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Recycling Misconceptions of Perceived Self-Efficacy

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This commentary addresses misconceptions concerning perceived self-efficacy contained in the article by Eastman and Marzillier. People who regard themselves as highly efficacious act, think, and feel differently from those who perceive themselves as inefficacious. Self-percepts of efficacy thus contribute significantly to performance accomplishments rather than residing in the host organism simply as inert predictors of behaviors to come. A substantial body of converging evidence is reviewed, lending validity to the proposition that perceived self-efficacy operates as one common mechanism through which diverse influences affect human action, thought, and affective arousal.

People are not simply reactors to their immediate environment or steered by past stimulus inputs. Most of their behavior, except for patterns that eventually become routinized, is partly guided by the exercise of forethought. Among the forms of forethought that affect action, none is more central or pervasive than people's judgments of their capabilities to deal with different realities. In their daily lives they continuously have to make decisions about what courses of action to pursue, how much effort to invest in them, and how long to continue those they have undertaken. Because acting on misjudgments of personal capabilities can produce detrimental consequences, proper appraisal of one's own efficacy has considerable functional value.

Students of behavior do not all worship at the same theoretical altars. The notion that people can influence through self-referent thought how they behave does not sit well with those who find behavioristic premises more to their liking. In the latter view, contingent stimuli regulate

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behavior. Thoughts are merely by-products of conditioned responses. As Popper and Eccles (1977) point out forcefully, the epiphenomenalism argument is a self-negating view. If thoughts are simply epiphenomenal residues of conditioned responses, and proponents apply this analysis to their own thoughts, they can hardly argue the truth value of their view. One can analyze how the conditioned responses yielding such a cognitive by-product were acquired. But it becomes pointless, from this perspective, to champion the rightness of the cognitive residues of a behaviorist's conditioned responses over those of a cognitivist's conditioned responses, any more than one could argue that a conditioned pecking response is truer than a conditioned bar press. To grant thought causal efficacy is not necessarily to invoke a disembodied mental state. When viewed from the social learning perspective, people engage in integrative, reflective, and creative forms of thought, all of which constitute cortical processes, without having to make conditioned responses the oracle.

Efforts to reanalyze the structure and function of self-referent thought in human functioning from a behavioristic framework typically appeal to the model of contingency control. Environmental forces in the form of situational cues and outcome reinforcers serve as the agency of action. However, the limitations of explanations in terms of contingency control have become all too apparent with growing evidence that human behavior is often unswayed by the stimuli that precede it and the outcomes that follow it (Estes, 1971). The history of past outcomes is thus coming to bear a heavier explanatory burden as the controlling agent of behavior and as the substitute for reflective and anticipatory thought.

In the causal scenario proposed by Eastman and Marzillier (1984), thought can affect action but the control of action resides in expected outcomes. Self-percepts of efficacy are converted to predictors of future behavior that seem to play little role in its realization. This reconceptualization rests on a number of misconceptions of perceived self-efficacy and a truncated representation of causal sequences in which expected outcomes are disembodied from the self-judged performances upon which they are conditional. One cannot conjure up outcomes without giving thought to what one is doing and how well one is doing it.

Perceived Self-Efficacy: Generative Capability Not Component Acts

Perceived self-efficacy is concerned with people's judgments of their capabilities to execute given levels of performance. Such self-perceptions are neither defined nor measured in terms of motor components of an act, as Eastman and Marzillier imply, any more than one would construe linguistic self-efficacy as a collection of words or a colony of fixed sentences

in a verbal repertoire. There is a substantial difference between possessing cognitive, social, and motor subskills and being able to use them effectively for diverse purposes under diverse circumstances.

The importance of distinguishing between the subskills one possesses and judgment of what one can do with them is illustrated in the research of Collins (1982). She selected children of low, average, and high mathematical ability on the basis of standardized arithmetic tests. Because perceived self-efficacy is partially independent of subskills, children of high and low perceived mathematical self-efficacy were identified within each ability level. The children were then asked to solve difficult arithmetic problems. At all levels of arithmetic ability, those who judged themselves as efficacious solved more arithmetic problems, chose to rework more of the problems they had failed, and did so more accurately. Perceived self-efficacy predicted positive attitudes toward mathematics, but ability did not. Moreover, perceived self-efficacy even predicted children's causal attributions. Those who perceived themselves to be highly efficacious attributed their failures to insufficient effort, whereas those who regarded themselves as inefficacious ascribed their failures to deficient ability.

Perceived self-efficacy represents a generative capability in which multiple subskills must be flexibly orchestrated in dealing with continuously changing realities, often containing ambiguous, unpredictable, and stressful elements. Self-percepts of efficacy are typically measured in terms of variable use of the subskills one possesses under different situational demands. For example, in measuring driving self-efficacy, people are not asked to judge whether they can turn the ignition key, shift the automatic transmission, steer, accelerate and stop an automobile, blow the horn, monitor signs, read the flow of traffic, and change traffic lanes. Rather they judge, whatever their subskills may be, the strength of their perceived self-efficaciousness to navigate through busy arterial roads, congested city traffic, onrushing freeway traffic, and twisting mountain roads. The motor components of driving are trivial, but the generative capability of maneuvering an automobile through congested city traffic and speedy freeways is not. A performance task does not summon a fixed act. In judging their perceived capability to drive in congested city traffic, people have to judge how well they can manage the different traffic conditions that might arise. The trivialization of perceived self-efficacy misrepresents how skills, task demands, and self-percepts of efficacy are conceptualized.

Eastman and Marzillier resurrect the trite argument that because snake phobics possess a grasping response the motor "components of the act" are "trivial" and hence, perceived self-efficacy in handling a reptile is not at issue. In coping with a reptile, one is not dealing with a grasping response directed toward an inert object by a decorticate organism. When snake phobics verbalize aloud their thoughts as they consider whether or not to at-

tempt a given course of action, they are accessing their perceived capabilities for controlling a writhing snake, rather than whether or not they possess a grasping response (Bandura, 1983). Similarly, in judging whether they are sufficiently efficacious to venture near a caged snake, they are accessing not their ambulatory capacity but how well they would be able to fend off a snake should it somehow take leave of its cage. The adeptness with which phobics judge they can execute given tasks and manage escalating coping demands, which may ensue while performing a given activity, is very much on their minds.

