

## CHAPTER 2

# Action Phases and Mind-Sets

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The focus of this chapter is on the course of action, which is understood to be a temporal, horizontal path starting with a person's desires and ending with the evaluation of the achieved action outcome. The phenomena of choosing an action goal, initiating the appropriate actions, and executing these actions are assumed to be situated in between. This comprehensive perspective conceives of the course of action as a number of consecutive, distinct segments or phases. It raises questions concerning how people *choose* action goals, *plan* and *enact* their execution, and *evaluate* their efforts. The concept of "mind-set" is employed to find answers to these questions in terms of the cognitive processes or orientations that allow for easy completion of the different action phases.

### A PHASE MODEL OF ACTION

#### Goal Setting and Goal Striving

"Being motivated" implies a number of different phenomena. But how many distinct aspects of being motivated to pursue a desired goal are there? Kurt Lewin (Lewin, Dembo, Festinger, & Sears, 1944) made a major distinction between goal striving and goal setting. "Goal striving" is behavior directed toward existing goals, and thus addresses questions of moving toward the chosen goal. "Goal setting," on the other hand, addresses the question of what goals a person will choose, and thus considers the expected value of the available choice options. Noticing the unique nature of both of these problems, Lewin adopted a distinct theoretical perspective for each of them. He referred to an expectancy  $\times$  value model when goal setting was at issue—for instance, when he and his colleagues were attempting to explain people's changes in aspiration level (Lewin et al., 1944). Issues of goal striving, however, were explained in terms of his theory of tension systems (Lewin, 1926), through which he tried to discover the forces that move a person toward a chosen goal. Lewin considered the strength of these forces to be related not only to the valence of the chosen goal, but also to the individual's perceived distance from the goal. By introducing the variable of

potency, Lewin (1936) tried to explain which of the many goals people entertain at a given time actually guide their behavior in specific situations.

German researchers studying goal-oriented behavior before Lewin devoted themselves solely to the issue of goal striving by studying the initiation and execution of actions serving chosen goals or instructions given by others. This research tradition has become known as the German "will psychology"; its most prominent figure was Narziss Ach (1905, 1910, 1935). Researchers in this tradition fiercely disagreed on the key questions of will psychology, such as whether intentions specifying an appropriate opportunity to act favor smooth action initiation, regardless of the importance of the respective superordinate goal (Ach, 1935; Selz, 1910). Nevertheless, they unanimously considered goal striving to be different from goal setting, which they referred to as the "battle of motives." For German will psychologists, it was clear that people's goal setting depends primarily on their desires, needs, and interests, whereas a host of additional variables determines whether and how people act on their chosen goals. It was the latter that they tried to identify and that they explored in their theories.

Researchers studying goal-oriented behavior after Lewin shifted their attention from goal striving to goal setting. Stimulated by Lewin's as well as Festinger's work on shifts in the level of aspiration (Festinger, 1942; Lewin et al., 1944), Atkinson (1957) presented a formal model of risk taking that made it possible to compute the motivational tendency to choose tasks representing various difficulty levels. Like Lewin, Atkinson considered goal setting and goal striving to be the two major problems requiring solution in any psychology of motivation:

The first problem is to account for an individual's selection of one path of action among a set of possible alternatives. The second problem is to account for the amplitude of the action tendency once it is initiated, and for its tendency to persist for a time in a given situation. (1957, p. 359)

However, Atkinson hoped that the two distinct problems could be reduced to one and thereby could be accounted for by a single theoretical model. In his view, the theory best suited to accomplish this purpose was the risk-taking model (Atkinson, 1957) or a modified version of it (Atkinson & Reitman, 1956). This model implies that the motivational tendency that makes a person choose a certain task will also account for the effort the person exerts when working on the chosen task and for the quality of the achieved performance.

Empirical studies investigating this implication sometimes observed the predicted performance-enhancing effects of motivation, but more often failed to do so (see Atkinson, 1974, for a review). Atkinson attributed the "now you see it, now you don't" character of this effect to what he called "overmotivation" (and its opposite, "undermotivation"). Referring to the Yerkes-Dodson law (Yerkes & Dodson, 1908), he postulated that there should be an ideal motivational tendency for each individual task. Tasks differ with respect to the amount of motivation that leads to most efficient performance: Low levels of motivation are more

appropriate for some tasks, whereas medium or high levels are more appropriate for others. Since which tasks belong to which category was unknown, Atkinson suggested establishing this classification empirically. Once it was known what level of motivation is ideal for a given task, researchers would finally be able to develop valid predictions of task performance, based solely on their knowledge of the individual's motivation.

As compared to this empirical Sisyphus-like work, a more theoretical solution to the troublesome motivation–performance issue certainly exists. That is, one can re-establish the old distinction between goal setting and goal striving. Eric Klinger (1977) recognized this possibility when he introduced his concept of “current concerns.” He pointed out (1977, pp. 22–24, 329–330) that expectancy  $\times$  value theories have been only very modestly successful in predicting vital aspects of goal striving, such as work effort and quality of performance. Consequently, his theory of current concerns focuses solely on issues of goal striving. This theory has no difficulties in accounting for the commonly observed invigoration of activity in the face of obstacles en route to a chosen goal—a phenomenon that cannot be explained by expectancy–value theories, because the setback must be assumed to reduce the expectancy of achieving the goal and thus the individual's motivation to work for it.

Kuhl (1983) also re-established the classic distinction by introducing the concepts of “choice motivation” and “control motivation.” In his opinion, models of choice motivation relate to goal setting, and he saw Atkinson's risk-taking model and its many reformulations and extensions (e.g., Feather, 1967; Heckhausen, 1977; Raynor, 1969; Weiner, 1974) as more or less valid examples of such models. Kuhl noted a lack of theories on goal striving and offered his own model, which he labeled “control theory” (Kuhl, 1984). Stimulated by Atkinson and Birch's (1970) assumption that a person is always affected by numerous motivational tendencies, all in constant flux, Kuhl saw effective goal striving as dependent on people's efforts to shield it from competing action tendencies. Accordingly, whether people make progress with respect to a chosen goal is no longer seen as dependent only on the motivation that originally made them choose this goal. Rather, it is also a question of how successfully people shield (control) the actions that lead to goal achievement.

### **The Rubicon Model of Action Phases**

The “Rubicon model” of action phases (Heckhausen, 1987b; Heckhausen & Gollwitzer, 1986, 1987) goes beyond the useful conceptual distinction between goal setting and goal striving. Although the model keeps these two problems of goal-oriented behavior separate, it encompasses both within a single theoretical model, thus permitting them to be analyzed in relation to each other. Furthermore, it provides a temporal perspective that begins with the awakening of a person's wishes prior to goal setting and continues through the evaluative thoughts entertained after goal striving has ended.

Separating the sequence of events occurring within this comprehensive time frame into discrete phenomena, the model posits four distinct phases: first, the predecisional phase; second, the postdecisional but still preactional phase; third, the actional phase; and last, the postactional phase. These phases are separated by three clear boundaries or transition points: the making of a decision, the initiation of respective actions, and the conclusion of these actions. But what distinct phenomena are associated with each phase?

### *Predecisional Action Phase*

The first phase is characterized by wishing and deliberating. People's motives (McClelland, 1980) produce certain wishes: For instance, a person with a strong power motive and a weak affiliation motive is expected to experience more wishes related to power than to affiliation. However, people cannot act on all of their wishes but must choose among them, because some wishes may contradict each other, others are too difficult to implement, and life is simply too short to follow all of one's wishes. People have to deliberate over which of their many wishes they prefer to pursue.

How can people establish such preferences? They may employ the criteria of feasibility and desirability. With respect to feasibility, people may contemplate whether they can obtain the outcome implied by a given wish through their own activity and whether the situational context they face is facilitating or impeding. Accordingly, they should also become concerned with questions such as whether they will find enough time to strive for the desired outcomes and whether the necessary means or opportunities will be available.

The desirability of the wanted outcome is determined by reflecting on its expected value. The expected value is derived by estimating the pleasantness-unpleasantness of potential short-term and long-term consequences and by assessing the probability that achieving the desired outcome will lead to these consequences. Such consequences include the following: a positive or negative self-evaluation, a positive or negative evaluation by significant others, progress toward some important life goal, or some pleasant or unpleasant side effects unrelated to the specific wish that initially started the person's striving (Heckhausen, 1977). In addition, incentives associated with the process of achieving the desired outcome (e.g., joy experienced while trying to establish the desired outcome) should also be relevant when the desirability of a given wish is deliberated.

Proper assessment of the feasibility and desirability of a given wish, however, requires that this wish be seen in relation to other wishes. A wish associated with many attractive consequences may suddenly appear less desirable when scrutinized in the light of a superordinate wish (e.g., the wish to dine in fine restaurants becomes less desirable when it conflicts with the wish to buy a house). Or it might become more feasible when contemplated in connection with the realization of other wishes (e.g., a busy person's wish to learn to play tennis may appear more feasible when it is contemplated together with the wish to take an extended vacation).

