

## From Thought to Action: Mechanisms of Personal Agency\*

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The present article examines how thought affects motivation and action through the exercise of personal agency. The issues addressed concern the exercise of control over one's functioning founded on self-percepts of efficacy; the self-regulation of motivation by self-reactive influences arising from cognitive comparison processes; and the conception-matching process by which competencies are developed through psychological modeling. Thought operates within a larger causal matrix of interacting determinants involving behavioral and environmental factors as well.

Psychological theorists and researchers tend to focus their efforts on explaining either human thought or human action. These separate pursuits are further insulated by mutual disinterest, if not outright antagonism, between cognitivists and actionists. As a result, the mechanisms governing the inter-relationship between thought and action have been largely neglected.

Thought affects action through the exercise of personal agency. People use the instrument of thought to comprehend the environment, to alter their motivation, and to structure and regulate their actions. The experiences flowing from their actions, in turn, affect the nature of their thought. Within this model of reciprocal causation, people are neither autonomous agents, nor automatically shaped and controlled by environmental forces. Rather, people make causal contribution to their own motivation and behavior within a

matrix of interacting influences (Bandura, 1986).

### Perceived Efficacy and Self-Reflective Capability

The human capability for reflective self-consciousness provides a prominent mechanism of human agency. By reflecting on their experiences and on what they know, people can derive knowledge about themselves and the world around them. They also evaluate and alter their own thinking by reflective thought. In verifying thought by this means people generate ideas, act on them or predict from them what should happen, judge from the evident results the adequacy of their thoughts, and change them accordingly.

### *Self-Efficacy Mechanism*

Among the types of thoughts that affect human motivation and action, none is more central or pervasive than those concerning personal efficacy. Perceived self-efficacy refers to beliefs in one's capabilities to execute the competences needed to exercise control over events that affect one's welfare. The self-efficacy mechanism plays a central role in human agency. People's beliefs in their capabilities affect what courses of action they choose to pursue, how much effort they will mobilize in a given endeavor, how long they

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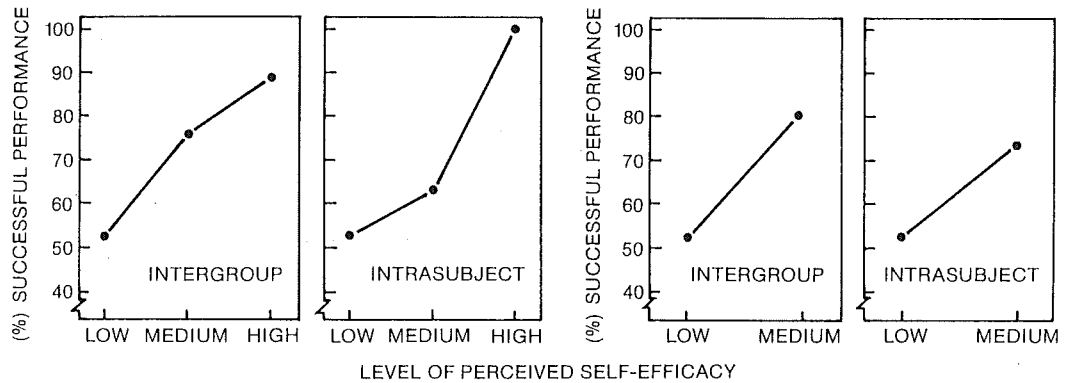


Figure 1. Mean performance attainments as a function of differential levels of perceived self-efficacy. The two left panels present the relationship for perceived self-efficacy raised by master experiences; the two right panels present the performance attainments for perceived self-efficacy raised by vicarious experiences. The intergroup panels show the performance relationships of groups of subjects for the same subjects after their self-perceptions of efficacy were successively raised to different levels (Bandura, Reese, & Adams, 1982).

will persevere in the face of obstacles and failure experiences, whether their thought patterns take self-hindering or self-aiding form, and how much stress they experience in coping with environmental demands.

#### Causal Analysis

A central question centers on the issue of causality. Do people's efficacy beliefs operate as causal factors in human motivation and behavior? This issue has been investigated by different paradigms designed to test all the postulated links in the causal process. In one approach, perceived self-efficacy is raised in phobics from virtually non-existent levels to preselected low, moderate, or high levels by providing them with mastery experiences, or simply by modeling coping strategies for them (Bandura, Reese, & Adams, 1982). Then their coping behavior is measured.

As may be seen in Figure 1, higher levels of perceived self-efficacy produce higher performance attainments. The efficacy-action relationship is replicated across different phobic dysfunctions and in both intergroup and intrasubject comparisons, regardless of whether perceived self-efficacy was raised by mastery experiences or by vicarious influence. Microanalysis of efficacy-action congruences reveal a close fit between performance and perceived self-efficacy on individual tasks.

Another approach to the test of causality is to control, by selection, level of ability but to vary perceived self-efficacy at each ability

level. Collins (1982) used this approach. She selected children who judged themselves to be of high or low mathematical efficacy at each of three levels of mathematical ability. They were then given difficult problems to solve. Within each level of mathematical ability, children who regarded themselves as efficacious were quicker to discard faulty strategies, solved more problems, chose to rework more of those they failed, and did so more accurately. Positive attitudes toward mathematics were better predicted by perceived self-efficacy than by actual ability. Perceived self-efficacy also predicted attributional styles. High self-efficacy students attributed failure to lack of effort, whereas low self-efficacy students attributed failure to deficient ability. As this study shows, people who perform poorly may do so because they lack the skills, or they have the skills but they lack the self-efficacy to use them effectively.

A third approach to causality is to introduce a third approach devoid of causality to introduce affect competency, but that can alter perceived self-efficacy. One then measures how the altered perceived efficacy affects level of motivation. Studies of anchoring influences show that arbitrary reference points from which judgments are adjusted either upward or downward can bias the judgments because the adjustments are usually insufficient. Cervone and Peake (1986) used arbitrary anchor values to influence efficacy judgments. Judgments made from an arbitrary high anchor biased

students' perceived self-efficacy as a problem solver in the positive direction. An arbitrary low anchor lowered students' judgments of their efficacy (Figure 3). The higher the instated perceived self-efficacy, the longer they persevered on difficult and unsolvable problems before they quit. Mediational analyses reveal that the anchoring influence has no effect on motivation when perceived self-efficacy is partialled out.

A number of studies have been conducted in which perceived self-efficacy is altered by bogus feedback unrelated to one's actual performance. Using this type of efficacy induction procedure, Weinberg, Gould, and Jackson (1979) showed that physical stamina in competitive situations is mediated by perceived self-efficacy. They raised the perceived self-efficacy of one group by telling them that they had triumphed in a competition of muscular endurance. They lowered the perceived self-efficacy of another group by telling them that they were outperformed by their competitor. The lower the illusory beliefs of physical stamina, the less strength subjects displayed during competition on a new task of physical strength (Figure 4). Failure in the subsequent competition spurred the high self-efficacious ones to greater effort, whereas failure further deteriorated the performance of those whose perceived self-efficacy had been undermined.