It takes skill to control shifty reptiles, as therapists who minister to phobics and as living herpetologists who handle poisonous snakes will testify. The difference between herpetologists who are initimately acquainted with hospital emergency rooms and those who have not had call for such services is not in their grasping response, but in the adequacy of their coping strategies for handling reptiles efficaciously. Perceived coping efficacy is reliably raised with prompt reductions in fear and phobic behavior by explicitly modeling effective strategies for controlling phobic objects, which observers later put to good use (Bandura, Reese, & Adams, 1982).

Marzillier and Eastman (1984) claim that it is "impossible to exclude considerations of outcomes from any assessment of personal-efficacy." Quite the contrary. Athletes can judge their running capabilities, students their problem-solving capabilities, and salespersons their sales capabilities quite apart from the trophies, praise, or cash their performances might bring them. Social tasks involve transactional activities in which the behavior of others constitutes an important part of the coping demands. Thus, for example, dealing with a brawny antagonist calls for greater agility and physical efficacy than does controlling a puny one. Perceived efficacy for managing different types of social predicaments concerns a practical matter of how best to scale social coping demands rather than a conceptual one about efficacy and outcome beliefs and their separability. Some efforts have already been made to extend self-efficacy theory to the domain of social competencies (Goldfried & Robins, 1982; Kanfer & Zeiss, 1983, Kazdin, 1979; Moe & Zeiss, 1982). This is hardly an issue over which to spill printer's ink.

Marzillier and Eastman wonder whether a writhing snake in one's hand is an act or outcome. In the excercise of self-efficacy, a writhing snake is not an act, it is a predicament calling for a controlling strategy. People who believe they have the skill to exercise control will take reptile in hand, whereas those who believe they lack controlling capabilities will let slithering snakes lie. Similarly, people who judge they can manage the traffic predicaments likely to arise in certain classes of situations, will drive in

those settings but not in settings where they believe traffic demands exceed their capabilities. In short, efficacy is not a discrete act, it is the exercise of control.

PERFORMANCE IS CAUSALLY PRIOR TO OUTCOMES

Outcomes do not appear disembodied from actions. How one behaves largely determines the outcomes one experiences. Similarly, in thought, the types of outcomes people anticipate depend largely on their judgments of how well they will be able to perform in given situations. To cite a previous example (Bandura, 1978a), which Eastman and Marzillier quote only partially, drivers who judge themselves inefficacious in navigating winding mountain roads will conjure up outcomes of wreckage and bodily injury, whereas those who are fully confident of their driving capabilities will anticipate sweeping vistas rather than tangled wreckage. In the clinical cases that Eastman and Marzillier themselves cite, the clients envision adverse consequences because they regard themselves as inefficacious in coping with environmental demands. Evidence to be presented shortly reveals that variation in how adequately people judge they can perform given activities accounts for much of the variance in the types of outcomes they come to expect.

Contrary to the misbelief of Eastman and Marzillier, self-efficacy theory does not include among its premises the implausible notion that people are unconcerned about the adverse consequences they envision flowing from their self-judged ineptness. Indeed, not only would such indifference be astonishing, but disregarding the anticipated results of self-judged deficiencies would necessarily diminish the functional value of self-efficacy judgments. It is because people see outcomes as contingent on the adequacy of their performance, and care about those outcomes, that they rely on self-judged efficacy in deciding which course of action to pursue and how long to continue a chosen course. They tend to avoid tasks and situations believed to exceed their capabilities, and thus invitations to trouble, but they undertake and perform assuredly activities they judge themselves capable of handling. The stronger their perceived self-efficacy, the more vigorous and persistent are their efforts on tasks beset with difficulty. The physical and psychological well-being of humans is better served by action based on self-appraisal of efficacy than by mindless leaps into action without regard to one's capabilities.

Although self-efficacy judgment is highly functional in the self-regulation of behavior, faulty self-appraisal of coping capabilities begets anxiety and behavioral dysfunction. Thus, phobics, who judge themselves as inefficacious, scare themselves and conjure up all kinds of calamities.

When asked to verbalize aloud their ongoing thoughts in the reptilian coping situation (Bandura, 1983), they visualize themselves as provoking the snake by squeezing it too hard, or dropping it and having to cope with an incensed snake at their feet. They promptly abort actions they commence when they find they do not know how to control the writhing beast in their hands. The most profound self-inefficacy involved perceived vulnerability to total loss of personal control rather than self-doubts about particular coping performances.

The prevalence of self-inefficacy thinking in phobic disorders is further revealed by Rappoport and Williams (1982). They recorded via a portable electronic device the ongoing thoughts of agoraphobics as they coped with driving situations in natural milieus. Self-appraisals of driving capabilities, and reappraisals as situational circumstances changed, figured prominently in clients' thinking as they took on, or shied away from, the situations confronting them. In these coping encounters they gave relatively little thought to injurious outcomes. If self-percepts foster actions judged to be relatively safe there is little need to dwell on catastrophic outcomes.

Eastman and Marzillier's conjecture that aerophobics avoid airliners because they fear death by crashing creates more explanatory problems for them than it solves. Rare is the passenger who ventures aloft who does not believe that planes crash and who is unafraid of fiery death by crashing. This calls to mind the agoraphobic who revealed the insufficiency of such pat explanations. This client, who suffered from a phobic dread of flying, explained that a plane crash would provide welcome relief from her tormented, impoverished life. Rather, what concerned her was her profound perceived inefficacy in exercising adequate control over her behavior while cruising aloft, thus rendering her vulnerable to behaving in a grossly inappropriate way in the aircraft. However, a few participant modeling trips convinced her that she was fully capable of exercising self-control. She became a frequent airline traveler, but she has not given up her beliefs that airliners crash from time to time or make hazardous crash landings due to mechanical malfunctions. Airline passengers who like living know that there is always a chance the airliner might crash, and insure themselves heavily in acknowledgment of the threat, but they are not deterred from flying by the possibility of a shattering death.

