals have higher self-efficacy than those assigned lower goals; further, they set harder personal goals when given a choice. Self-efficacy also affects goal commitment (Locke & Latham, 1990). Thus in addition to its direct effect on performance (which parallels that of expectancy; Locke et al., 1986), self-efficacy also has indirect effects through its influence on goal choice and commitment. The self-efficacy concept, therefore, plays multiple roles within goal-setting theory.

Bandura (1986) also identifies the reason why goal level is negatively related to valence. Goals serve simultaneously as guides to action and as standards for judging the adequacy of one's performance, that is, as standards for self-satisfaction. Thus it follows that higher goals demand that a person accomplish more before being satisfied with performance than lower goals; in short, the higher one's standards, the more difficult it is to succeed, that is, the more one has to do to be content with one's attainment. This means that performance valence (measured as anticipated satisfaction with various performance levels) is the other side of the goal coin, that is, *is part of what it means to have a goal.* In support of this interpretation, Mento, Locke, and Klein (1990) found that summated valence (anticipated satisfaction across a range of performance levels) is nearly as good a predictor of performance as a direct report of the individual's personal goal. (The two measures, however, do not appear to be totally interchangeable.)

This triple integration of goal theory, expectancy theory, and social-cognitive theory expands and enriches our understanding of goal setting by showing just what it *means* to have a goal. The observation that a goal is a standard for self-satisfaction also allows goal theory to be integrated with *satisfaction theory* (Locke, 1976). Satisfaction involves the appraisal of a person, object, or situation against a standard of value. In the performance realm, the value standard is one's goal; thus it follows that a major determinant of performance satisfaction is one's degree of success in attaining one's goal (Locke & Latham, 1990, Chap. 10).

CONCLUSIONS

While data-based theories such as goal theory, expectancy theory, social-cognitive theory, satisfaction theory, and others have made genuine contributions to our knowledge of human motivation, there is little
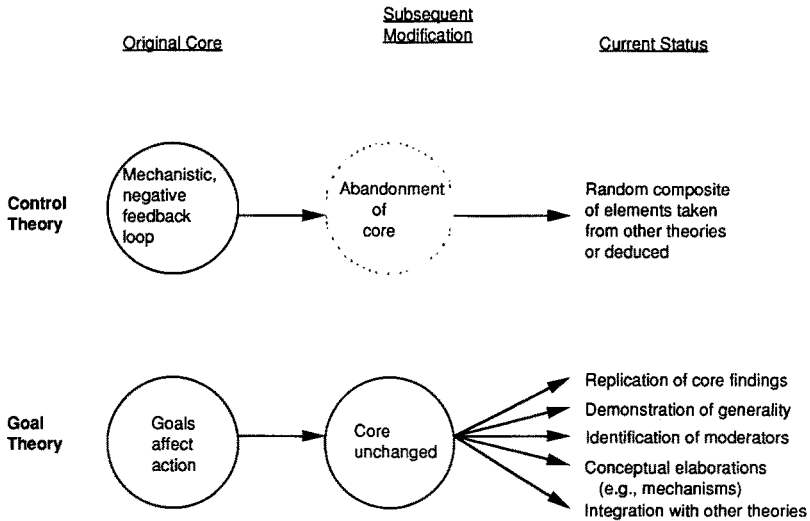
Fig. 2. Development of control theory and goal theory.

evidence that control theory has made any such contribution. Its original core is not a viable model and attempts to enlarge the core have simply added propositions form other theories or deduced propositions which are not consistent with empirical data. The contrasting patterns in the development of control theory and goal theory are shown in Fig. 2.

Control theorists, however, claim that there are instances in which they have made genuinely original contributions to motivation theory. First, they have claimed originality for the concept of goal hierarchy. Although such a concept may be useful, it is really only an extension of the goal-setting concept to include more than one level of goal. Such a minor development does not justify endowing control theory with the status of a new theory, and certainly not an all-encompassing model.