### *Making a Decision and the Preactional Phase*

Even when a wish is accorded high desirability and feasibility and thus is given highest preference, the model of action phases assumes that wish fulfillment further demands transforming the wish into an intention. Phenomenologically, this transformation is characterized as a resolution resulting in a feeling of determination to fulfill the wish (or at least a feeling of assurance that one will act on the wish at hand; Michotte & Prüm, 1910). The goal state or desired outcome specified by the wish thus becomes an end state that the individual feels committed to achieve. The model describes this sense of obligation in stating that the individual has acquired a "goal intention." To catch the flavor of this transition from the fluid state of deliberation to a firm sense of commitment, Heckhausen (1987b) employed the metaphor of "crossing the Rubicon."

After forming a goal intention, people move to the preactional phase. The phenomenon associated with this action phase is planning. Planning is often necessary because newly formed goal intentions cannot be implemented immediately if the individual is engaged in alternative activities that first need to be completed or if relevant opportunities to act are not yet available. In addition, most goal intentions specify goal states (e.g., to graduate from college) that cannot be achieved in a single step. Consequently, the individual is interrupted (or must pause) repeatedly and is forced to await future opportunities to work towards this goal.

The model of action phases assumes that people do *not* use these time breaks or pauses to weigh the positive or negative consequences of goal achievement; rather, the feeling of obligation associated with the goal intention makes people concerned with the issue of how to promote achieving the chosen goal. Accordingly, they should address questions of *when* and *where* to start acting, *how* to act, and *how long* to act. Whenever people anticipate difficulties with respect to any of these implementational issues, they should commit themselves to one of the many possible ways of initiating, executing, and terminating a relevant course of action.

Committing oneself to a particular implementational course constitutes forming behavioral intentions. These behavioral intentions (i.e., initiation intentions, execution intentions, and termination intentions) focus on a person's behavior in pursuing the chosen goal. The model distinguishes behavioral intentions from goal intentions, since the latter focus on desired goal states. In line with the ideas of German will psychology (Ach, 1935), it is assumed that behavioral intentions promote the smooth initiation, execution, and termination of activities in pursuing a person's goal intentions.

### *Action Initiation and the Actional Phase*

When does a goal intention lead to initiating relevant actions? It primarily depends on the goal intention's volitional strength—that is, how strongly a person is committed to implementing the chosen goal. The genuine amount of volitional strength is considered to be a positive function of the goal's desirability and feasibility as perceived prior to choosing this goal. However, this volitional

strength may vary, depending on a person's experiences with attempting to initiate relevant actions. If a person repeatedly ignores good opportunities to initiate relevant actions, volitional strength may decrease over time. On the other hand, volitional strength may spontaneously and momentarily increase when the individual encounters obstacles.

More importantly, goal intentions and their effects on the initiation of relevant actions cannot be discussed without considering that many different goal intentions may compete for implementation at any given point in time. One would expect that under these circumstances the intention with the comparatively highest volitional strength would prevail. However, the situation at hand may not be equally conducive to implementing all of these competing intentions; it may favor implementing some of these intentions more than others. In addition, for some intentions the situation at hand may be better suited for smooth implementation than any future situation for which the individual hopes. Consequently, the individual may be very eager to take the opportunity at hand and to postpone the implementation of competing intentions, even if these intentions are associated with comparatively higher volitional strength.

To summarize: Whether a given goal intention leads to the initiation of relevant actions depends on its volitional strength (as compared with that of other competing goal intentions) *and* on how favorable the situation is for readily initiating the particular goal intention (as compared with initiating competing goal intentions *and* as compared with relevant future opportunities one hopes to encounter). Finally, a goal intention that has been furnished with initiation intentions during the postdecisional (preactional) phase should have an additional advantage over competing goal intentions, given that the opportunity specified by the initiation intention is present. In this case, the opportunity to act should be more easily recognized and, once recognized, should elicit a special impulse to start acting on it.

Action initiation is the demarcation line signaling the transition to the actional phase. The phenomenon characteristic of this phase is acting toward goal achievement. A person's efforts to pursue a goal intention are again assumed to be related to the goal intention's volitional strength. The amount of volitional strength serves as a kind of threshold value for the individual's effort exertion. This threshold, however, may be spontaneously moved upward if hindrances are encountered, thus allowing for a reactive, momentary increase in volitional strength. Spontaneous nonconscious increases in effort exertion were originally reported by German will psychologists (Ach, 1935; Hillgruber, 1912), who interpreted these reactive responses of the individual as attempts to hold on to one's goal commitment. These ideas should *not* be confused with considerations expressed by models of effort calculation. For example, Brehm, Wright, Solomon, Silka, and Greenberg (1983), Kukla (1972), and Meyer (1973) specified how the reflective appraisal of perceived ability, perceived difficulty, and subjective value of goal attainment determine a person's effort exertion.

Heckhausen (1987a) assumed that the course of action is directed by the mental representation of the goal, and that determination to achieve a goal

originates from the mental goal representation even when the goal itself is outside of conscious awareness. The goal may be defined at various levels of abstraction (i.e., at the lowest level to the intricacies of the actions to be executed, at an intermediate level to the intended outcome, and at the highest level to the consequences that this outcome is expected to mediate), depending on the difficulties the person encounters when acting on it. In line with Vallacher and Wegner's (1987) action identification theory, goals are assumed to be defined on low levels of abstraction (i.e., necessary implementational steps as compared to the intended outcome and its desired consequences) when smooth goal pursuit is thwarted.

### *Goal Achievement and the Postactional Phase*

The phenomenon associated with the final action phase is evaluating the question of whether one's goal striving has succeeded. What criteria govern this evaluation? Two successive evaluative questions must be answered by the individual. First is the question of whether the intended outcome has been achieved, so that the individual may stop acting and await the desired consequences. This question is easily answered whenever the outcome is a discrete performance (e.g., to send a birthday gift to a friend). It becomes a problem difficult to solve and full of uncertainty whenever the intended outcome can be continuously improved or extended (e.g., to prepare well for a mathematics test). In the latter case, the individual may resort to termination intentions (e.g., "I will work through the practice examples twice" or "I will stop when I succeed in solving every other practice problem"), thus defining clear standards regarding when the intended outcome is achieved.

Second, the individual must address the question of whether the actual value of the goal striving matches its expected value. This implies that the individual must wait for the desired consequences of the achieved outcome before this question can be answered. Only then will the individual be in a position to compare the actual value with the desired value, regardless of whether the desired consequences are a positive self-evaluation, positive evaluation by others, progress toward some superordinate goal, or some pleasant side effects. In reality, the actual value may not measure up to the expected value as assessed during predecisional deliberation. The desirability of the goal may have been overestimated because certain negative consequences were neglected or underestimated, whereas positive consequences were overestimated. Future predecisional deliberation should benefit from such evaluations; that is, the estimation of expected values should become more accurate. In this sense, postactional individuals look not only back into the past, but also to the future.

Postactional evaluation may not only benefit future deliberation, but may also help a person's future planning. Whenever the individual recognizes that the achieved outcome does not meet the intended standards or that the achieved outcome is not good enough to lead to the desired consequences, the individual may furnish the goal intention with new initiation and execution intentions, thus improving the chances of successful implementation. Or the person may lower

the standards related to the quality of the outcome or the attractiveness of its consequences. If such measures are not taken or if all of these efforts fail, the goal intention may linger on without successful implementation. Whenever a situation is encountered that could be perceived as conducive to implementing the goal intention, it still should become activated, although chances to implement it are rather slim. Since this activation occupies cognitive capacity, it may even hinder the implementation of competing goal intentions, thus turning the individual into a procrastinator who keeps failing to act on his or her intentions.

### *Summary and Discussion*

The Rubicon model of action phases takes a comprehensive temporal (horizontal) perspective on the course of action, and thus differs from most current models of action. The latter are of a strict vertical, hierarchical nature (e.g., Carver & Scheier, 1981; Gallistel, 1980, 1985; Hacker, 1985; Semmer & Frese, 1985); they assume that the individual, when executing a course of action, advances from a concern with abstract, superordinate, higher-level goals to concrete, subordinate, lower-level goals. The temporal dimension of action is addressed solely with respect to the organization of single acts or action units within the course of action (von Cranach, 1982).