Still another approach to the verification of causality employs a contravening design in which a procedure that ordinarily impairs functioning is applied, but in ways that raise perceived self-efficacy. The changes accom-

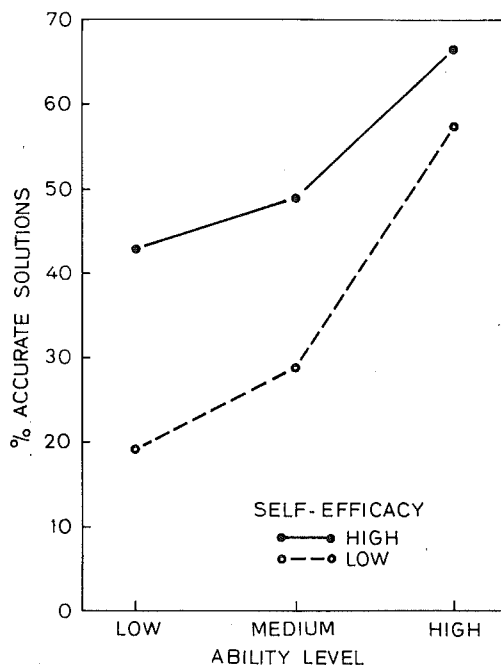


Figure 2. Mean levels of mathematical solutions achieved by children as a function of mathematical ability and perceived mathematical self-efficacy. Plotted from data of Collins, 1982.

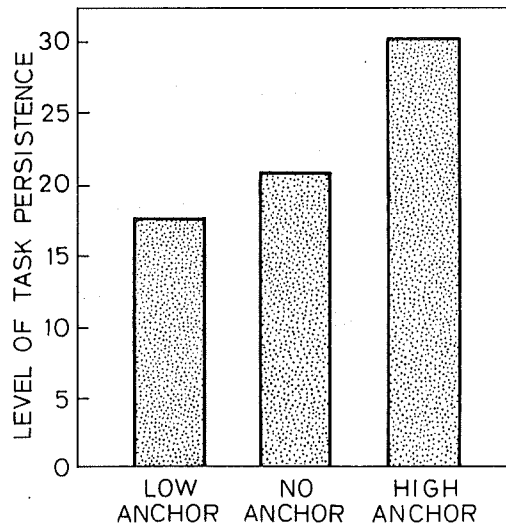
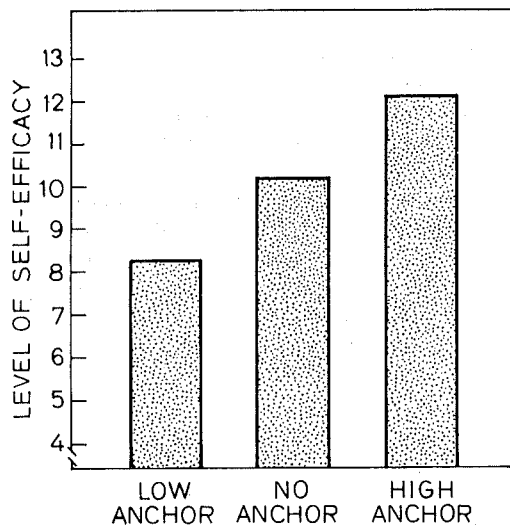


Figure 3. Changes induced in perceived self-efficacy by anchoring influences and the corresponding effects on subsequent task persistence (Cervone & Peake, 1986).

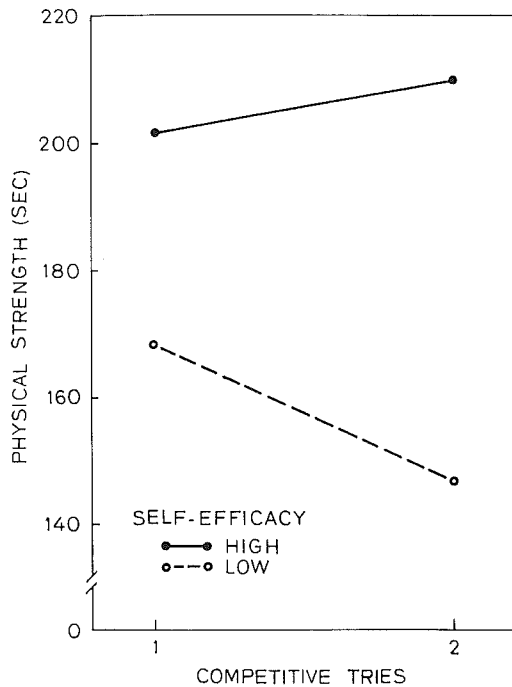


Figure 4. Level of physical stamina in competitive situations as a function of illusorily instated self-percepts of physical efficacy (Weinberg, Gould, & Jackson, 1979).

panying psychological procedures may result as much, if not more, from instilling beliefs of personal efficacy as from the particular skills imparted. If people's beliefs in their coping efficacy are strengthened, they approach situations more assuredly and make better use of the skills they have. Procedures that could exacerbate a problem may produce beneficial results when presented in ways that enhance perceived self-efficacy.

In a study conducted by Holroyd and his associates (Holroyd, et al., 1984), persons suffering from tension headaches were told that headaches would abate by relaxing facial muscles. In biofeedback sessions, they trained one group to become good relaxers. Unbeknownst to another group, they were trained to become good tensers of facial muscles, which, if anything, would aggravate headaches. Regardless of whether people were tensing or relaxing, arbitrary feedback of success that they could exercise control over muscular tension instilled a strong sense of efficacy that they could prevent the occurrence of headaches in different stressful situations. The higher their perceived self-efficacy, the

fewer headaches they experienced. The actual amount of change in muscle activity achieved in treatment was unrelated to the incidence of subsequent headaches.

These diverse causal tests conducted with different modes of efficacy influence, populations, and domains of functioning provide convergent evidence that perceived self-efficacy contributes significantly to level of motivation and performance accomplishments.

#### *Perceived Self-Efficacy and Affect*

The efficacy mechanism governs affect as well as motivation and action. Perceived self-efficacy to exercise control over unfamiliar or threatening events plays an important role in human stress and anxiety. Threat does not reside as a fixed property in situational events. Rather it involves an interactional relation between perceived coping capabilities and potentially hurtful aspects of the environment. People who believe they can exercise control over potential threats have little reason to be perturbed by them. But those who believe they cannot manage threatening situations safely, have much cause for anxiety. They tend to dwell on their vulnerabilities. They see the environment as fraught with danger, and worry about potential calamities that rarely, if ever, happen. In so doing, they distress themselves and impair their psychosocial functioning. Perceived controlling efficacy is thus a key factor in determining whether life stressors are perturbing or not.