Suburban commuters who realize they run higher risk of maiming or death by driving their automobiles than by taking the commuter train do not foresake their cars for trains. All too frequent are roadside wreckage, twisted barriers, wailing ambulances, shocked survivors, and nightly telecasts presenting the slaughterous gore of the day. These are constant reminders of the perils of driving. Why do the prospects of maiming and death fail to stop commuters from driving, despite the most serious risks

and ready access to a suitable and less stressful alternative mode of transport? Marzillier and Eastman (1984) designate a plane crash as an intrinsic outcome of flying. An event that happens infrequently cannot be inherent to that activity.

Eastman and Marzillier seem to view operative capability as a fixed entity that is actuated invariantly regardless of situational demands. They may regard coping with a harmless versus a poisonous snake as "two identical tasks." I doubt that others would endorse the same margin of error in executing the required coping skill with harmless and poisonous serpents. If faulty performance may kill one, more expertise is called for than if errors may only bruise one. More stringent control demands higher self-efficaciousness; complete control demands the highest level of self-efficaciousness. Herpetologists do not scare themselves with visions of death and injury from commerce with poisonous reptiles—not from doubting their venomous threat—but because herpetologists regard themselves as fully skillful in controlling the behavior of reptiles.

Eastman and Marzillier argue that people infer their self-efficacy from imaged outcomes, but they fail to explain the ghostly source of these imaged outcomes if they are detached from the very performances upon which they are conditional. To return to our twisting mountain road, drivers who regard themselves as inept at navigating such pathways will conjure up injurious outcomes and thereby frighten themselves. Eastman and Marzillier place the source of the anxiety in the imagined death and injury. But the imaged death, which races the pulse and stirs the viscera, has a prior imaged performance cause: Defective driving that demolishes the automobile is causally prior to envisioning the death or injury of the driver. The inept driver hardly visualizes himself or herself moribund in the tangled wreckage and then concludes, "I must be an inefficacious driver." Fortunately, human causal thinking places actions before the outcomes that flow from them. It is this causal ordering that provides the basis for foresightful action.

Outcome expectations are dissociable from self-efficacy judgments when extrinsically arranged outcomes are only loosely linked to level or quality of performance. Such structural arrangements permit social biases to come into play, so the same performance attainments may produce variable, and often inequitable outcomes. Expected outcomes are also partially separable from self-efficacy judgments when extrinsic outcomes are fixed to a minimal level of performance, as when a designated level of work productivity produces a fixed pay but higher performance brings no additional monetary benefits.

According to Eastman and Marzillier, self-efficacy theory states that "fearful people conjure up the dreaded outcomes that might arise from engaging in feared activities." The theory states nothing so tautological. It is

perceived self-inefficacy to cope with potential threats, not fearful nature, that leads people to scare themselves by conjuring up calamities. This is not a trifling distinction. Leland (1982) examined, by multiple regression, many potential determinants of precompetition anxiety in young athletes. Perceived self-efficacy to execute the requisite athletic feats emerged as the major predictor, accounting for 40% of the variance in precontest anxiety, where as the measure of anxiety-proneness accounted for only 6% of the variance. Telch (1982) tested the comparative predictiveness of perceived coping efficacy and different indices of anxiety among treated agoraphobics. Perceived self-efficacy proved to be a good predictor of different facets of psychological change—including anticipatory fear, performance attainments in the behavioral posttreatment assessment, and self-initiated venturesome conduct in the natural milieu. Posttest autonomic arousal yielded only one correlate, and it was in a direction suggesting that self-percepts override arousal in regulating behavior. Anticipatory fear was related to behavior in the posttest but not in the natural milieu: In the natural environment, where venturesomeness is based more on self-initiative than on external bidding, people rely heavily on their perceived coping efficacy to decide what tasks to take on. Beck and Lund (1981) studied the force of health communications in which the seriousness of the disease and vulnerability to it were varied. Patients' perceived self-efficacy that they could execute the requisite health practices was a good predictor of whether they adopted them, whereas fear arousal predicted neither intention nor adoptive behavior.

I thought I had laid to rest (Bandura, 1978a) the issue of whether self-efficacy is defined and measured in terms of being able to perform tasks without anxiety. Alas, Eastman and Marzillier resurrect it but make no mention of the reply to the original query. The answer then and now is that perceived self-efficacy does not include anxiety in either the definition or the measuring devices. Self-efficacy scales ask people to judge their performance capabilities and not if they can perform nonanxiously. Indeed, considering the confused relationship that exists between anxiety arousal and behavior (Barlow, Leitenberg, Agras, & Wincze, 1969; Leitenberg, Agras, Butz, & Wincze, 1971; O'Brien & Borkovec, 1977; Orenstein & Carr, 1975; Schroeder & Rich, 1976), to include nonanxiety as a defining property of self-efficaciousness would diminish is predictive value.

Substantial benefits in psychological functioning accrue because behavior is not automatically controlled by fear. If fear arousal inevitably triggered avoidant action, the populace would find itself in phobic immobility. Because people can perform activities at weaker strengths of perceived efficacy despite high anxiety, they can function effectively even in the face of anticipated aversive consequences. Thus, perceived coping ef-

ficacy is a strong predictor of phobic behavior, whereas injurious outcomes bear a weak relationship to behavior (Williams & Watson-Newhouse, 1984). Perceived self-efficacy retains its predictiveness of phobic behavior when variations in anticipatory and performance anxiety are partialed out, whereas the relationship between anxiety and phobic behavior essentially disappears when the influence of perceived self-efficacy is controlled (Williams, Dooseman, & Kleifield, in press). In two studies conducted by Lee (1984a, 1984b), one involving snake handling and the other assertiveness, perceived self-efficaciousness predicted performance much better than did expected outcomes. Similar findings are reported with athletic performances (Barling & Abel, 1983), sales performances (Barling & Beattie, 1983), preventive health practices (Beck & Lund, 1981), and smoking behavior (Godding Glasgow, & Klesges, 1982). In the latter studies, multiple-regression analyses reveal that when the effect of perceived self-efficacy is parceled out, expected outcomes add little to the prediction of behavior.