The horizontal perspective as suggested by the model of action phases has so far not been very popular in psychology. The German philosopher and psychologist Christoph Sigwart (1889) introduced this perspective prior to the heyday of will psychology. Although his work did not stimulate any systematic research, it at least prevented German will psychologists from confounding problems of goal setting (which they referred to as problems of motivation) with goal striving (which they referred to as problems of willing or volition). Recently, Heckhausen and Kuhl (1985) employed a horizontal perspective when they reflected on the long way from a person's wishes to the execution of relevant actions. Although their primary focus was on the mental examinations that wishes must pass before winning access to a person's behavior, they made a strong distinction between pre- and postintentional processes, which they also referred to as motivational and volitional processes, respectively.

The Rubicon model of action phases incorporates this distinction; however, instead of focusing on a person's mental efforts (or blocks) in turning a wish into relevant action, it attempts to delineate distinct phenomena of goal-oriented behavior whose functioning obeys distinct principles. In temporal order, these phenomena are deliberating, planning, acting, and evaluating. The Rubicon model may lead to a number of misconceptions if taken too literally. These misconceptions are as follows:

1. The model does *not* imply that every single initiation of action is directly preceded by deliberation of the desirability and feasibility of the underlying goal and the forming of a goal intention. Many initiations of action are simply resumptions of activities that were started some time before; forming the underlying goal intention anew is therefore unnecessary. The same is true for action initiations postponed because of a lack of opportunities to act. Finally, people



entertain goal intentions that imply superordinate, identity-related goals, such as becoming a psychologist. These identity intentions (Gollwitzer, 1987) lead to initiating relevant actions without prior reflection on the desirability and feasibility of the underlying goal; the individual needs only to check whether a given opportunity is conducive to pursuing this goal.

2. The model does *not* imply that forming a goal intention is necessarily followed by intense planning concerning where, when, how, and how long to implement the chosen goal. It is rather assumed that such concerns originate *only* when smooth implementation of the goal intention is threatened. Initiation may be cumbersome (a) whenever special circumstances or means are required that still need to be developed or created; (b) whenever the critical opportunity may be missed because it is difficult to recognize, happens infrequently, or presents itself only for a short moment; and (c) when competing goal intentions continue to block implementing the critical goal intention. Execution is hampered when the course of action runs into difficulties because the individual does not possess the necessary competencies or fails to focus attention on the goal pursuit when conscious control of the activity is needed. Finally, termination of the implementational activities becomes problematic whenever it is unclear exactly what suffices as the intended outcome. In all of these cases pertaining to the initiation, execution, and termination of implementational actions, planning that results in the formation of the respective behavioral intentions is to be expected.

3. The model of action phases does *not* exclude the possibility of overlap between action phases. In the predecisional phase, deliberation of wishes concerning a goal can easily be interrupted so that actions in the service of other already chosen goals may be planned, initiated, completed, or evaluated. Also, in the postdecisional (preactional) phase, the individual may deliberate various wishes and evaluate some completed goal pursuit while waiting for the opportunity to act on a chosen goal; the individual may even act on some other goal when these actions do not demand much cognitive capacity (i.e., when they are automatized). Similarly, during the execution of goal-related actions, individuals may deliberate wishes, ready themselves for implementing other goals, or evaluate some terminated goal pursuit as long as executing the critical actions is largely automatized.

4. The model of action phases does *not* ignore the fact that goal striving is hierarchically organized. This is most evident in the model's distinction between goal intentions and behavioral intentions. Behavioral intentions are supplements to goal intentions and serve to promote the implementation of goal intentions. Accordingly, the formation of a goal intention precedes the formation of behavioral intentions, and the latter are justified by the former. But not all of the intentions formed subordinately to some goal intention must be behavioral intentions. People frequently form goal intentions in the service of other (superordinate) goal intentions (e.g., when a person who has decided to become a psychologist makes up his or her mind to go to school abroad). In this case, the formation of the subordinate goal (i.e., going to school abroad) should be preceded by a concern not only for the feasibility of this goal, but also for its desirability.

5. The model uses the metaphor of crossing the Rubicon to describe forming a goal intention. The allusion is not so much to having gone beyond a point of no return as it is to putting incessant deliberation to a rest. The model assumes that making a goal decision stops the "babble of competing inner voices" (Jones & Gerard, 1967, p. 181). After the decision has been made, but prior to the initiation of actions, no deliberation of the pros and cons relative to the chosen goal is expected to occur; rather, the individual is assumed to explore efficient implementation of the chosen goal (Beckmann & Gollwitzer, 1987).

Still, the model assumes that making a goal decision creates a rather durable commitment to pursue this goal, so that hindrances to one's goal pursuit do not lead to immediate retreat. Rather, the individual is expected to attempt to conquer hindrances by spontaneously increasing effort, employing different means, taking more time to overcome these hindrances, or trying to get around them by taking alternative routes to goal achievement (Gollwitzer & Wicklund, 1985). Obviously, the concept of commitment employed by the Rubicon model of action phases is dissimilar to commitment notions that link commitment to the execution of action, as conceived by dissonance researchers (Brehm & Cohen, 1962; Wicklund & Brehm, 1976), and also by Brockner and Rubin (1985), Farrell and Rusbult (1981), Kiesler (1971), and Salancik (1977). Since behavior is less revocable than thoughts (Jones & Gerard, 1967), the latter conceptualization furnishes commitment with a point-of-no-return quality. Contrary to this approach, the action phases model conceptualizes commitment in terms of an obligation to a goal, as portrayed in research on maintaining relationships (Kanter, 1972; Kelley, 1983; Lund, 1985; Rosenblatt, 1977), on identification with an organization (Buchanan, 1974; Mowday, Porter, & Steers, 1982; O'Reilly & Chatman, 1986), and on self-defining goals (Wicklund & Gollwitzer, 1982) or personal strivings (Emmons, 1989).

At the core of the Rubicon model of action phases is the assumption that the realm of goal-oriented behavior comprises various phenomena (deliberating, planning, acting, evaluating) that are ruled by different principles. But how is it possible to specify these principles so that one may test postulated differences? In the next section, I show that employing the concept of mind-set provides an interesting solution to this problem.

## **THE CONCEPT OF MIND-SET**

If we assume that the phenomena associated with each phase of the Rubicon model are efforts at solving distinct tasks, we may try to specify the tasks to be solved at each of the four phases of the model. In the predecisional phase, the person's task is to make the best possible choice between potential action goals, whereas in the postdecisional (preactional) phase the task is to promote the initiation of actions that imply moving toward the chosen goal. In the actional phase the person faces the task of efficiently executing such actions, whereas the task in the postactional phase may best be described as trying to determine

whether the intended outcome and its desired consequences actually accrued. We may further assume that involvement in these tasks creates a congruent “mind-set”—that is, a phase-typical cognitive orientation that promotes task completion (Gollwitzer, 1990). This implies that analyzing the task demands of each action phase should lead to hypotheses about the unique qualities of the respective mind-set. Before this analysis is attempted, however, a historical review of the concept of mind-set is presented.

### Historical Background

In 1904 Oskar Külpe, the founder of the Würzburg school (see Boring, 1950, pp. 401–406; Gibson, 1941; Humphrey, 1951, pp. 30–131), reported his experiments on what he called “abstraction.” Subjects viewed pictures of four nonsense syllables, each written in a different color. The letters composing the syllables, the positioning of the colors, and syllables themselves were varied over trials. Most importantly, Külpe also varied instructions prior to each picture presentation. Subjects had to attend to a particular aspect of the stimulus display (e.g., the frequency of a certain letter, the positioning of the colors, the figure represented by the positioning of the syllables, or the kind of letters composing the syllables). Immediately after each stimulus presentation, lasting 0.125 second, he requested the subjects to report the solutions to the tasks; in addition, he asked them to recall the other aspects of the stimulus display, of which they had not been instructed to take notice. The results showed drastic effects of instruction: Whenever the experimenter’s questions were related to the instructions prior to viewing the display (e.g., subjects were asked to attend to the positioning of the colors and then asked to recall it), subjects were highly accurate in their answers; however, whenever there was a mismatch (e.g., subjects were asked to attend to the positioning of the colors but had to report on the different letters composing the four different syllables), subjects were extremely inaccurate.

In a very similar experiment, Chapman (1932) observed comparatively more accurate reports when the instructions given prior to stimulus presentation matched the inquiry posed after stimulus presentation. Watt (1905), another representative of the Würzburg school of thought, used particular words to talk about such effects, speaking of the instructions prior to stimulus presentation as constituting an *Aufgabe* (task), which creates in the individual who accepts it a corresponding *Einstellung* (mind-set). This mind-set in turn should “prepare” the individual so that the stimulus material presented should be analyzed efficiently, resulting in proper task completion.