Second, it has been argued that control theory is unique, because it deals with the issue of goal change (e.g., Campion & Lord, 1982). However, goal change was actually the focus of level of aspiration theory which originated in the 1930s; thus is it clearly not original to control theory. Further, goal change is simply an extension of static goal theory. For example, if commitment is affected by expectancy and valence, then it follows that if these inputs change, so will the goal. Dealing with change does not give control theory the status of a novelty.

Third, control theorists claim that their concept of "self-focus" is unique (Carver & Scheier, 1981). In a recent article centered on this

individual difference variable, Hollenbeck (1989, p. 415) describes a person high in self-focus as "self-absorbed, narcissistic, or self-obsessed." He also acknowledges that in his study of satisfaction, commitment, and turnover, *"The main contribution made by control theory . . . is the recognition of individual differences in self-focus"* (Hollenbeck, 1989, p. 413). He correctly notes that the correlations between feedback–standard discrepancy and satisfaction obtained in his study can be explained by other theories (e.g., satisfaction theory, Locke, 1976). Hollenbeck (1989) found no main effect for self-focus on satisfaction after controlling for discrepancy. He did find a main effect on commitment, but he did not control for satisfaction, a strong correlate of commitment (Locke & Latham, 1990). He also found main effects on organizational and job turnover, but without controlling for (or in one case measuring) satisfaction, commitment, or intent to leave, all three of which are well-established predictors of turnover (especially the latter). He also found several two-way interactions between perceived future discrepancy and self-focus when predicting satisfaction and commitment. However, the graphic plots look very much like the discrepancy–*importance* interactions first reported by Mobley and Locke (1970; see also Locke, 1976; Locke & Latham, 1990). Thus it may be that self-focus is a proxy for job outcome or facet importance. None of the three-way interactions implied by previous studies of self-focus came out. In a previously published study, Hollenbeck and Williams (1987) had found self-focus to have a significant performance effect but only as part of a three-way interaction in which ability (past performance) was not controlled.

Thus far, then, there is little evidence to show that self-focus has the power to explain significant variance in affect or performance which is not accounted for by existing theories. And if such results were forthcoming, it would mean only that self-focus was an *adjunct* to these other theories, rather than a superordinate explanation of them. Conceivably a whole theory of some kind might be built around the trait of self-focus, as McClelland did with need for achievement, but such a theory would properly be called self-focus theory rather than control theory.[5]

Goal theory has established its case based on 25 years of research involving some 500 studies using 40,000 subjects in eight countries using 88 different tasks with varied settings and measures. It is data-based, conceptually well-developed, and integrated with other theories where those theories have some insights to offer.

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[5]It should be noted that there is a considerable literature in social psychology on self-consciousness and behavior–attitude consistency, much of it growing out of cognitive dissonance theory (e.g., see Baron & Byrne, 1991, for a partial summary). However, this literature is only peripherally related to the issue of explaining task performance.

Over 20 years ago Glaser and Strauss (1967) urged sociologists to build "grounded" theory, that is, theories based on integrations of data collected explicitly to understand some phenomenon. They contrasted this approach with the more traditional logico-deductive approach which develops a formal theory at the outset and then tries to find empirical data to support it. The latter procedure, they argue, rigidifies thinking along preconceived lines and leads to a poor fit between predetermined categories and data which do not clearly correspond to those categories.

Whereas goal theory is clearly a grounded theory, control theory is not a pure logico-deductive theory but rather a puzzling hybrid. It began as a logico-deductive theory based on machine cybernetics; when this core model turned out to be inadequate, data-based propositions from other theories and more deduced propositions were added on piecemeal. The result appears to be more of a kaleidoscope than an integrated theory. Thus far there is little evidence that the control theory approach to theory building will prove to be a fruitful one.

Very few valid and useful theories have been developed thus far in management, organizational behavior, industrial–organizational psychology, and related fields. According to Miner (1984) goal theory is one of the exceptions. It is a reasonable hypothesis to suggest that its success was due to the process by which it was developed, i.e., the grounded theory approach.

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