MISCONSTRUING ACTS AS OUTCOMES

Eastman and Marzillier's concerns about the term *outcome* is somewhat puzzling because its meaning is hardly shrouded in mystery. Dictionaries define an *act* as "a thing done" and an *outcome* as "something that follows as a result or consequent of an activity." This conventional usage for both the terms *act* and *outcome* is followed in self-efficacy theory. A self-percept of efficacy is a judgment of one's capability to accomplish a certain level of performance. Outcome expectations are the likely consequences such behavior will produce. In the example used to illustrate this difference, the belief that one can jump 6 feet is a self-efficacy judgment; the social recognition, applause, trophies, and self-satisfaction anticipated for such a performance constitute the outcome expectations.

An outcome is the consequence of an act, not the act itself. Serious confusions arise when acts are converted into outcomes, as when Eastman and Marzillier suggest that jumping 6 feet is a consequent. An act must be defined by criteria that state what it is—for example, a leap upward of a designated height. In interpreting a 6-foot jump as an outcome, Eastman and Marzillier misconstrue the specifying criteria of an act as the consequences that flow from it. If an act is defined as a 6-foot leap, then a 6-foot leap is the realization of the act not the consequence of it. To conceptualize an act as the outcome of itself is to destroy the conventional meanings of act and outcome.

Outcomes include the natural effects of actions as well as extrinsic social and material effects, and self-evaluative reactions. I do not hold the

view that an injury sustained by a jumper upon landing is not an outcome of the act. It most certainly is. But failure to complete a designated act (e.g., knocking off a crossbar by failure to clear 6 feet) cannot be the outcome of the act, as Eastman and Marzillier contend, because it was never brought into being. Rather, the failed jump is an incomplete act that produces its own, divergent, collection of outcomes, be they social, physical, or self-evaluative.

GAUGING SELF–PERCEPTS OF EFFICACY

Let us forgo quibbles about such minutiae as the semantic equivalence of the standard descriptor "quite uncertain" at the low end of the self-efficacy scale and its description as "high uncertainty" in the Method sections of articles, and whether degrees of certainty reflect probabilistic likelihoods of accomplishment. Because skills are executed variably rather than identically under different conditional circumstances, strength of perceived self-efficacy involves probabilistic judgments. To measure self-judged efficacy, what is asked of subjects is quite simple and straightforward: They are given a list of performance tasks and instructed to designate those they judge they can accomplish as of then. For each task so designated, they rate the strength of their belief using a certainty scale ranging in 10-unit intervals from 10 to 100. By assessing self-percepts of efficacy commensurate with the precision with which performance is measured, the microanalytic methodology permits detailed analysis of the relationship between self-efficacy judgment and action.

Eastman and Marzillier express reservations because the efficacy strength scale begins at a value of 10. Description of the efficacy assessment methodology states clearly that people are instructed to make *two* judgments for each activity included in the efficacy scale: First, they judge whether or not they can accomplish a given performance, and second, *for those items they judged they could do,* they rate the strength of their perceived efficacy using the efficacy scale with a value of 10 as the low point on the scale. It would be nonsensical to include a zero value on the scale because, having already indicated they can do something, they should not be asked whether they can do it with zero certainty. The first rating in the two-step judgment addresses the judgment of total inefficacy. Contrary to Marzillier and Eastman (1984), there is nothing paradoxical about expressing varying levels of doubt concerning one's perceived capabilities. Those who may be troubled by the dual-judgment format need only add the zero point to the scale and use the single-judgment format. Indeed, in studies in

which the effects of efficacy strength are of central concern we use the single-judgment format with the scale ranging from 0 to 100. This pseudocontroversy concerning the present or absent zero involves a trivial matter of format rather than a conceptual issue.

The degree of relationship between self-efficacy judgments and action are quantified in several ways. Correlations are computed between aggregate scores of efficacy judgments and performance attainments. At a more detailed level of analysis, degree of congruence between efficacy judgment and action is gauged by recording whether persons judge themselves capable of performing each of the various tasks using a cutoff strength value and computing the percentage of correspondence between self-efficacy judgment and actual performance on individual tasks. Dichotomizing self-efficacy judgments on the basis of some minimal strength value inevitably loses predictive information. For example, if a low efficacy strength value is selected as the criterion of self-efficacy (e.g., 20), a weak sense of efficacy (30) is treated equivalently to complete certitude (100). A more refined microanalysis of congruence is provided by computing the probability of successful performance as a function of the strength of perceived self-efficacy. All three indices generally reveal a close relationship between self-efficacy judgments and action whether efficacy is developed by enactive mastery, vicarious experience, cognitive coping, or elimination of anxiety arousal.

In discussing the dichotomized index of self-efficacy, Eastman and Marzillier argue that if performance tasks are hierarchical and if persons know how well they can perform, then congruence below that point is assured. This line of reasoning overlooks the fact that if persons misjudge their level of capability then hierarchical ordering yields high discordance. For example, if in a 10-level hierarchy persons judge themselves capable of mastering level 8 but in actual tests accomplish tasks corresponding to level 4, they are guaranteed a whopping 40% discordance between efficacy judgments and action. In short, a task hierarchy in no way assures congruence. When congruences between self-percepts and action are computed only on the subset of tasks that subjects had never performed in the behavioral pretest, the tasks subjects know they can perform because they have already done them are excluded from the analysis.

Self-efficacy scales vary in their structure depending on the domain of functioning and the specificity with which it is being examined. Some scales are ordered throughout their range (Bandura & Cervone, 1983). Others are ordered at the lower but not at the upper region of the scale (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977). And still others include heterogeneous activities that admit no particular order (Condiotte & Lichtenstein, 1981; DiClemente, 1981). Behavior corresponds to judged self-

efficacy regardless of whether tasks are fully hierarchical, partially hierarchical, or not ordered at all. A statistical procedure devised by Cervone (1984) to estimate chance congruence, whatever form the efficacy scales take, shows concordances between self-percepts of efficacy and action to be highly significant.