### Mind-Sets Related to Action Phases

In earlier papers stimulated by the Rubicon model of action phases, two distinct mind-sets or states of mind were postulated (Gollwitzer, 1987; Heckhausen, 1987b; Heckhausen & Gollwitzer, 1986, 1987). The predecisional and postactional phases were seen as being similar, because in both phases the desirability

and feasibility of a goal are at issue. Because this issue is the master theme of the modern psychology of motivation (Atkinson, 1964), we referred to these action phases and the associated mind-sets as "motivational." Likewise, the postdecisional (preactional) phase and the actional phase were seen as being similar, since in both phases implementing the chosen goal is at issue. Because this was the master theme of will psychology, these action phases and the associated mindsets were referred to as "volitional." Moreover, the motivational mind-set was said to be characterized by a so-called "reality orientation"—that is, an orientation toward processing available information in a nonselective, unbiased manner. On the other hand, the volitional mind-set was said to be characterized by a so-called "realization orientation"—that is, an orientation toward processing available information in a selective manner biased in favor of attaining the chosen goal.

This original conceptualization, however, created confusion. For instance, it can be argued (Kornadt, 1988) that not only predecisional but also postactional individuals try to achieve (realize) something—namely, to make proper decisions or to develop correct evaluations, respectively. Therefore, realization orientation should also be present in the latter action phases. Similarly, people in the process of planning or executing an intricate course of action have to scrutinize available situational information rather realistically, and thus should also evidence a strong reality orientation.

This original conceptualization also failed to exploit the theoretical power of the concept of mind-set. Applying the mind-set concept to the action phases, first of all, requires critically analyzing the tasks individuals set for themselves in the various action phases. Second, having discovered the characteristic task demands, one is finally in a position to form hypotheses about the unique cognitive orientation of the respective mind-sets. Our original conceptualization discouraged this approach because it lumped the predecisional and the postactional phases together, banning the idea that different tasks are solved in these action phases. The same was done with the postdecisional (preactional) phase and the actional phase. Moreover, the characterization of the cognitive characteristics of the delineated mind-sets was either extremely general (reality orientation) or did not even relate to a cognitive orientation, but rather to the task expected to elicit the mind-set (realization orientation). In the following discussion, our original conceptualization is abandoned. Instead, an analysis of the tasks to be solved at each action phase is presented. As a result, four distinct mind-sets (i.e., the deliberative, implemental, actional, and evaluative mind-sets) are postulated, and their distinctive cognitive orientations are spelled out.

### *Deliberative Mind-Sets*

When reflecting on the task to be solved in the predecisional phase, one has to keep in mind that predecisional individuals deliberate in order to determine which of their wishes are not only most desirable but also feasible. Solving this task requires that an individual be primarily concerned with information relevant to the positivity–negativity of the expected consequences of a given wish's out-

come in order to estimate its desirability. In addition, information that allows the individual to assess the chances of achieving this outcome seems crucial in determining its feasibility. Reliable estimates should be favored when *all* of the relevant information for assessing desirability and feasibility is discovered and processed. Since it is unclear at the outset which pieces of information or knowledge may be relevant to assessing desirability and feasibility, a general open-mindedness toward processing incoming or stored information seems beneficial. Finally, being concerned with information that addresses (or potentially addresses) the desirability of the wish under scrutiny will not do much good if deliberation is not conducted in an impartial manner. Ignoring negative consequences or overemphasizing positive consequences may make the deliberated wish appear more desirable than is actually justified. Similarly, if information pertaining to the feasibility of the wish under scrutiny is not analyzed in a manner that favors accurate assessments, the individual may overestimate his or her capabilities to implement the desired wish, and thus may judge its feasibility to be higher than it actually is.

Accordingly, the mind-set that clearly facilitates the task of the predecisional phase (i.e., to choose the most desirable wish that is also feasible) should evidence the following characteristics: First, there should be cognitive tuning toward information relevant to the issues of feasibility and desirability. Second, there should be an orientation toward accurate and impartial processing of such information. And finally, there should be an open-mindedness or heightened receptivity to information in general. This deliberative mind-set should originate whenever people become intensely involved with deliberating their wishes.

### *Implemental Mind-Sets*

The task to be solved by the postdecisional (preactional) individual is planning when, where, and how to act in order to promote action initiation. Solving this task effectively requires the individual to be primarily concerned with information related to these questions. Moreover, task solution is facilitated whenever the individual commits himself or herself to a certain favorable opportunity to act—that is, forms an initiation intention. In this way attention is focused on a specified opportunity to act, and the probability that the individual will forego this opportunity is reduced. However, all of these concerns will fail to benefit action initiation if the individual starts to question the desirability or feasibility of the chosen goal. Accordingly, any such doubts should be countered by the individual's boosting the desirability and feasibility of the chosen goal, thus maintaining persistence in initiating actions to reach the chosen goal.

Therefore, the mind-set that facilitates solving the task of the postdecisional (preactional) phase should evidence the following characteristics: First, there should be cognitive tuning toward information relevant to when, where, and how to act. Second, there should be closed-mindedness in the sense of concentrating on information that helps to promote the chosen goal. And finally, there should be a partial and optimistic analysis of information related to the chosen goal's desira-

bility and feasibility, respectively. This implemental mind-set should originate whenever people become intensely involved with planning the implementation of their goal intentions.

### *Actional Mind-Sets*

The task of the actional phase may be described as acting toward the goal so that goal achievement is promoted. Solving this task requires one to avoid disruptions, because any halting of the flow of action postpones goal achievement. The mind-set that facilitates this should therefore evidence characteristics of what Csikszentmihalyi (1975) called "flow experience" and Wicklund (1986) labeled "dynamic orientation." The individual no longer reflects on the qualities of the goal to be achieved, on his or her capacities to achieve the goal, or on alternative strategies on goal achievement; nor does the individual form behavioral intentions regarding when, where, and how to act. Rather, the individual is completely caught up in the actions currently being executed. Accordingly, only those aspects of the self and the environment that sustain the course of action are attended to, whereas any potentially disruptive aspects (e.g., self-reflective thoughts, competing goal intentions, distractive environmental stimuli) are ignored. Therefore, the mind-set that facilitates the promotion of goal achievement is one of closed-mindedness to information that could trigger a re-evaluation of the goal that is pursued, a re-evaluation of the chosen route toward goal attainment, or any self-evaluation (e.g., "Can I be proud of my performance? Am I suited for this activity?"). Rather, the actional mind-set should evidence cognitive tuning toward internal and external cues that guide the course of action toward goal attainment. It should originate whenever people move effectively toward goal attainment.

### *Evaluative Mind-Sets*

The task to be solved in the postactional phase is evaluating outcomes and consequences of goal striving in order to discover whether the intended outcome has been reached and its desired consequences have been obtained. Solving this task, therefore, requires the individual to be primarily concerned with the quality of the outcome (standards) and the actual desirability of its consequences. Task solution should be facilitated when the individual simply compares what is achieved (outcomes) and obtained (consequences) with what was intended and desired when the goal intention was formed. This comparison should benefit from a correct assessment of the quality of the outcome and an objective, impartial view of the desirability of its consequences.

Accordingly, the mind-set that facilitates the task of evaluation in the postactional phase should evidence the following characteristics: First, there should be cognitive tuning toward information relevant to assessing the quality of the achieved outcome and the desirability of its consequences. Second, there should be an orientation toward accurate and impartial processing of this information. And finally, there should be a comparative orientation; that is, the intended outcome and the desired consequences should be compared with the actual outcome and its consequences. This evaluative mind-set should originate whenever people be-

come intensely involved with evaluating outcomes and consequences of goal striving.

### *Summary*

The various action phases of the Rubicon model differentiate four distinct phenomena of goal-oriented behavior: deliberating, planning, acting, and evaluating. Since each of these phenomena implies solving a distinct task, it is inferred that different mind-sets evolve whenever one is involved in these particular tasks. For each of these distinct mind-sets (i.e., deliberative, implemental, actional, evaluative), the associated cognitive orientation is specified by analyzing concrete task demands.

## **MIND-SETS AND COGNITIVE FUNCTIONING: RECENT FINDINGS**

So far, we have concentrated our empirical efforts on testing the cognitive orientations postulated for the deliberative and implemental mind-sets. Our experiments have focused on three key issues: (1) the postulated cognitive-tuning effects; (2) the distinct way of processing information related to feasibility and desirability; and (3) the postulated differences in open-mindedness.

### **Mind-Sets and Cognitive Tuning**

We hypothesized that both the deliberative and the implemental mind-sets achieve cognitive tuning toward task-congruous information. The deliberative mind-set should lead to cognitive tuning toward information related to the feasibility of the intended outcome (action-outcome expectancy) and to the desirability of the expected consequences (expected value), whereas the implemental mind-set should evoke cognitive tuning toward information related to action initiation (when, where, and how to get started). How does one test these hypotheses? In principle, there are two possible approaches. The first approach focuses on the subjects' thoughts while they are in a deliberative or implemental mind-set; it is expected that congruous thoughts will be experienced more frequently than incongruous thoughts. The second approach focuses on the subjects' readiness to encode or retrieve task-congruous information; here it is expected that congruous information will be encoded and retrieved comparatively more effectively.