The recent years have produced a substantial body of research documenting the influential role of personal control in anxiety and stress reactions (Lazarus & Folkman, 1984; Miller, 1979). In social cognitive theory, perceived self-efficacy operates as a cognitive mechanism by which controllability reduces stress reactions. It is mainly perceived inefficacy to cope with potentially aversive events that makes them anxiety provoking.

Social cognitive theory posits an interactive, though asymmetric, relation between perceived self-efficacy and anxiety arousal, with coping efficacy exercising the greater sway. Perceived self-inefficacy leads people to approach intimidating situations anxiously, and experience of disruptive arousal may further lower their sense of efficacy that they will be able to cope well. However, people

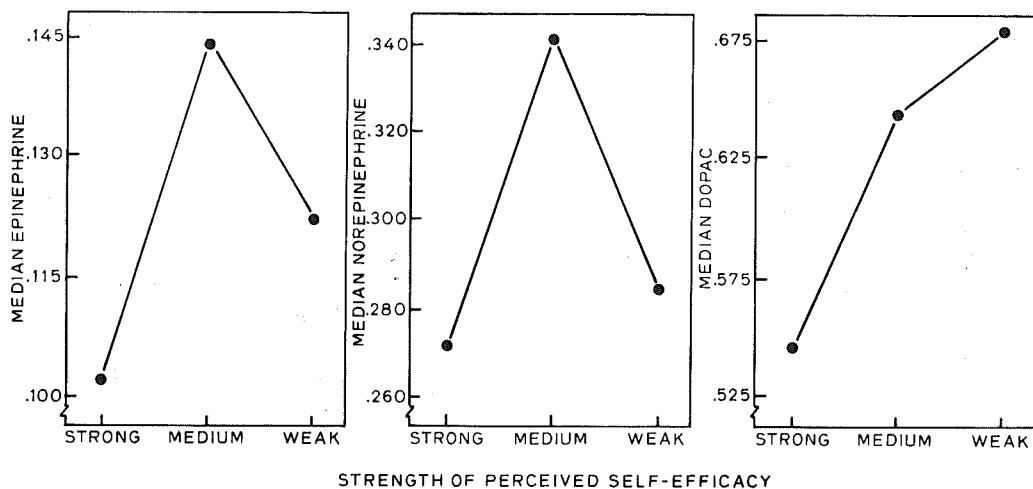


Figure 5. Median level of catecholamine secretion as a function of perceived coping self-efficacy (Bandura, Taylor, Williams, Mefford, & Barchas, 1985).

are much more likely to act on self-percepts of efficacy inferred from mastery experiences and social comparison than rely heavily on the indefinite stirrings of their viscera.

In efforts to verify the link between perceived coping efficacy and psychophysiological stress, we have conducted microanalytic studies at the level of subjective distress, autonomic arousal, and neuroendocrine reactivity. In these studies, coping tasks are selected that phobics judge to be in their low, medium, or high efficacy range. Their subjective stress and physiological arousal are measured as they try to perform these tasks (Bandura, 1982; Bandura, Reese, & Adams, 1982). Phobics display little anxiety arousal on tasks for which they judge themselves fully efficacious, but as they cope with tasks for which they distrust their coping efficacy their anxiety mounts, their heart rate accelerates, and their blood pressure rises.

This research was carried one step further by examining how people's beliefs about their coping efficacy affect release of catecholamines, which govern autonomic stress reactions (Bandura, Taylor, Williams, Mefford & Barchas, 1985). The phobics were asked to perform tasks corresponding to different strengths of perceived self-efficacy. Figure 5 presents the microrelation between self-efficacy belief and plasma catecholamine secretion.

Epinephrine and norepinephrine levels were

low when phobics coped with tasks in their strong efficacy range. Self-doubts in perceived coping efficacy produced substantial increases in these catecholamines. When presented with tasks that exceeded their perceived coping capabilities they promptly rejected them. Both catecholamines dropped sharply. Dopac seems to be triggered by the mere apperception that environmental demands overwhelm one's perceived coping capabilities, even though the phobics have no intention of engaging in the activity.

In the next phase of the study, changes in catecholamine secretion were measured as phobics conquered their phobia through guided mastery treatment. The plasma catecholamine levels at 5 demarcated stages in treatment are depicted in Figure 6.

During the initial phases of treatment, when phobics lacked a sense of coping efficacy, even the mere sight or minimal contact with the phobic object activated catecholamine responses. After the participants gained controlling efficacy, all three catecholamines dropped. When they were asked to relinquish all control, which left them completely vulnerable, catecholamine reactivity promptly rose. This pattern of results is in accord with a mechanism involving controllability rather than simple extinction or adaptation over time.

In this series of experiments, after efficacy beliefs were strengthened to the maximal level

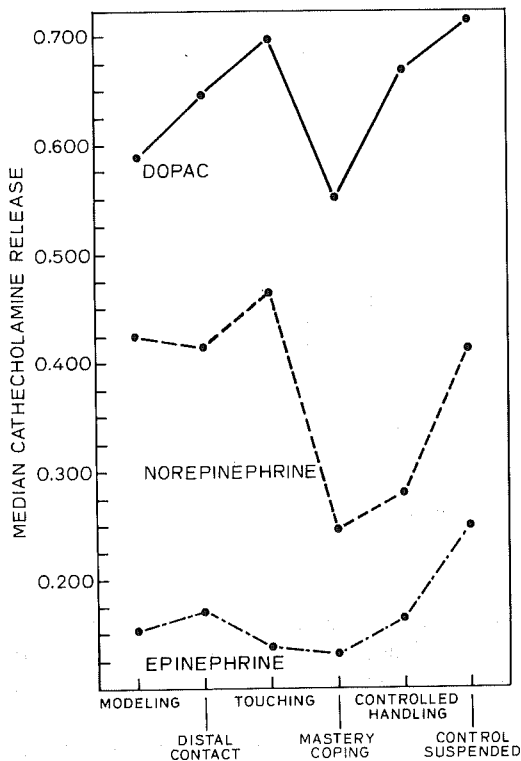


Figure 6. Changes in median level of catecholamine secretion as phobics master effective coping techniques (Bandura, Taylor, Williams, Mefford & Barchas, 1985).

by guided mastery treatment, the previously intimidating tasks are performed without any differential subjective distress, autonomic arousal, or catecholamine reactivity. Thus, perceived coping efficacy rather than the tasks, per se, is the source of variance in affective reactivity.