HUMANS AS ACTIVE PRODUCERS RATHER THAN PASSIVE PREDICTORS OF PERFORMANCE ATTAINMENTS

Self-percepts of efficacy are not simply inert predictors of future behavior. People's beliefs about their capabilities influence how they behave, their thought patterns, and the emotional reactions they experience in taxing situations. Those who regard themselves as highly efficacious set themselves challenges (Bandura, 1977a; Locke, Frederick, Lee, & Bobko 1984), intensify their efforts when their performances fall short of their goals (Bandura & Cervone, 1983, 1984), persevere despite repeated failures (Brown & Inouye, 1978; Schunk, 1981), make causal ascriptions for failure that support a success orientation (Collins, 1982), approach potentially threatening tasks nonanxiously, and experience little in the way of stress reactions (Bandura et al., 1982; Leland, 1982). Such self-assured endeavor produces accomplishments. In marked contrast, those who regard themselves as inefficacious shy away from difficult tasks, slacken their efforts and give up readily in the face of difficulties, dwell on their personal deficiencies thus detracting attention from task demands, lower their aspirations, and suffer much anxiety and stress. Self-misgivings undermine performance. Self-percepts of efficacy thus contribute significantly to performance attainments rather than serve merely as forecasters of behaviors to come.

In their alternative hypothesis Eastman and Marzillier divest self-percepts of efficacy of determinative properties as if they simply reside as predictors of future behavior in the host organism. How future behavior gets realized remains unspecified. An organism that can forecast the future, but has no capacity for self-influence, must be steered to eventual attainments by environmental forces. In behavioristic theory external stimuli and past stimulus inputs provide the direction. In other contexts of their article Eastman and Marzillier are willing to grant thoughts of outcomes the capacity to affect behavior, but they seem averse to grant thoughts of personal competencies—on which the very expected outcomes depend—a similar capacity to affect what people choose to do.

Behavioral analysts typically focus on research in which self-percepts of efficacy are fostered enactively because there is a behavior to latch onto.

One can claim that self-efficacy is simply an inert reflector of prior performance. However, enactive modes of influence provide the least critical findings from the standpoint of demonstrating that self-percepts of efficacy function as proximal determinants of how people behave and the amount of stress they experience. Of considerably greater interest, and more challenging to theories contending that people cannot affect through self-referent thought what they will do, are studies in which self-percepts of efficacy are altered through nonperformance modes of influence (Bandura, 1982a). Such influences provide no performance information for judging changes in one's self-efficacy. We shall return to this issue shortly.

Even for enactively developed self-efficacy, the simple view that self-percepts of efficacy are reflective imprints of past action runs into considerable difficulty. Performance information is not inherently enlightening. Rather, it becomes instructive only through cognitive processing. This is because many factors affect level of performance that have little to do with ability. Self-appraisal of efficacy is, therefore, a judgmental process in which the relative contribution of ability and nonability factors to performance successes and failures must be weighed. The extent that people will alter their self-percepts of efficacy from performance experiences will depend upon such factors as the difficulty of the task, the amount of effort they had to expend, their physical and psychological condition at the time, the amount of external aid they receive, the situational circumstances under which they perform, the quality of the apparatus, the temporal patterns of their successes and failures, and the adequacy with which they monitor and recall their performance experiences.

That self-percepts are not simply imprints of past actions is revealed in fine-grain analyses of performance attainments and shifts in self-judged efficacy at each step in a change process (Bandura et al., 1982). Self-percepts of efficacy often exceed, only occasionally match, and sometime remain below performance attainments, depending on how deeds are cognitively appraised. Because people are influenced more by how they read their performances than by the performances pe se, it is not uncommon for perceived self-efficacy to predict subsequent behavior better than does past performance (Bandura, Adams, Hardy, & Howells, 1980; Bandura, et al., 1982; DiClemente, 1981; Kendrick, Craig, Lawson, & Davidson, 1982; McIntyre, Lichtenstein, & Mermelstein, 1983; Williams et al., in press). When perceived self-efficacy is raised through enactive mastery to differential levels the amount of performance experience needed to yield designated levels of perceived efficacy varies markedly (Bandura et al., 1982). Test performances at each level are better predicted by perceived self-efficacy than by the instating performance. This is not to say that perceived efficacy is always a better predictor than past performance. Massive mastery experiences eventually produce maximal change in all modalities of functioning for most par-

ticipants so that ceiling effects may preclude differences. When performance tasks are ill-defined, people must judge their self-efficacy in terms of what they imagine tasks to be. Underestimating task demands produces errors in the direction of overassurance; overestimating task demands will bring errors in the conservative direction.

Lee (1983b) reasons that predictive comparison between action and perceived efficacy may be disadvantageous to behavior when behavior is gauged in relation to a familiar threat, whereas perceived self-efficacy is measured toward the familiar and a generalization threat. Hence, prior behavioral attainment may fare less well as a predictor in the generalization test. However, such an argument would strip behavior of predictive utility. There is little call for predicting what one has already done in a familiar situation. The value of predictors lies in their success in predicting behavior in new situations. Thus, scholastic aptitude scores are not used to predict how students will again score on the aptitude test, but how well they will perform in new scholastic pursuits calling for the types of skills measured by the test. In the experiments examining the relative predictiveness of past behavior and perceived efficacy (Bandura et al., 1977, 1982), the coping skills developed in treatment are the skills called for to manage generalization phobic objects. The familiar and generalization phobic objects were shown, in a separate study, to be equal in threat value, as measured by subjects' behavioral avoidance and fear arousal. Behavior is hardly disadvantaged in research design in which coping objects vary in familiarity and other characteristics but are equated for their threat value.