### *Thought Sampling*

The first approach led us to conduct three different but related experiments. In the first experiment (Heckhausen & Gollwitzer, 1987, Study 1), experimental subjects chose between two different sets of test material designed to measure creativity, one set consisting of black-and-white pictures and the other set consisting of color pictures. Subjects were told that they would later write a creative story

about whichever set of pictures they chose. The reason given for offering a choice was that some people more easily reach their full creative potential when working with color pictures, whereas others perform better with black-and-white pictures. Subjects were encouraged to avoid snap choices between test materials, but to engage instead in full-fledged deliberation. For this purpose, we had subjects view a series of sample pictures (six black-and-white and six color pictures).

We interrupted one group of subjects 90 seconds after they had viewed the sample pictures (the predecisional group), while still undecided as to which set of test material they wanted to choose. In a thought-sampling task, they were requested to report their thoughts experienced during the 90-second time period, starting with the last sample picture up to the point of interruption. To increase the validity of this self-report, we proceeded as follows: Subjects first were to write down their most recent thought, and then the second most recent thought. Next, the first thought was to be reported, and then everything they had thought of in between. According to Ericsson and Simon (1980), this procedure should produce valid self-reports because subjects can retrieve the most recent thought from short-term memory. Writing down the most recent thought should then facilitate recall of the thoughts experienced immediately before, since these should be connected through episodic associations in long-term memory.

Another group of subjects was not interrupted until a decision had been made and subjects had spent 90 seconds waiting for the test material they had chosen (the postdecisional group). These postdecisional subjects reported their thoughts experienced during the 90-second time period starting with having made a decision up to the point of interruption.

Finally, we employed two groups of control subjects. Both groups were simply assigned a set of test material (yoked with the pre- and postdecisional subjects' choices). One of these groups was interrupted before this assignment (the preassignment group) and the other group afterwards (the postassignment group). The time periods on which control subjects had to focus when reporting their thoughts were closely matched to those of the respective experimental subjects.

Content analysis of subjects' reported thoughts revealed that thoughts related to expected values (e.g., "Being a creative person is important") and thoughts related to action-outcome expectancies (e.g., "I would do better with the color material") were much more frequent in predecisional subjects than in any of the other three groups of subjects. The frequency of implementation-related thoughts (i.e., considerations and expressed intentions about what kind of story would be told and how this should be done) was elevated in both the postdecisional and postassignment groups. However, hardly any implemental thoughts were reported by predecisional and preassignment subjects.

If it is assumed that predecisional subjects engaged in intensive deliberation and thus developed a deliberative mind-set, the observed predominance of task-congruous thoughts in predecisional subjects supports our cognitive-tuning hypothesis. Similarly, because both postdecisional and postassignment subjects were planning to write a creative story on the test material, both of these groups of



subjects should have developed an implemental mind-set. Observing comparatively more implemental thoughts in these two groups again supports our hypothesis of task-congruous cognitive tuning.

### *Distance from Making a Change Decision*

One could argue that the findings described above are rather trivial, because subjects simply entertained those thoughts that they were told to entertain. One has to remember, however, that we did not tell predecisional subjects to think of issues related to action–outcome expectancies and expected values; nor did we tell postdecisional subjects to stop thinking about such issues and to turn their attention to implementational issues instead. A still more convincing test of the cognitive-tuning hypothesis may be performed if the independent and dependent variables are exchanged—that is, if one asks people who harbor a personal, unresolved problem pending a change decision to engage in exactly those mental activities hypothesized to be associated with a deliberative mind-set. If our hypothesis of mind-set-congruous cognitive tuning is correct, one should expect these subjects to become lost in deliberation and therefore to feel predecisional—that is, far from making a change decision. But if such people are asked to engage in mental activities that we believe to be associated with an implemental mind-set, they should become intensely involved in the postdecisional task of planning the implementation of the change decision not yet made. Consequently, they should feel postdecisional and thus closer to making a change decision.

To test these ideas, the following experiment was conducted (Gollwitzer, Heckhausen, & Ratajczak, 1990). Subjects first named an unresolved personal problem that was pending a change decision. They named problems such as “Should I move away from home?” “Should I switch my major?” or “Should I break up with my boyfriend?” In order to measure subjects’ perceived distance from making a change decision, we asked subjects at the outset of the experiment how determined they felt at that very moment, how much resolution it would still take them to arrive at a change decision, and how far away they felt from the act of making a change decision. Next, one group of subjects (the deliberation group) was asked to estimate the expected value of making the change decision. They listed the potential immediate consequences and the delayed positive and negative consequences, and they estimated the probability of these consequences’ occurring. In addition, they assessed the chances of achieving the respective outcomes. Another group of subjects (the implementation group) was asked to plan the implementation of the not-yet-made change decision by listing a number of different activities that could serve the purpose of implementing it. Subjects then had to decide on a course of action and to imagine themselves executing this plan.

When subjects were asked again about their perceived distance from a change decision (employing the three items listed above), deliberation subjects continued to describe themselves as undetermined and irresolute—that is, far from making a change decision. Implementation subjects, however, indicated an increase in determination and resolution—that is, perceived themselves as closer to making a change decision. An analysis of the potential mediators of this effect

ruled out an increase in desirability or feasibility, but instead pointed to having committed oneself to a certain implementational plan as the critical variable. In other words, forming behavioral intentions most strongly contributed to approaching the change decision.

In summarizing the two studies reported thus far, I would like to point out the following: Predecisional subjects showed comparatively more thoughts related to action–outcome expectancies and expected values, and when (undecided) people were made to entertain such thoughts, they felt strongly predecisional. Postdecisional subjects, on the other hand, showed comparatively more implemental thoughts, and when (undecided) people were made to entertain such thoughts they felt less predecisional—that is, closer to the act of decision. These findings suggest that a deliberative mind-set produces cognitive tuning toward thoughts related to action–outcome expectancies and expected values, whereas the implemental mind-set tunes one toward issues of how to achieve a chosen goal.

### *Writing Fairy Tales*

The most convincing demonstration that deliberative and implemental mind-sets entail congruous thought production is provided by the findings of the following experiment (Gollwitzer, Heckhausen, & Steller, 1989, Study 1). First, subjects were placed either into a deliberative or an implemental mind-set by being asked to deliberate an unresolved personal problem pending a change decision or to plan a personal project pending realization, respectively. Again, subjects were allowed to work on personal problems or projects of their choice; career-related, lifestyle-related, and interpersonal issues were named with approximately equal frequency. The deliberative mind-set group received the same instructions as described above in the distance-from-a-change-decision experiment. Subjects in the implemental mind-set group were instructed to list five implementational steps required to complete the intended project they had named. For each of these steps, subjects had to commit themselves as to when, where, and how they planned to execute it. The control group did not receive any mind-set manipulation.

In the second part of the experiment, subjects were presented with the beginnings of three different fairy tales and were asked to continue these tales with three sentences each. All of these tales ended at a point where the main character of the story faced a goal decision. In the first story, for example, a widowed king faced the choice of going to war or staying at home to protect his beloved daughter. The sentences were scored on the basis of whether deliberative or implementational efforts were imputed to the king: Any verbs relating to the king were classified according to whether the king was engaged in the predecisional task of choosing between goals or the postdecisional task of implementing a chosen goal. The phrase “The king racked his brain wondering what to do,” for instance, was scored as imputing a deliberative effort to the king, whereas the phrase “The king ordered a trusted officer to stay at home at the castle and protect his daughter” was scored as imputing an implementational effort.

As expected, subjects' mind-sets affected their flow of creative thought when completing their fairy tales. Deliberative mind-set subjects imputed more deliberative efforts to the king than implemental mind-set subjects, with control subjects' imputations falling between those of the other two groups. An analogous congruency effect was observed with imputing implementational efforts. The implemental mind-set group scored higher than the deliberative mind-set group, and the control group again scored in between these two groups.

Telling fairy tales follows a certain story grammar (Rabkin 1979; Rumelhart, 1975, 1977): Only when a solution is found to the problem introduced at the beginning may the story come to an end. Since these solutions come about more easily if the main character takes action, ascribing implementational efforts to the king should have been the more common response. This was actually the case in the control group: Subjects imputed about 10 times as many implementational efforts as deliberative efforts to the king. However, although telling a fairy tale strongly favors producing implementational thoughts, the deliberative mind-set weakened this preorientation and the implemental mind-set strengthened it. It seems important to note that these mind-sets had been elicited when subjects meditated on quite different issues (i.e., unresolved personal problems or intended projects related to career, lifestyle, or interpersonal issues), and that some minutes had passed before subjects proceeded with the fairy tales.