#### *Perceived Self-Efficacy and Depression*

Inability to influence events and social conditions that significantly affect one's life can give rise to feelings of futility and despondency, as well as to anxiety. The nature of the outcomes over which personal control is sought largely determines whether perceived self-inefficacy will arouse anxiety or depression. People experience anxiety when they perceive themselves ill-equipped to manage potentially aversive situations. People are saddened and depressed by perceived inefficacy to control highly valued outcomes. When inability to gain positive outcomes ushers in future aversive ones, as when failure to secure

a job jeopardizes one's livelihood, perceived self-inefficacy is both distressing and depressing.

Yates and his associates (Bloom, Yates, & Brosvic, 1983; Davies & Yates, 1982) have found that people are most vulnerable to depression and performance debilitation when they perceive themselves as inefficacious but see similar others succeed. They do not become depressed if they perceive neither themselves nor others as capable of exercising control.

The satisfactions people derive from what they do are determined largely by the standards against which they measure their accomplishments. A sure way of inducing self-discouragement and a sense of personal inadequacy is to judge one's attainments against lofty distal goals. This is not to say that high aspirations necessarily diminish self-esteem. High aspirations are self-motivating, rather than self-discouraging, provided that one's current accomplishments are measured against attainable subgoals through which aspirations are eventually realized.

People who are prone to depression tend to set high standards for themselves relative to their attainments and to belittle their accomplishments. Whether the goals people set for themselves are realistic or not depends on whether they have the capabilities to match them. Perceived self-efficacy is one factor that will determine whether failures are motivating or depressing. Failure will be motivating for people who have a high sense of efficacy for goal attainment; failure will be depressing for those who invest their self-regard in personal accomplishments they judge themselves inefficacious to fulfill; and failure will beget apathy in people who judge themselves inefficacious and forsake difficult goals. In comparative studies, the goals nondepressed people pursue fall within reach of their perceived self-efficacy, whereas the depressed set their personal standards of accomplishment well above their perceived efficacy (Kanfer & Zeiss, 1983).

Mood and perceived self-efficacy influence each other bidirectionally, as indicated by the research of Kavanagh and Bower (1985). Induced positive mood enhances perceived self-efficacy; despondent mood diminishes it. People then act in accordance with their mood altered efficacy beliefs, choosing more

challenging tasks in an efficacious than in an inefficacious frame of mind (Kavanagh, 1983). Despondency can thus lower self-efficacy beliefs which spawns poor performance, breeding even deeper despondency. In contrast, by raising perceived self-efficacy that facilitates accomplishments, good mood can set in motion an affirmative reciprocal process.

### *Perceived Self-Efficacy and the Control of Pain*

The anguish of pain is another affective domain in which the efficacy mechanism is implicated. Stimulation of pain receptors will give rise to different amounts of subjective pain, depending on how much one attends to it, and what one does to lessen it. There are several ways in which perceived coping efficacy can bring relief from pain. People who believe they can alleviate their suffering are likely to use whatever ameliorative skills they have learned to do so. If pain mounts, those who doubt their controlling efficacy give up quickly, whereas those who believe they can exercise some control over their pain will persevere in their efforts. A sense of coping efficacy also reduces distress and tension, which only exacerbate sensory pain and discomfort. Consciousness has a very limited capacity. It is difficult to keep more than one thing in mind at a time. If pain sensations are supplanted in consciousness, they are felt less. Dwelling on pain sensations only makes

them more noticeable and, thus, more difficult to bear. Perceived efficacy can lessen pain by diverting attention from pain sensations to engrossing activities.

Reese (1983) found that training in cognitive coping techniques, self-relaxation, or administration of placebos all raised people's efficacy beliefs that they could exercise some control over cold pressor pain. Regardless of the mode of treatment they received, the stronger their belief that they could manage pain the less painful they experienced the pain stimulation, the longer they took before they first noticed the pain, and the longer they tolerated it.

Perceived self-efficacy also predicts how well people use psychological techniques they have been taught to control acute and chronic clinical pain. O'Leary (1985) taught patients who suffered from rheumatoid arthritis how to use cognitive strategies to control pain, proximal goal setting to increase their activity level, and self-incentives to motivate their efforts. Treatment increased patients' perceived self-efficacy to manage pain and to pursue potentially painful activities. These changes were reflected in better functioning. The patients experienced less pain while pursuing their activities and reduced inflammation in their joints (Figure 7).

The more they increased their perceived coping efficacy the less pain they experienced, the less they were disabled by their arthritis, and the greater reduction they achieved in joint impairment. The more efficacious were

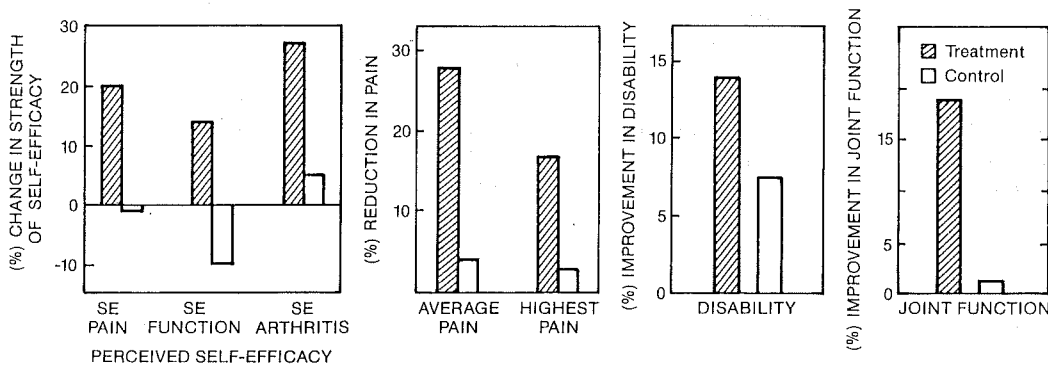


Figure 7. Effect of cognitive coping strategies on perceived coping efficacy and reductions in pain, arthritic debility, and joint impairment. The cognitive treatment included cognitive strategies to control pain, proximal goal setting, and self-incentives. Patients in the control condition received an arthritis helpbook describing self-management techniques for coping with different aspects of arthritis and were encouraged to increase their activity level (O'Leary, 1985).

also less depressed and less distressed. Although treatment did not alter immunologic function, perceived coping efficacy was associated with increased suppressor T-cells, and a decrease in the ratio of helper to suppressor T-cells. For an autoimmune disorder like arthritis, in which the suppressor T-cell function is depressed, such changes suggest improvement in the immune system.

This general line of research has been extended to clarify the mechanisms by which perceived self-efficacy exercised through cognitive control increases pain tolerance (Bandura, O'Leary, Taylor, Gauthier, & Grossard, 1985). Pain sensations can be blocked at the level of physiological transmission through endorphin release, or by cognitive and attentional mechanisms that reduce consciousness of pain sensations. Stress activates endogenous opioids that block pain transmission (Bolles & Fanselow, 1982). It is not the physically painful stimulation, per se, but the psychological stress over its uncontrollability that is the critical factor in opioid activation (Hyson, Ashcroft, Drugan, Grau, & Maier, 1982).