In experiments testing the different ways in which perceived self-efficacy affects psychological functioning, self-percepts of efficacy are measured in terms of performance capabilities, but the effects are measured in markedly different modalities. Consider a few examples: Discrepancy between personal standards and perceived self-efficacy to match those standards predicts depressive mood (Kanfer & Zeiss, 1983). Variation in strength of perceived coping efficacy predicts rises in heart rate and systolic and diastolic blood pressure (Bandura et al., 1982). Perceived problem solving efficacy predicts causal attributions (Collins, 1982). These are not situations in which past performance imprints can be proxy predictors of future performance.

Before leaving the issue of cognitive processing of enactive efficacy information, the confusion of acts with outcomes also warrants brief comment in this context. Completed and incompleted acts provide raw data, together with other sources of efficacy information, for self-appraisal of capabilities. Enactive accomplishments can strengthen self-percepts of efficacy even though the actions produce aversive consequences. A safecracker who deftly robbed a safe but got caught absconding with the loot would retain high efficacy in his safecracking capabilities but would perhaps alter his view of the risks involved.

Perceived self-efficacy partly determines how well people perform, which, in turn, can alter their self-percepts of efficacy in a mutually interactive way. It is not as though self-percepts of efficacy affect future performances but play no role whatsoever in earlier performance attainments. Questions about causal ordering of factors arise in enactively based influences when interactive processes are treated, as linear sequential ones, and causally prior self-efficacy determinants of past performance go unmeasured. Partialing out past performance underestimates the relationship between perceived self-efficacy and future performance because such a procedure removes the self-efficacy contributor to past performance.

In modes of influence that alter self-percepts of efficacy through observational and symbolic means, people do not execute any overt actions. Consequently, they have no performance data for reappraising their altered capabilities. Yet changed self-percepts of efficacy predict their subsequent level of performance (Bandura et al., 1977, 1980, 1982; Cervone & Peake, 1984; Kazdin, 1979).

Eastman and Marzillier suggest that, under such circumstances, people can judge their future performance from their pretest behavior. The most stringent test of the predictive power of perceived self-efficacy is to consider phobics treated by a nonperformance mode who could not complete even a single task in the pretest assessment. Given a common zero baseline, they have no pretest performance from which to foretell their degree of accomplishment at the end of treatment. Forty percent of the phobics receiving symbolic desensitization could not perform a single task in the pretest assessment (Bandura & Adams, 1977). Deep muscular relaxation was successively paired with imaginal representations of progressively more threatening snake scenes. This procedure was continued throughout the graduated series of threatening scenes until the participants' anxiety reactions to all scenes were completely eliminated. Their perceived self-efficacy and coping were then measured. The participants' perceived self-efficaciousness at the end of treatment differed markedly, ranging from a level of 6% to 67%. Their level of coping behavior was similarly varied, ranging from 6% to 58% performance attainment. The congruence between self-percepts of efficacy at the end of treatment and subsequent coping behavior was 83%. Since these phobics had a zero pretest baseline, there was nothing their pretest behavior could tell them except that they could do nothing.

Eastman and Marzillier also suggest that people draw on information provided by nonenactive modes of influence. Indeed they do. Self-percepts of efficacy are not fabricated from thin air. Self-efficacy theory specifies distinctive sets of efficacy indicators for each of the four modes of conveying efficacy information—enactive, vicarious, persuasory, and physiological (Bandura, 1982b). Through cognitive processing such information is weighed and integrated into self-appraisals of efficacy. As previously noted, peo-

ple who come to regard themselves as highly efficacious act, think, and feel differently from those who perceive themselves as inefficacious. They produce their future rather than simply foretell it.

Treatments relying on nonenactive modalities characteristically produce vast differences in behavioral improvement, ranging anywhere from 4% to 100% performance mastery. Repeated efforts to account for such diverse results in terms of anxiety indices, vividness of imagery, exposure times, and other possible predictors have brought disappointing yields. In contrast, perceived self-efficacy successfully predicts attainments in coping behavior regardless of whether the modes of treatment rely on enactive, vicarious, cognitive, or emotive means.

Considering that scientific excursions seek explanatory and predictive power, one would expect predictive success to be gladdening rather than perturbating. Eastman and Marzillier express disappointment because the tests of coping behavior include "discrete tasks." I do not know what definition of discreteness they have in mind, but I do know that the coping performances we measure involve streams of behavior with appreciable continuity. One cannot measure a boundless event. Behavioral changes, however complex and whatever forms they may take, must be measured in terms of demarcated performances. Recorders of necessity use boundary markers for scoring purposes, but there is nothing disjointed about agoraphobics spending a good part of the day during performance tests shopping in supermarkets, visiting busy department stores and venturing to upper floors via crowed elevators and escalators, traveling on risky California freeways and mountain roads, and then having meals in restaurants served by harried waiters (Bandura et al., 1980). Such behavioral tests involve flowing transactions with the physical and social environment over an extended time course that even exceeds the duration of a Rossini overture.

Marzillier and Eastman (1984) characterize complex situations as ones in which people are often uncertain about their capabilities. they cannot fully predict situational events, and they exaggerate what their actions will bring forth. These conditions hardly differ from those the authors have arbitrarily christened as "discrete." Driving phobics express uncertainties about their capabilities, they view traffic conditions as not entirely predictable, and they believe their inapt driving may create traffic mishaps. A mastery-oriented treatment provides them with the predictive knowledge, skills, and the perceived self-efficacy to manage whatever situations may arise.