### *Cued Recall of Mind-Set-Congruous Information*

Deliberative and implemental mind-sets not only should make congruous thoughts more readily available, but also should allow for more effective processing of congruous information. That is, people operating within a deliberative mind-set should be particularly effective in processing information related to outcome expectancy and expected value, whereas people operating within an implemental mind-set should be more adept at processing information related to when, where, and how to act on a chosen goal. Demonstrating potent mind-sets implies, in addition, that this prediction should hold true not only for information relevant to the meditated unresolved problem that has led to the deliberative mind-set, or for information relevant to the planned project that has led to the implemental mind-set. Rather, these mind-sets' cognitive-tuning effects should transfer to unrelated deliberative or implementational information.

To explore this supposition, we asked subjects to view a series of slides (Gollwitzer et al., 1989, Study 2). Each of the eight slides depicted a different person said to be experiencing a personal conflict of the following kind: Should I do X or not? The accompanying slide specified this conflict (e.g., "Should I sell my apartment or not?") and presented thoughts presumably entertained by the person depicted. Two of these thoughts were related to the expected values of the change decision ("It would be good because . . ."; "It would be bad because . . ."), and two were related to the question of how to initiate relevant actions, given that the change decision had been made. One of these latter two was related to the timing of relevant actions ("If I should decide to do it, then I won't . . . before

...”), and the other to the sequencing of relevant actions (“If I should decide to do it, then I will first . . . and then . . .”).

We created deliberative and implemental mind-sets by employing the choice paradigm introduced above (i.e., the first study reported). The choice offered was between materials for a creativity test that required constructing collages from material cut out of newspapers. Two sets of collage segments were said to be available, one set consisting of black-and-white elements and the other of color elements. Subjects were told that people could reach their full creative potential only if they chose the type of material (black-and-white or color) they found personally most appealing.

One group of subjects viewed the slides and had to recall the information depicted on the slides prior to making a decision. Another group received and recalled the information after a decision had been made. If mind-set-congruous information is processed more effectively, predecisional subjects should have recalled information related to expected values better than implemental information, whereas the reverse should have been true for postdecisional subjects. Finally, we employed a group of control subjects who received and recalled the same information without either expecting to make a decision or having made one.

Control subjects' cued-recall performance (the beginnings of the sentences as listed above were provided as recall cues) was the same for expected-value-related information (positive and negative consequences) and the implementation-related information (timing and sequencing of relevant actions). Predecisional subjects, however, did better with expected-value-related information than with implementation-related information, whereas the reverse was true for postdecisional subjects. This pattern of recall performance strongly suggests that mind-set-congruous information is processed more effectively than incongruous information. The present study should not be confused with experiments designed to explore whether there is differential recall of information that is consistent with or contradictory to the decision made (Dellarosa & Bourne, 1984). In the present study, the information provided was not even relevant to the choice to be made, neither supporting nor undermining subjects' decisions.

What kind of memory processes account for the present finding that mind-set-congruous information is recalled comparatively more effectively? If we assume that subjects' retrieval attempts necessitate constructing descriptions of what they are trying to retrieve (Bobrow & Norman, 1975; Norman & Bobrow, 1976, 1979), it seems possible that mind-sets provide perspectives (Bobrow & Winograd, 1977) that allow for the easy construction of specific descriptions. The deliberative mind-set, for instance, should favor descriptions phrased as pros and cons, benefits and costs, hopes and fears, all tied to the specific conflicts of the depicted characters given as retrieval cues. In other words, the deliberative mind-set makes for the ready construction of descriptions that specify expected-value-related information, whereas the implemental mind-set helps constructing descriptions that specify implementation-related information. As Norman and Bobrow (1979) point out, quick construction of specific descriptions at the time of

retrieval further successful retrieval. Norman and Bobrow also assume that whenever the description of the information sought matches the elaboration of this information at the time of encoding, recall performance is particularly enhanced. It seems possible, then, that deliberative and implemental mind-sets favor congruous recall via congruous elaboration at the time of encoding and via the ready construction of congruous descriptions at the time of retrieval.

### *Summary*

The results of the four experiments reported show that deliberative and implemental mind-sets tune people's cognitive functioning so that congruous thoughts become readily accessible and congruous information is processed effectively. Most interestingly, both mind-sets possess some stability over time and generalize across situations (the third and fourth studies reported).

## **Mind-Sets and Biased Inferences**

The studies presented above primarily address the questions of what types of thoughts or information are congruous with the deliberative and implemental mind-sets, whether congruous thoughts are more pervasive, and whether congruous information is processed more effectively. However, both mind-sets can also be assumed to differentially affect the way in which congruous or incongruous information is handled. We hypothesized that information related to feasibility and to desirability are analyzed in a distinct manner. Whereas in a deliberative mind-set information related to desirability is assessed impartially, assessment partial to the chosen goal is expected in an implemental mind-set. Also, feasibility is expected to be assessed rather accurately in a deliberative mind-set, whereas optimistic assessments that overestimate the actual feasibility of the intended outcome are expected in an implemental mind-set. We conducted two studies on each of these issues. The first two studies were thought-sampling studies related to predecisional individuals' assessment of desirability. The second two studies used the illusion-of-control paradigm (Alloy & Abramson, 1982) and related to assessing feasibility when a deliberative or implemental mind-set has been created experimentally.

### *The Counterplea Heuristic*

Is there an impartial analysis of expected value in individuals with a deliberative mind-set? To answer this question, we (Gollwitzer & Heckhausen, 1987, Study 2) asked female university students to name an unresolved personal problem for which they wished resolution but that for some reason they had not resolved yet (e.g., "Should I move from home?" "Should I switch my major?" "Should I study abroad?"). Then we asked subjects to achieve clarity with respect to whether they wanted to make a change decision; we expected this instruction to trigger intensive deliberation and to create a deliberative mind-set. We also asked subjects to report back to the experimenter when they felt that further mentation would not achieve greater clarity.

Subjects were then given the thought-sampling questionnaire (described above), because subjects' answers to this questionnaire allowed us to study the temporal order of the flow of conscious thought. We scored subjects' thoughts according to a coding scheme that differentiated between positive and negative consequences of having achieved the desired outcome as implied by a change decision. First, we noticed that positive and negative consequences were pondered with equal frequency. More interestingly, when we put the thoughts reported into the correct temporal order, we discovered that deliberation followed a certain pattern. Deliberation started with reflection on the positive incentives of wish fulfillment (e.g., having moved from home). However, subjects did not indulge in these positive consequences, but immediately turned toward reflecting on negative incentives. It seemed that these deliberating people played their own devil's advocate: Their initial enthusiasm about the positive aspects was tempered with a counterplea pointing to negative consequences.

We tried to replicate this observed pattern of meditating on positive and negative consequences with a different sample of subjects—that is, male students at a military academy (Gollwitzer & Heckhausen, 1987, Study 2). Although these students named rather different unresolved problems (e.g., "Should I acquire a flying license?" "Should I buy new skiing equipment?" "Should I learn how to hang-glide?"), the same temporal pattern of thinking about the positive and negative consequences emerged. Obviously, people who become intensely involved with deliberating an unresolved personal problem attempt an impartial analysis of potential consequences. Even though the positive consequences are most salient at the beginning, negative prospects are quickly compiled in order to contrast the desired positive consequences with potential negative consequences. Thus, desired consequences are pitted against those that are feared; therefore, there is no partial analysis focusing exclusively or primarily on desired consequences.

The issue of impartial information processing prior to making a decision is not new. Festinger (1964) reported a number of studies that addressed the cognitive functioning of predecisional subjects. All of these studies assumed that an impartial analysis would not affect the initial divergence of attractiveness between choice alternatives (Davidson & Kiesler, 1964; Jecker, 1964; Walster & Festinger, 1964). Other studies defined impartiality as an equal amount of attention paid to each of the choice alternatives, as measured by looking time (Gerard, 1967), listening time (Brock & Balloun, 1967), or more recently in terms of recall performance (Beckmann & Gollwitzer, 1987).

However, these different approaches to predecisional impartiality do not capture the individual's analysis of decision-relevant information. An impartial analysis does not necessarily leave the divergence of attractiveness between choice alternatives untouched, and a partial analysis may be conducted even when the attention paid to choice alternatives (as measured in terms of encoding time or recall performance) is about equal. Not surprisingly, then, conflicting findings have been reported by studies that adhere to these operationalizations of impartiality (e.g., Janis & Mann, 1968; Mann, Janis, & Chaplin, 1969). Therefore, the

somewhat old-fashioned thought-sampling technique we employed may actually provide the most valid data on the question of whether predecisional deliberation is impartial, because it captures subjects' actual thought processes.