Because a high sense of coping efficacy makes aversive situations less stressful, it may reduce stress-activated opioids. However, exercise of perceived self-efficacy that increases pursuit of pain-producing activities heightens the level of pain stimulation. Thus, for example, a strong sense of efficacy that promotes vigorous activity by arthritic patients or lengthens endurance of cold pressor pain brings mounting pain stimulation. Indeed, in the latter situation, the exercise of self-efficacy eventually heightens pain stimulation to the point where it begins to overwhelm one's coping capabilities. The stress of failing control with mounting pain in later stages of coping would activate opioid systems. To test this notion, people who had been taught cognitive strategies for reducing cold pressor pain were administered either a saline solution or naloxone, an opiate antagonist that impedes endorphins from blocking the transmission of pain impulses. The resultant changes in pain tolerance indicate that the exercise of cognitive control over pain activates opioid involvement. The stronger people's perceived efficacy that they can reduce pain, the greater the opioid activation.

### *Exercise of Control Through Self-Efficacy Belief*

The findings of different lines of research show that people who have a high sense of perceived efficacy think, feel, and behave differently from those who perceive themselves as inefficacious. People who distrust their capabilities shy away from difficult tasks. They have low aspirations, and weak commitment to the goals they choose to pursue. In taxing situations they dwell on their personal deficiencies, the formidableness of the task, and adverse consequents. Such vexatious thinking further undermines their efforts by diverting attention from how best to perform an activity to concerns over personal deficiencies and possible calamities. They reduce their efforts, and give up quickly in the face of difficulties. They are also slow to recover their sense of efficacy following failure or setbacks. Because they are prone to diagnose insufficient performance as deficient aptitude, it does not require all that much failure for them to lose faith in their capabilities. They fall easy victim to stress and depression.

In contrast, a strong resilient sense of efficacy enhances psychosocial functioning in many ways. People who have high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an affirmative orientation fosters interest and engrossing involvement in activities. They set themselves challenging goals and maintain strong commitment to them. They heighten their efforts in the face of failures or setbacks. They quickly recover their sense of efficacy after setbacks. Success usually comes through renewed effort following failed attempts. Therefore, it is resiliency of perceived self-efficacy that counts. White (1982) documents how people who eventually achieved prominence in various fields were sustained by an invincible sense of self-efficacy that enabled them to override innumerable rejections of their work. A robust sense of personal efficacy provides the needed staying power. People who believe strongly in their capabilities attribute failure to insufficient effort, which supports a success orientation. They approach threatening situations with assurance that they can exercise control over them. As a



result, they experience low stress. Such an efficacious outlook produces performance accomplishments, reduces stress, and lowers vulnerability to depression.

#### *Benefits of Propitious Self-Efficacy Belief*

It is widely believed that misjudgment breeds dysfunction. Certainly, gross miscalculation can be costly to one's psyche, body, and pocketbook. But overoptimistic self-appraisals that do not stray unduly from what is possible can be beneficial, whereas veridical judgments can be self-limiting.

Human skill is a variable, rather than a fixed, property. What people can do depends on how well they orchestrate the subskills they possess and how hard they work at the task. The same capability can, therefore, give rise to performances that are subpar, ordinary, or extraordinary for a particular person. When people err in their self-appraisal they tend to overestimate their capabilities. This is a benefit rather than a cognitive failing to be eradicated. If efficacy beliefs always reflected only what people can do routinely, they would rarely fail, but they would not mount the effort needed to surpass their ordinary performances.

There is a growing body of evidence that human attainments and positive well-being require an optimistic sense of personal efficacy. Social realities are fraught with difficult conditions. They are full of impediments, adversities, setbacks, frustrations, and inequities. People must, therefore, have a robust sense of personal efficacy to sustain the perseverant effort needed to succeed. Realists are easily dissuaded or become cynics.

Evidence suggests that it is often the so-called normals who are distorters. Anxious and depressed people have been compared in their skills and their self-beliefs with those who are unburdened by such problems. The findings show that the groups differ little in their actual skills. But they differ substantially in their beliefs about their efficacy. People who are socially anxious are often just as socially skilled as the more sociable ones. But socially active people judge themselves much more adept (Glasgow & Arkowitz, 1975).

Depressed persons usually display realistic self-appraisals of their social competencies. The nondepressed view themselves as much more adroit than they really are. As depressed

people improve in treatment, they show the self-enhancing biases that characterize the nondepressed (Lewinsohn, Mischel, Chaplin, & Barton, 1980). A similar pattern is revealed in laboratory tasks in which people perform actions and outcomes occur, but the actions exert no control over the outcomes. The depressed are quite realistic in judging they lack control. In contrast, nondepressed people believe they are exercising some control in such situations (Alloy & Abramson, 1979). After nondepressed people are made temporarily depressed they become realistic in judging their personal control. When depressed people are made to feel happy they overestimate the extent to which they exercise control (Alloy, Abramson, & Viscusi, 1981). Thus, the depressed appear as realists, the nondepressed as confident illusionists.

Social reformers believe that collective effort will bring social change. Although their beliefs usually go unrealized, they sustain reform efforts that achieve lesser, but important, gains. Were social reformers to be entirely realistic about the prospects of success, they would either forego the endeavor, or fall easy victim to discouragement. Realists may adapt well to existing realities, but those with a self-efficacious view are likely to change those realities.

The emerging evidence indicates that the successful, the sociable, the nonanxious, the nondespondent, and the social reformers take an optimistic view of their personal efficacy to exercise influence over events that affect their lives. If not unrealistically exaggerated, such self-beliefs foster accomplishments.

#### Self-Regulatory Goal Mechanisms

Personal agency also figures prominently in cognitively-based motivation. Social cognitive theory (Bandura, 1986) distinguishes between two broad classes of motivation: those which are biologically based and those which are cognitively based. The biological motivators include physiological conditions arising from cellular deficits and external aversive stimuli. In cognitive motivation, people motivate themselves and guide their actions anticipatorily through the exercise of forethought. They anticipate likely outcomes of prospective actions, they set goals

for themselves, and plan courses of action that lead to valued futures.

The capability for purposive action is rooted in cognitive activity. Future events cannot be causes of current behavior. However, by cognitive representation in the present, conceived future events are converted into current motivators and regulators of behavior. The translation of forethought into effective action concerns another important aspect of human agency.

One common source of cognitive motivation operates through anticipated response outcomes. Many of the things that people do are designed to gain anticipated benefits and to avert future trouble. Radical behaviorists reinterpreted motivation as automatic reinforcement. Social cognitivists construe reinforcement as incentive motivation, in which outcomes affect behavior largely through the mediation of forethought. A second important source of cognitive motivation operates through internal standards and self-evaluative reactions to one's own performances. A large body of evidence shows that goals, or personal standards, function as powerful cognitive motivators (Locke, Shaw, Saari, & Latham, 1981).