The series of experiments testing the predictive generality of perceived self-efficacy across diverse modes of treatment was conducted with severe snake phobics. This type of disorder permits precise tests of mechanisms of change unconfounded by uncontrolled experiences arising from contacts with threats between sessions. The psychological functioning of these phobics was

markedly affected both behaviorally and cognitively (Bandura, 1978b). Their lives were constricted by defensive avoidance of social, recreational, and vocational activities. But even restructuring their daily activities did not ensure relief from distress. Most were repeatedly plagued by intensive ruminations and disturbing nightmares. With the aid of enactive mastery all of these phobics became supremely self-efficacious. They all began to participate in activities they formerly avoided because of their dread of snakes, and they achieved welcome relief from their recurrent nightmares. Eastman and Marzillier express disappointment because our "assessments of self-efficacy are locked on to discrete tasks," and allegedly we did not measure changes in perceived self-efficacy in coping with the threats in the natural milieu. This is an inaccurate claim. In point of fact, we measured changes in subjects' perceived self-efficacy in coping with snakes in the types of natural situations they had phobicly avoided (Bandura et al., 1977). Correlational analyses reveal that the higher the perceived self-efficacy in managing the snakes used in the performance tests, the greater the sense of personal efficacy ($r = .72$, $p < .001$) in coping with snakes in different natural settings.

Eastman and Marzillier also express displeasure with what they believe to be excessive popularity of the construct *self-esteem*. I shall forgo lengthy comment on this matter, except to note that self-esteem and self-efficacy represent different phenomena. Moreover, I do not know of any verified list of overpopular constructs that would warrant belittling self-esteem. Self-esteem pertains to evaluation of self-worth, whereas self-efficacy is concerned with personal capabilities. Individuals may regard themselves as highly efficacious at an activity from which they derive no self-pride (skilled bombardier), or judge themselves inefficacious at an activity but suffer no loss of self-worth (e.g., inept skaters). However, in many of the activities people pursue they cultivate self-efficacies in what gives them a sense of self-worth. Thus, both self-esteem and self-efficacy contribute in their own way to the quality of human life. Fortunately, the viability of constructs does not rest on theoretical taste.

SELF-EFFICACY AS MEDIATOR

Diverse lines of research provide converging evidence for the notion that perceived self-efficacy is a significant mediator of psychological functioning. The role of self-efficacy in coping behavior has already been discussed at some length. In the area of human stress, variations in strength of perceived self-efficacy predict the degree of subjective distress and autonomic arousal in taxing situations (Bandura et al., 1980, 1982; Leland, 1982). After perceived self-efficacy is strengthened, people manage the same task demands unper-

turbedly. Human despondency similarly accompanies perceived self-inefficacy to exercise control over valued outcomes (Davies & Yates, 1982; Devins et al., 1982; Kanfer & Zeiss, 1983).

Studies of pain tolerance support the view that pain endurance is mediated through changes in perceived self-efficacy (Reese, 1983). This holds whether self-management of pain relies on cognitive coping, self-relaxation, or placebo medication. Perceived self-efficacy to manage pain identifies those who achieve benefits from placebo medication. The changes accompanying psychological ministrations for physical maladies may result as much, if not more, from instilling beliefs in self-regulatory efficacy as from the particular palliative skills bestowed. Indeed, even procedures that may exacerbate pain but are presented in ways that enhance self-efficacy can produce beneficial results. Holroyd and Penzien (1982) told persons suffering from tension headaches that headaches would abate by tensing or by relaxing facial muscles. False feedback that they had achieved high control over tension or relaxation of their frontalis muscle instilled a strong sense of efficacy that they could abort or reduce the intensity of their headaches. The higher the perceived self-regulatory efficacy, the less they were plagued with headaches. The actual amount of change in EMG activity achieved in treatment was unrelated to the incidence of headaches. That perceived self-efficacy may mediate changes in health behavior receives further support from studies of postcoronary rehabilitation (Ewart, Taylor,, Reese, & DeBusk, 1983), pulmonary disease (Kaplan, Atkins, & Reinsch, 1983), and relapse and maintenance of smoking cessation.

In investigations of how perceived self-regulatory efficacy affects relapse in smoking cessation, people may achieve the same terminal behavior, but they do not exhibit the same level of perceived self-regulatory efficacy at the end of treatment. Compared to abstainers, relapsers express lower self-efficacy about their ability to resist smoking under subsequent instigating conditions. The higher the perceived self-regulatory efficacy, the more success in checking smoking during the follow-up period. In contrast, neither demographic factors, history of smoking behavior, nor degree of physical dependence on nicotine differentiated relapsers from abstainers (DiClemente, 1981; Killen, 1982; McIntyre et al., 1983). In a microanalysis of the relation between self-percepts of efficacy and smoking (Condiotte & Lichtenstein, 1981), perceived self-regulatory efficacy predicted, months later, which participants will relapse, how soon they will relapse, and even the specific situations in which they experience their first slip. Moreover, perceived self-efficacy at the end of treatment predicts how participants are likely to handle a subsequent relapse, should it occur. The highly self-efficacious subjects reinstate control following a slip, whereas less self-efficacious peers display a marked decrease in perceived self-efficacy and relapse completely.

A major source of cognitive motivation operates through internal standards and self-evaluative reactions to substandard and excelling performances. Whether negative discrepancies between standards and performance are motivating or discouraging is influenced by people's perceptions of their efficacy to attain the standard they set for themselves. Research corroborates perceived self-efficacy as one of several mechanisms governing the motivational impact of goal structures. A strong sense of self-efficacy for goal attainment fosters sustained effort, strong goal commitment, and superior performance (Bandura & Cervone, 1983, 1984; Locke et al., 1984).

Another line of research concerns the contribution of self-percepts of efficacy to intellectual achievement. The findings show that perceived self-efficacy is partially independent of cognitive skills but contributes significantly to performances requiring such skills. As Collins (1982) notes, low achievement may stem not only from lacking cognitive skills but also from using them poorly due to perceived self-inefficacy. Numerous studies have been conducted in which self-percepts of efficacy are enhanced for children with gross deficits in cognitive skills by the use of enactive mastery supplemented with goal structures, causal attributional feedback, social comparison information, self-verbalization of strategies, and incentives (Bandura & Schunk, 1981; Brown & Inouye, 1978; Schunk, 1981, 1982, 1983a,b,c). Enhanced perceived self-efficacy predicts increased persistence in seeking solutions, level of cognitive achievement, and intrinsic interest in formerly disliked activities. Regression analyses show that self-efficacy contributes to achievement behavior beyond the effects of cognitive skills.