We have not yet used our thought-sampling technique to test the hypothesis that the implemental mind-set leads to a partial analysis of expected-value-related information. But rather unambiguous support for such partial information processing after a decision is available elsewhere (Wicklund & Brehm, 1976). Researchers in the tradition of dissonance theory observed that postdecisional subjects increased the attractiveness of the chosen alternative and decreased the attractiveness of the nonchosen alternative (Brehm, 1956). In addition, postdecisional individuals were found to selectively seek information that potentially supported their choice and to actively avoid nonsupportive information (Frey, 1986). These findings have been interpreted either in terms of justifying one's decision in order to fulfill a need for consistency (Insko, Worchel, Folger, & Kutkus, 1975) or in terms of justifying one's decision for the purpose of arriving at an "unequivocal action orientation" that precludes further deliberation of the choice alternatives (Jones & Gerard, 1967; Wicklund & Frey, 1981).

This latter interpretation of postdecisional partiality is similar to our perspective that an implemental mind-set yields a partial analysis of expected-value-related information in order to promote immediate and persistent implementation of the chosen goal. The minor difference between the two perspectives may be the following: The mind-set perspective suggests that doubts about the actual desirability of the chosen goal are first of all avoided by concentrating on the implementation of the chosen goal. Only when this fails are postdecisional individuals assumed to resort to justifying their choices by increasing their expected desirability.

### *Illusion of Control*

How do the deliberative and implemental mind-sets affect the analysis of information related to the issue of feasibility? Our hypothesis was that the deliberative mind-set should spawn an accurate assessment of the probability of achieving a certain outcome, whereas the implemental mind-set should lead to inaccurate, optimistic assessments. We tested these hypotheses in two experiments employing an illusion-of-control paradigm (Gollwitzer & Kinney, 1989).

In the contingency learning task designed by Alloy and Abramson (1979), subjects perform numerous trials on a single-stimulus apparatus. In this task, subjects are asked to determine to what degree they can influence the onset of a target light (outcome) by choosing to press or not to press a button (alternative actions). By observing whether or not the target light turns on, subjects estimate how much influence or control they have over the target light onset. The experimenter can vary the actual degree of control by manipulating the frequency of light onset associated with each of the two action alternatives (pressing or not pressing). The smaller the difference between these two frequencies, the less objective control subjects have over target light onset.

An extensive body of research (for a comprehensive review, see Alloy & Abramson, 1988) has revealed that nondepressed individuals claim to possess control over desired outcomes that are noncontingent on subjects' actions, whenever these outcomes occur frequently (e.g., in a 75-75 problem, where the target light comes on in 75% of pressing and 75% of nonpressing responses) as compared to infrequently (e.g., in a 25-25 problem). We hypothesized that the inaccurate, optimistic judgments of control (action-outcome expectancy) found with noncontingent but frequent outcome problems should be attenuated in deliberative mind-set subjects, and that they should be aggravated in implemental mind-set subjects.

In our first study (Gollwitzer & Kinney, 1989, Study 1), we modified the Alloy and Abramson (1979) paradigm by adding a second apparatus and by asking subjects to work on five sets of 20 trials. To create a deliberative mind-set, we told subjects that their objective in the first part of the experiment was to decide (after completing the five sets) on which of the two available apparatuses they wanted to work during the second part of the experiment. To allow for an informed decision, subjects were encouraged to alternate between the two apparatuses. We attempted to create an implemental mind-set by asking subjects to decide on the sequence of alternation between apparatuses with respect to all five sets of trials *before* starting the first set, and then to try to produce as many light onsets as possible.

Two problem conditions were established, a 75-75 problem and a 25-25 problem. Accordingly, both apparatuses presented either noncontingent frequent or noncontingent infrequent onset of the target light. When target light onset was frequent (the 75-75 problem), implemental mind-set subjects reported inaccurately high, illusionary judgments of control, whereas deliberative mind-set subjects showed modest control judgments. Apparently, the deliberative mind-set prevents people from being lured into illusionary optimism; that is, they recognize that high frequency of a desired outcome is not necessarily a valid indicator of one's degree of influence over the outcome. With respect to the 25-25 problem, both mind-set groups showed modest control judgments. This indicates that implemental mind-set subjects do adapt to the constraints of reality. They do not blindly perpetuate an impression of control over target outcomes, but rather accept that they have little control when too many failures are encountered.

This experiment may be criticized on two different grounds. First, one could argue that the implemental mind-set subjects may have been reluctant to tell the experimenter that they made a bad choice of alternation between apparatuses; consequently, they may have inflated their control judgments simply to keep up a good impression. Second, Barry Schwartz (1988) recently reported an illusion-of-control experiment where he pretrained subjects on a button-pushing task that offered only two buttons. In the pretraining task, he either established a rule discovery orientation (subjects had to determine which sequences of button pressing led to reinforcement in three different sequence problems) or a reward orientation (subjects were reinforced for four pushes, in any order, on each of the two buttons). Rule discovery subjects showed less illusion of control than reward



subjects in a subsequent Alloy and Abramson type of contingency learning task. One could argue that our deliberative mind-set manipulation was actually a rule discovery manipulation, since subjects were instructed to determine on which of the two apparatuses they would do better, whereas the implemental mind-set manipulation was a reward orientation manipulation, since subjects were instructed to produce as many target light onsets as possible.

Both problems can easily be avoided, however, when a mind-set manipulation is employed, as described in the fairy tale experiment above. Accordingly, we ran a second study (Gollwitzer & Kinney, 1989, Study 2) where one-third of the subjects meditated on an unresolved personal problem requiring a change decision by carefully deliberating the expected value of making a change decision (deliberative mind-set). Another third made specific plans for implementing an intended project by delineating exactly when, where, and how they wanted to initiate relevant actions (implemental mind-set). Once both groups of subjects had finished these mentations, they were asked to work on a contingency problem that presented frequent noncontingent target outcomes (a 75-75 problem). The instructions for completing this task were identical for both groups of subjects; that is, they had to discover *how* to produce target light onset. A set of 40 trials was offered. We also added a control group (the last third of the subjects) that did not receive any mind-set manipulation, but worked only on the contingency problem.

Deliberative mind-set subjects again showed the most accurate judgments of control; that is, their control judgments were lower than those of control and implemental subjects. Implemental mind-set subjects evidenced control judgments that were even (albeit not significantly) more illusionary than those of control subjects. Supporting our mind-set interpretation of these findings, deliberative mind-set subjects' judgments of control correlated negatively with the reported "personal importance" of the problem pondered during the predecisional mentation. Apparently, the more involved subjects' deliberation was, the more realistic their subsequent judgments of control were. A parallel finding was observed for implemental subjects. Here, judgments of control were positively related to subjects' anticipated frustration if the project should (for whatever reason) fail to be implemented.

The present findings not only support our hypothesis that a deliberative mind-set spawns accurate control judgments whereas the implemental mind-set favors illusionary optimism, but also offer a new perspective on the phenomenon of illusion of control. It seems possible that illusion of control is generally based on an implemental mind-set. That is, whenever subjects commit themselves to achieving a desired outcome, they are likely to experience illusion of control. Data from Martin, Abramson, and Alloy (1984) and Vazquez (1987) support this line of thought: Whenever it was made difficult for subjects to commit themselves to achieving the target outcome, subjects failed to evidence illusion of control. Also, when Langer (1975) introduced the concept of illusion of control, she discovered that various factors making a luck task (i.e., random outcomes) appear to be a skill task manage to produce illusion of control. Viewed in the context of our theoretic-

cal framework, the presence of skill-related aspects in a task may induce subjects to commit themselves to the goal of achieving the desired outcome, even though its appearance is solely determined by chance. In other words, a goal commitment emerges that allows for the development of an implemental mind-set.

Finally, our mind-set conceptualization also provides a new framework from which to view "depressive realism" (i.e., the observation that depressed people do not experience illusion of control when noncontingent outcomes appear frequently). Conceivably, depressives find it particularly difficult to set for themselves the goal at hand (e.g., to maximize target light onset) because of pervasive negative beliefs about themselves—that is, their abilities, past performances, intelligence, and strengths (Beck, 1967, 1976). Such beliefs should generate doubts concerning the attainability of the given goal and thus should hinder goal commitment. Consequently, no implemental mind-set may evolve, and depressed people thereby remain insusceptible to feelings of illusionary optimism.

### *Summary*

The findings of the last four experiments reported suggest strongly that deliberative mind-set subjects do analyze the positive and negative consequences of a prospective goal impartially. In addition, they make rather accurate estimates of action–outcome probabilities. The latter is definitely not true of implemental mind-set subjects: They overestimate these probabilities, thus showing illusionary optimism.