#### *Contribution of Self-Influences to Cognitive Motivation*

Motivating self-influences are activated by a cognitive comparison process. This requires two comparative factors — an explicit standard and information as to how one is doing. Neither knowledge of one's attainment without goals, nor goals without knowing how one is doing provides the basis for motivating self-reactions (Bandura & Cervone, 1983). This is shown in Figure 8, which summarizes the findings of a study that measured level of self-motivation when both, only one, or none of the comparative factors was present.

Cognitive motivation is mediated by three types of self-influences — affective self-evaluation, perceived self-efficacy, and personal goal setting. By making self-satisfaction conditional on matching selected goals, people give direction to their actions and create self-incentives to persist in their efforts until their performances match their goals. Whether negative discrepancies are motivating or discouraging is partly deter-

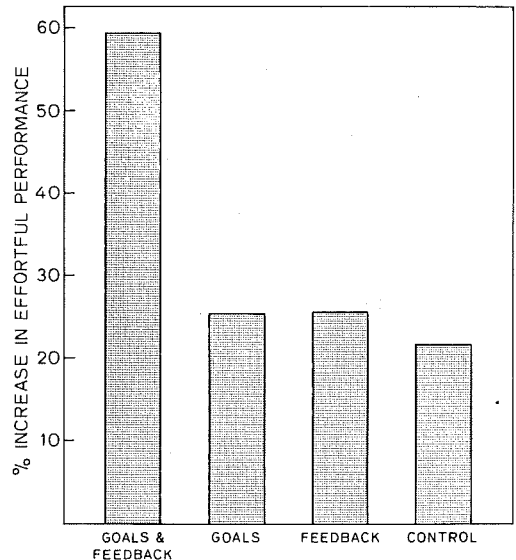


Figure 8. Change in motivational level as a function of goals and performance feedback (Bandura & Cervone, 1983).

mined by people's beliefs that they can attain the goals they set for themselves. Those who have a low sense of efficacy are easily discouraged by failure. Those who are assured of their capabilities intensify their efforts when they fail to achieve what they seek and they persist until they succeed.

Self-evaluation and perceived self-efficacy are good predictors of the degree of change in motivation when attainments fall short of goals. As can be seen in Figure 9, discontent over a substandard performance combined with high efficacy for goal attainment produces a marked increase in effort. A low sense of efficacy and low discontent over a substandard performance mobilize little effort. Either high discontent or high efficacy alone, result in a moderate increase in motivation.

These self-influences exert differential impact on motivation when attainments diverge from the comparative standard over a wide range of discrepancies (Bandura & Cervone, 1986). Perceived self-efficacy contributes to motivation across a wide range of discrepancy conditions. The stronger the people's perceived efficacy that they can meet the challenging standard, the more they intensify their efforts. Discontent operates as an influential affective motivator when

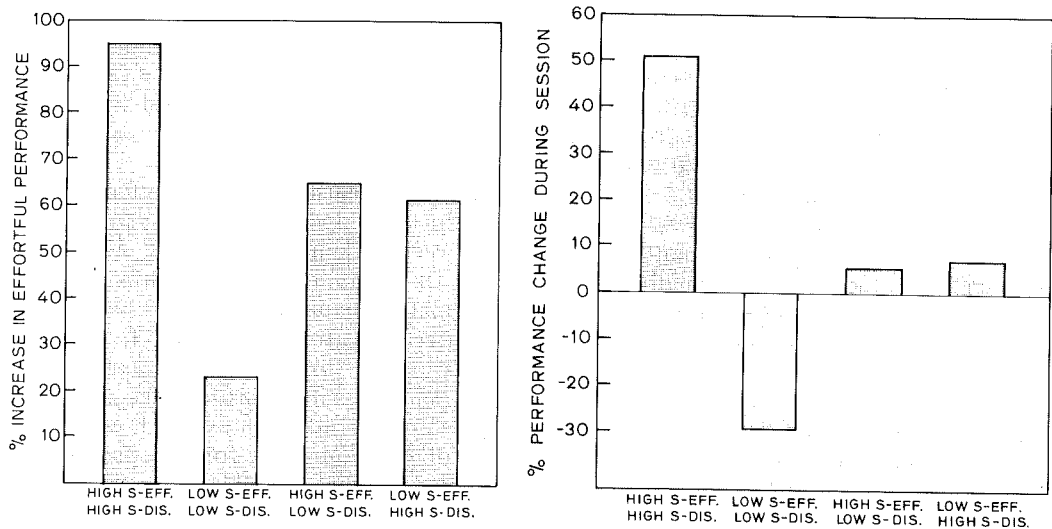


Figure 9. Change in motivational level shown by subjects in the goals and feedback condition as a function of differential combinations of levels of self-dissatisfaction (S-DIS) and perceived self-efficacy (S-EFF) for goal attainment. The left-hand panel shows the mean change for the entire session; the right-hand panel shows the mean change between the first and final minute of the session (Bandura & Cervone, 1983).

attainments fall substantially or moderately short of a comparative standard. The greater the dissatisfaction, the more people heighten their efforts. However, if they are quite satisfied with approximating or matching the standard they do not invest increased effort in the pursuit. When attainments surpass challenging goals, people's beliefs in their efficacy and their self-set goals determine their level of motivation. For accomplishments that require sustained effort, people do not expect to surpass each accomplishment in an ever-rising series of triumphs. Those who hold a strong belief in their efficacy, motivate themselves by setting goal challenges that create new discrepancies to be mastered for a sense of self-fulfillment. Thus, notable attainments bring temporary satisfaction, but people enlist new challenges as personal motivators for further accomplishment. Those who doubt they could muster the same level of effort again lower their aspirations. Their motivation declines.

When analyses of cognitive motivation focus on internal standards, self-evaluation, regulation of effort, and the like, the process may sound like one of self-inflicted burdens. Extreme examples readily spring to mind of people who drive themselves relentlessly in pursuit of unattainable goals, and whose ever-

rising standards negate any sense of self-fulfillment along the way. But this is not the usual result of self-motivation. Findings of this line of research reveal that motivation by personal challenge builds efficacy through accomplishments and a continuing source of interest. Without aspirations and engrossment in activities, people are unmotivated, bored, and uncertain about their capabilities. Life without elements of challenge can be rather dull.

#### Conception—Matching Mechanism in Modeling

Another important aspect of human agency concerns the mechanisms by which thought is transformed into new performance skills. Here the issue of interest centers on the construction of competencies rather than the regulation of motivation or the orchestration of preexisting skills.