The choices people make during formative periods shape the course of their lives. Betz and Hackett (1981) have been testing a causal model of career development in which perceived self-efficacy functions as a major mediator. The more efficacious students perceive themselves to be, the wider the range of career options they consider seriously and the more interest they show in them. Female students judge themselves as less efficacious in mastering the educational prerequisites of vocations dominated by men and shy away from such careers despite equality with males in actual verbal and quantitative ability. Using path analysis, Hackett (1981) found that sex, gender-role socialization, and high school preparation affect perceived self-efficacy in quantitative skills. Perceived self-inefficacy in dealing with numbers in turn affects mathematical anxiety and math-relatedness of college majors. These and other studies in this program (Taylor & Betz, 1983) shed important empirical light on how perceived self-inefficaciousness can constrict career pursuits.

The role played by self-percepts of efficacy in execution of skilled performance under competitive conditions is still another domain of achievement that is being actively explored. That a high sense of self-efficacy is a key to optimal performance has long been recognized in athletic circles.

After capabilities are perfected and massively practiced, perceived self-efficacy is often the difference between a good or a poor showing in athletic contests. This is because with highly perfected skills, a small lapse in effort or accuracy makes a major difference in outcome.

That self-percepts of efficacy may mediate athletic performance receives support in controlled laboratory analyses of the process (Weinberg, Gould, & Jackson, 1979; Weinberg, Yukelson, & Jackson, 1980). Lowering people's perceived physical efficacy by false feedback diminishes the amount of physical power they muster while performing with a competitor. The lower the illusorily instated self-percepts of physical efficacy, the weaker is the competitive endurance in new physical activities. Simultaneous competition, which renders comparative ability appraisals especially salient, yields a higher relationship between self-percepts and performance than does successive competition. Even the mere sight of a formidable-looking opponent instills lower self-percepts of efficacy than does an adversary who looks less impressive. As might be expected, preexisting self-percepts of efficacy have greatest impact on initial competitive performance, whereas socially induced self-percepts affect the subsequent course of competitive endurance (Weinberg, Gould, Yukelson, & Jackson, 1981).

The power of self-efficacy belief over brawn is underscored further by evidence that self-percepts of physical efficacy illusorily boosted in females and illusorily diminished in males obliterate large preexisting sex differences in physical strength (Weinberg et al., 1979). In field studies, perceived self-efficaciousness is accompanied by high athletic performances in such diverse sports as track (Morelli & Martin, 1982), tennis (Barling & Abel, 1983), diving (Feltz, 1982), and gymnastics (Lee, 1982).

CONVERGENT EVIDENCE FROM DIVERGENT DOMAINS AND PROCEDURES

In the diverse lines of research on self-referent thought, people's judgments of their self-efficacy explain and predict their level of psychological functioning across different methods for altering self-percepts of efficacy, different ways of assessing perceived self-efficacy, different indices for gauging the relationship between self-percepts of efficacy and action, varying temporal intervals, dissimilar settings, diverse subject populations, different modalities of reactivity, and heterogeneous domains of psychological functioning. Moreover, self-percepts of efficacy account not only for variations in level of affective and performance changes produced by different modes of influence, but also for variations in perfor-

mance between persons receiving the same mode of influence, and even variations within individuals about particular tasks they are likely to master or fail. Convergent evidence from divergent domains and procedures lends broad support to the notion that perceived self-efficacy operates as an influential mechanism in human agency.

Different causal paradigms have been used to address the issue of causality. They include, raising perceived self-efficacy to differential levels by conveying information about coping strategies (Bandura, Resse, & Adams, 1982), selecting different levels of ability but varying perceived self-efficacy within each ability level (Collins, 1982), altering the level of perceived self-efficacy by judgmental heuristics that convey no relevant information (Cervone & Peake, 1984), and applying a procedure that would ordinarily exacerbate a condition but in ways that raise perceived self-efficacy (Holroyd & Penzien, 1982). Results of these diverse approaches similarly provide convergent evidence that perceptions of personal efficacy contribute to level of psychological functioning.

Although self-efficacy judgments are functionally related to action, numerous factors can affect the strength of the relationship. Discrepancies may arise because of misjudgment of task requirements, unforeseen situational constraints on action, inadequate tools and resources for optimal execution of skills, deficient performance information so that self-percepts of efficacy are not translated to appropriate magnitudes of effort, disincentives to act upon one's self-percepts of efficacy, ill-defined global measures of perceived self-efficacy or inadequate assessments of performance, and new experiences that occasion reappraisals of self-efficacy in the time elapsing between probes of self-efficacy and action. Examining sources of discordance between perceived self-efficacy and action, as well as the processes whereby self-efficacy influences affect and action, will deepen understanding of how self-referent thought affects human functioning.

SELF-EFFICACY AS ONE OF SEVERAL MECHANISMS OF PERSONAL AGENCY

People's perceptions of their efficacy touch, at least to some extent, most everything they do. To say that perceived self-efficacy operates as a common mechanism in personal change does not mean that other mechanisms do not also come into play in promoting change. Neither personal agency nor quality of human functioning rests solely on perceived self-efficacy. Marzillier and Eastman (1984) seem to be mistaking the issue of *commonality* of mechanism with *exclusivity* of mechanism. The con-

vergent evidence cited earlier from differing lines of research attests to the commonality of the self-efficacy mechanism in psychological change.

One must distinguish between research designed to clarify particular mechanisms governing behavior and studies aimed at maximizing the amount of variance explained in behavior by combining a host of factors that contribute to it. Eastman and Marzillier need not fear that perceived self-efficacy will usurp the lion's share of the variance in human conduct. Because behavior is multiply determined, any single factor leaves a fair amount of variance unaccounted for. Indeed, in the social learning view (Bandura, 1977b), human behavior is governed by multiform determinants operating through varied mechanisms. Since explanatory and predictive power is unlikely to go out of vogue in a scientific enterprise, perceived self-efficacy should enjoy an influential membership among the mechanisms of human agency.

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