Psychological theories have traditionally assumed that learning can occur only by performing responses and experiencing their effects. If learning was confined to trial and error groping the prospects of survival would be slim because mistakes can produce costly or even fatal consequences. Those who managed to survive would spend their lives

tediously trying to ferret out the language, behavioral styles, and social practices of their culture from the effects of their fortuitous actions. Fortunately, this perilous and laborious process can be markedly abbreviated by the informative power of modeling. Evolution clearly favours those who can learn by observation. Humans have evolved an advanced cognitive capability that enables them to expand their knowledge and psychological competencies by observational means. Indeed, virtually all learning phenomena resulting from direct experience occur on a vicarious basis by observing other people's behavior and its consequences for them.

A special power of modeling is that it can transmit simultaneously knowledge of wide applicability to vast numbers of people through the medium of symbolic models. By drawing on modeled patterns of thought and behavior, observers can transcend the bounds of their immediate environment. With the enormous advances in the technology of communication, observational learning from the symbolic environment is playing an increasingly influential role in shaping human thought patterns, attitudes, and styles of behavior.

#### *Cognitive Reconstruct and Resurrection of Learning*

Peripheralistic theories of learning, which contend that actions are shaped directly by their outcomes, have fallen in disfavor. Most learning theorists had already parted company with the peripheralistic view before cognitivism began its ascendancy. Unfortunately, disputes over the mechanisms of learning created a jaundiced view of the phenomenon of learning itself. The advent of the computer model accelerated the shift of interest from the acquisition of behavioral competencies to the processing, storage, and retrieval of information.

As the concerns of psychological theorizing and research turned toward questions of how knowledge is gained and represented, the fundamental issues of how behavioral competencies are developed were trivialized or simply ignored. Tversky (1982) traces the decline and recent resurrection of learning in psychology. Learning was initially supplanted by memory for discrete bits of information, sentences, and prose passages. Memory, in

turn, was later recast as a problem of comprehension. Eventually comprehension was construed as a problem of acquiring factual knowledge and procedural knowledge which provides the decision rules for solving given tasks.

Construing learning in terms of factual and procedural knowledge is well suited for cognitive problem solving. But, there are many domains of activity that require additional mechanisms to get from knowledge structures to performance skills. Knowledge and cognitive skills are necessary, but insufficient for skilled performance. A novice given complete information on how to ski, a set of decision rules for the production system, and then launched from atop a mountain would most likely end up in an orthopedic ward or an intensive care unit. A comprehensive theory must address itself to performance mechanisms as well as to knowledge structures.

#### *Skill Development as a Conception-Matching Process*

In social cognitive theory, skill development is analyzed as a conception-making process. In observational learning, people extract the rules underlying specific modeled activities and retain this knowledge in the form of conceptual representations. These conceptions later serve as guides for response production and as internal standards for response correction. Learning involves a similar conception-matching process regardless of whether the conception is derived from observing the behavior being modeled or is constructed from observing the effects of one's trial-and-error actions. Conceptions of complex behavior can be symbolically constructed much faster from observing the behavior modeled in an already integrated form than from trying different actions and examining how well they work.

Conceptions are rarely transformed into appropriate performance without error on the first attempt. Skilled performances are usually achieved by corrective adjustments in conception-matching during the behavioral production phase of observational learning. Physical enactment provides the vehicle for translating conception to skilled action. Feedback from symbolically-guided actions is compared against the internal conception.

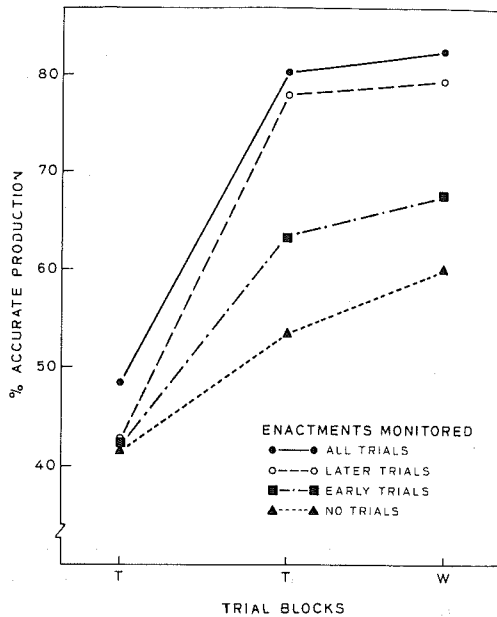


Figure 10. Behavioral production accuracy as a function of timing of visual monitoring of enactments. *T* represents training trials; *W* represents trials in which modeling and visual monitoring of reproductions are completely withdrawn. Plotted from data of Carroll and Bandura, 1982.

The behavior is then modified by the comparative information to achieve close match between conception and action. The amount of overt enactment needed to correct mismatches depends on the complexity of the activity and the extent to which the requisite subskills have already been developed.

Observational learning of intricate behavior is greatly aided by conception acquisition and optimal timing of observation of enactments (Carroll & Bandura, 1982, 1985). Learners do not reproduce modeled patterns very accurately if they cannot see what they were doing, or if they monitor their enactments before they have formed an adequate conceptual representation of the activity (Figure 10). Without a clear conception to serve as a standard during initial phases of learning, they cannot use the feedback correctively. However, after learners have conceptualized the behavior pattern, monitoring their enactments markedly facilitates accurate performance. The more accurately the conception, the better is the performance. Ongoing monitoring of one's enactments greatly enhances observational learning by facilitating detec-

tion of mismatches between performance feedback and conception.

Human behavior is regulated by multilevel systems of control. Once behavior patterns become routinized, they no longer require higher cognitive control. Their execution can be largely regulated by the lower level sensory-motor system. After people know what to do, have gained proficiency in translating it into corresponding action by monitored enactments, and have routinized it through repeated execution, they perform skillfully without requiring guides or augmented feedback (Carroll & Bandura, 1982; 1985). However, when routinized behavior fails to produce expected results, the cognitive control system again comes into play. Control reverts to the lower control systems after adequate means are found and become the habitual ways of doing things.

#### Role of Thought in Reciprocal Determinism

The discussion thus far has centered on how thought serves as a major instrument of personal agency. However, thought operates within a larger causal matrix. Social cognitive theory explains psychosocial functioning in terms of triadic reciprocal causation. Figure 11 presents a schematization of triadic reciprocity.

In this model of reciprocal determinism, behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other. Reciprocal influences are not necessarily of equal strength, nor do they all occur simultaneously. It takes time for a causal factor to exert its influence and activate reciprocal effects. In reciprocal causation, thought is both producer and product of influence.

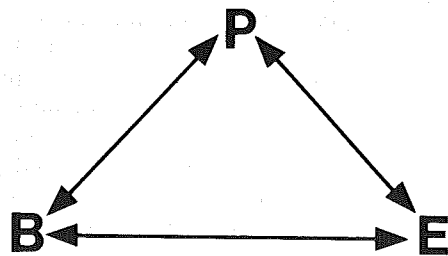


Figure 11. Schematization of triadic reciprocal causation.

### *Distinguishing Between Mechanisms and Modes of Change*

Models of causation affect what is selected as the locus of intervention for improving human functioning. Developments in the field of psychological change rely increasingly on cognitive mechanisms. On the other hand, performance treatments operating through mastery experiences are proving most powerful in producing cognitive, affective, and behavioral changes. The apparent divergence between cognitive theory and action-oriented treatments can be reconciled by distinguishing between process and means. Cognitive factors mediate psychological changes, but the cognitive factors can be developed and altered most readily by enactive mastery.

Modes of influence that rely heavily on verbal analyses of faulty thinking and on verbal persuasion are usually labeled as cognitive treatments. Such approaches have come under fire from radical behaviorists. They raise the spectre of disembodied mentalism. They relabel thought as verbal behavior and argue that behavior cannot cause behavior, only influences outside the organism can. They point to evidence that verbal modes of treatment are no more effective, and often less so, than are behavioral techniques. If one looks carefully beneath the surface of such critiques, the issues take on a different complexion.

Thoughts are brain processes, not disembodied mental states. Were one to perform Bunge's (1980) hypothetical brain transplant, the donor's "psychic" life would accompany the brain to the recipient rather than stay behind with the donor as a separate mental entity. To christen thought as verbal behavior is to stretch the definition of behavior to the point where it ceases to have any meaning. One can have thoughts without words. Preverbal children, deaf-mutes, and aphasiacs are not thoughtless. To equate thoughts with verbalism is to confuse the nature of the thought probe with the phenomenon being assessed. Cognitive processes are not publicly observable, but they have indicants through which they can be known indirectly. Verbal probes provide one indirect means of measuring cognitive processes. Nonverbal thought probes also provide indirect ways of measuring what people know and how they are thinking.

The field of psychological change is not well served by false dichotomies that there exist pure cognitive and behavioral treatments. One would be hard pressed to find a "behavioral" method that does not rely, at least in part, on cognitive conveyance, or a "cognitive" method that is devoid of any performance elements. To label verbal modes of influence as cognitive and action modes as behavioral is to confuse means and mechanisms of operation. Human thought is changed by informative experiences flowing from actions, as well as by conversations. Indeed, even Piaget's theory of cognitive development depends almost entirely on exploratory actions as the prime source of knowledge and thinking skills. Because thought is changeable by the influence of word, action, and example, treatments relying on these different modalities are all cognitive. The issue of interest is their relative power.

There is a widespread misconception that the modality of treatment must match the modality of dysfunction: Behavioral dysfunctions presumably require an action-oriented treatment; emotional distress requires an emotive-oriented treatment; and faulty thinking requires a verbally-oriented treatment. In fact, powerful mastery experiences can effect changes in all modalities of functioning — motor, cognitive, and affective (Bandura, Jeffrey, & Gajdos, 1975). Such experiences instill a strong sense of coping efficacy, and eliminate defensive behavior, physiological stress reactions, and faulty thought patterns. Moreover, nightmarish dream activity is more amenable to change by coping mastery experiences than by interpretive dream analysis.

Over the years, efforts to treat psychosocial dysfunctions have relied extensively on the interview as the main vehicle of psychological change. While verbal analysis and persuasion can produce some results, it is difficult to achieve consistently major changes in human behavior by talk alone. Guided mastery is usually more powerful than verbal restructuring in eradicating both dysfunctional styles of behavior and faulty ways of thinking (Bandura, 1977; Biran & Wilson, 1981; Emmelkamp, Kuipers & Eggeraat, 1978). Contemporary reviews of outcome studies generally show that verbal techniques without guided mastery experiences are relatively

weak (Eifert, 1984; Ledwidge, 1978). Earlier reviews similarly documented that behavioral techniques depend on cognitive mediation for their effects (Bandura, 1969; Brewer, 1974). Neither insulated verbalism nor insulated actionism harvest superior results.

Performance mastery is usually presented as an integral part of cognitive behavior therapy. Erroneous beliefs and faulty habits of thinking are analyzed by examining the evidence for and against the misbeliefs. But, in addition, new ways of behaving are modeled and practised to develop effective styles of thinking and behaving. However, the performance mastery part of cognitive behavior therapy is not well developed. All too often people are told how they should behave, but they are left to their own devices to develop the new styles of behavior. Success depends on a number of factors: Whether people are provided with the cognitive and social skills to perform effectively; whether they have sufficient positive incentives to devote the time and effort needed to develop new styles of behavior; whether they choose the right places to try their new ways; and whether they have social supports for personal change. Outcomes are uncertain when people have to create, by themselves, the conditions necessary for their own change. Success is more reliably achieved when people are aided in their mastery efforts.

Within the model of triadic reciprocity, action, cognition, and environmental factors act together to produce changes. The causal contribution of cognition is, therefore, best understood and used in concert with behavioral and environmental interactants. Treatment of phobic disorders illustrates this point. Phobias are rarely eradicated by thought analysis alone. Although performance successes are forceful persuaders, they do not necessarily ensure rapid progress or generalized changes. The impact that performance attainments exert depends on what is made of them. Changes result from cognitive processing of performance information rather than from the performances per se. For example, among driving phobics, all of whom have been helped to navigate the same difficult routes, some judge themselves thoroughly efficacious and drive around unimpededly; others retain some self-misgivings about their capabilities and drive circumscribedly; while

still others judge their efficacy as confined to the particular route mastered but remain otherwise immobilized by their perceived inefficacy, despite their performance successes. The degree and generality of change is mediated by changes in coping efficacy gleaned from performances rather than changes being directly forged by the performed responses. When self-referent thought attenuates the force of performance accomplishments, this does not mean that enactive mastery should be abandoned for talk. Rather, analysis of how people are reading their performances provides guides for how to structure mastery experiences to make them more persuasive. This requires powerful disconfirmatory tests that ceasing defensive behavior does not have injurious effects, and confirmatory tests that one can exercise control over potential threats.

It is by analyzing thinking patterns that one can best discern the type and amount of mastery experiences needed to alter self-debilitating thought. Psychological changes can, of course, be effected without attending to cognitive processing of experiences by programming massive mastery experiences that eventually persuade even the most recalcitrant self-doubters. By ignoring cognitive interactants, one sacrifices understanding of the mechanisms mediating change, retards the rate of progress which depends on optimally persuasive behavioral tests, and jeopardizes generalization of change.

Because of the interactive relationship between thought, affect, and action, psychological influences are not exclusively cognitive or behavioral. Nor does their strength depend simply on adding or deleting cognitive and behavioral elements as though they were independent modules of influence. Rather, they act bidirectionally to shape the course of personal and environmental change.

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