One wonders whether the deliberative mind-set favors accurate probability judgments in general, and not only when action–outcome expectancies are at stake. When wishes are deliberated, the probability (certainty) that the desired outcome may be reached is an important concern. Clearly, part of the answer to this question is related to action–outcome expectancy (i.e., how certain people are that they can control the desired outcome). However, there are other possible answers. The more general answer relates to people's beliefs that they possess relevant action potentials (i.e., their self-concepts of relevant competencies); the more specific answer relates to beliefs associated with specific courses of action (i.e., how certain is it that doing X will lead to the desired outcome). Certainty is of relevance again when an individual ponders the probability that the achieved outcome will lead to a desired consequence. To answer this question, the individual must estimate the probability that certain events will occur. As we know from decision research (Baron, 1988; Slovic, Lichtenstein, & Fischhoff, 1988), people have difficulty with deriving accurate estimates. They employ numerous heuristics to ease this task (Nisbett & Ross, 1980; Tversky & Kahneman, 1973, 1974), but more often than not go astray (e.g., the gambler's fallacy, the conjunction fallacy). In particular, they are overconfident when estimating the probability of desired events (Hoch, 1985) or frequent events (Fischhoff, Slovic, & Lichtenstein, 1977). In addition, they cling to an initial estimate even when evidence accrues that urges correction; in other words, people generally fail to apply Bayes's theorem (Birnbaum & Mellers, 1983).

Should deliberative mind-set subjects do better in all of these probability judgments? Or do improvements in probability judgments generally require instruction in statistics (Nisbett, Fong, Lehman, & Cheng, 1987)? For some of the above-reported failures in assessing the probability of certain events correctly, intensive instruction in statistics seems necessary to achieve noticeable improvements (e.g., when the application of the Bayesian theorem is called for); however, for other failures, such as the overconfidence phenomenon, benefit may result from a deliberative mind-set. With respect to probability judgments related to the feasibility of the desired outcome, however, one would expect that all relevant judgments should become more accurate in a deliberative mind-set.

Moreover, one wonders whether the deliberative mind-set may also reduce shortcomings people evidence when analyzing the desirability of a choice. As decision researchers have repeatedly observed (Baron, 1988; Slovic et al., 1988), people ignore minor differences between options; they employ simplified strategies (e.g., elimination by aspects); they avoid tradeoffs between equally important consequences; they weight negative consequences differently from positive consequences, thus falling prey to framing effects; and they overweight consequences that are absolutely certain (the certainty effect). Moreover, many potential consequences are not even considered, and relevant values, attitudes, and goals that allow one to estimate the attractiveness of consequences are ignored (in particular, those that are contradictory). Again, one may raise the question of whether people need explicit training to avoid these shortcomings. So far, no research has been conducted to explore whether a deliberative mind-set reduces these shortcomings.

Research conducted in the realm of person memory suggests that this may be possible. During impression formation, people give greater attention and processing to relatively infrequent behaviors that do not match the overall picture of the target person (i.e., are inconsistent or contradictory). However, once an impression has been formed, it is the consistent information that is preferentially encoded and better remembered (for reviews, see Higgins & Bargh, 1987; Ruble & Stangor, 1986). Apparently, as soon as one is ready to act on an impression formed (implemental mind-set), the thorough analysis of the information at hand (associated with the deliberative mind-set during impression formation) vanishes.

### **Mind-Sets and Open-Mindedness**

We hypothesized that the deliberative mind-set increases a person's receptiveness to a broad range of incoming information, whereas the implemental mind-set decreases such receptiveness. We thought that two different structural qualities of a person's information processing might account for this. First, the more heeded information (i.e., information to which individuals are attending) people can encode into short-term memory, the higher their receptivity should be. Second, people should show higher receptivity if their allocation of attention is very

mobile and flexible, because that should allow them to pick up peripheral information. Accordingly, we conducted experiments that measured amount of heeded information encoded and allocation of attention in deliberative and implemental mind-sets.

### *Noun Span*

As pointed out by Dempster (1985) and others (Case, Kurland, & Goldberg, 1982; Chi, 1976), the width of a person's noun span is a good indicator of the amount of heeded information a person successfully encodes into short-term memory. In a typical noun span experiment, subjects are read a list of words presented less than 1 second apart. When the experimenter has pronounced the last word of the list, subjects are requested to immediately repeat all of the words in the order presented.

For our experiment, we (Heckhausen & Gollwitzer, 1987, Study 2) prepared a whole set of word lists, including lists consisting of five, six, and seven one-syllable nouns. We read a first block of word lists to subjects to obtain baseline scores of their noun span. Then subjects were given the cover story of the first experiment reported above, which offered subjects a choice between test materials for a creativity test (Heckhausen & Gollwitzer, 1987, Study 1). The subjects were interrupted either prior to making a choice of test material (the deliberative mind-set group) or shortly thereafter (the implemental mind-set group). Immediately after the interruption, another block of word lists was read to the subjects. The words on the lists for the baseline measure and the critical second test were irrelevant to making a choice between test materials. We also employed a control group that was never offered a choice between test materials, but still took the baseline and critical noun span test.

When computing the noun spans via a classic procedure described by Woodworth and Schlosberg (1954, p. 696), we found that deliberative mind-set subjects showed a broader span in the second, critical assessment, as compared to their baseline scores. Their noun span increased after they had moved from the ordinary test situation (testing session for baseline data) into a deliberative mind-set associated with contemplating the choice of test material. This increased noun span was also significantly elevated as compared to both the first and second assessments of the control group. For the implemental mind-set group, no significant decrease in noun span was observed between the first and second assessments; possibly, the task of planning one's performance on the chosen creativity test was just not complex and involving enough to create a pronounced implemental mind-set.

It might be suggested that the superior performance of the deliberative mind-set subjects on the noun span test may have been rooted in an increase in nonspecific activation caused by disrupting deliberation. However, the results of a further study (Heckhausen & Gollwitzer, 1986, Study 3) do not support this explanation. This study employed exactly the same paradigm as the noun span experiment, except that subjects worked on simple arithmetic tasks instead of recalling lists of nouns. We thought that performing highly routinized and nearly

informationless mental tasks such as these should profit from an increased level of activation. Accordingly, if performance on such tasks was not facilitated when these tasks were solved within a deliberative mind-set, nonspecific activation was unlikely to have produced the increase in noun span. As it turned out, no differences in performance were observed between the groups.

### *Mobile Allocation of Attention*

The last study to be presented here suggests that a deliberative mind-set involves a greater receptivity to incoming information, because comparatively more heeded information is encoded. But there should be a second source of greater receptivity—that is, an increased readiness to encode peripheral, incidental information. Flexible, mobile allocation of attention should enhance the individual's chances of encoding such information, whereas allocating attention solely to information that is already heeded should reduce them.

We conducted the following experiment (Gollwitzer & Heckhausen, 1987, Study 1) to explore whether the deliberative mind-set increases flexible allocation of attention and the implemental mind-set reduces it. The idea underlying this study drew on research done by developmental psychologists interested in the development of attentional processes in children (Hagen & Hale, 1973). Much of this research (e.g., Miller & Weiss, 1981) has involved the so-called "central-incidental learning task," in which children are asked to remember the location of certain objects designated as central while other objects designated as incidental serve as potential distractors. At the end of this task, children are unexpectedly asked to recall the incidental objects in addition to the central objects; this determines whether attention was also allocated to the incidental information.

We modified this task so that adults would also find it involving. In our task, the central information was a short story consisting of factual statements about a small university in northern Germany. This story was presented sentence by sentence, and subjects were told to memorize it for later recall. The incidental information took the form of single, unrelated two-syllable nouns placed next to each sentence. These nouns also were irrelevant to the decisional problem that was used to create deliberative and implemental mind-sets (see below). After presentation of the stimulus material, a recognition test for the incidental information was applied. Recognition of the incidental material seemed a more appropriate measure than recall, because recall speaks to the accessibility of information in memory, whereas the availability of the incidental information was at issue here. The latter is more sensitively captured by a recognition procedure (see Bargh & Thein, 1985; Srull, 1981, 1984).

Subjects viewed the information and had to recall it either prior to making a decision (deliberative mind-set group) or shortly thereafter (implemental mind-set group). In the control group, subjects worked on the central-incidental task, neither having made nor expecting to make a decision. The decision that subjects had to make was embedded in the following cover story: Subjects were to play the part of a personnel manager. The problem at hand was to hire one of two applicants for the position of a product manager.

Deliberative mind-set subjects recognized the incidental information significantly better than implemental mind-set subjects, with control subjects showing a recognition performance that tended to be better than that of the implemental mind-set subjects and worse than that of the deliberative mind-set subjects. In addition, there was no difference among these three groups with respect to how certain they felt about the correctness of their judgments. Accordingly, the hypothesis that the motivational mind-set is characterized by more mobile allocation of attention than the implemental mind-set finds support in this pattern of data.

### *Summary*

The last two experiments presented suggest that deliberative mind-set subjects are more receptive to available information than are implemental mind-set subjects. This is because deliberative mind-set subjects (1) encode comparatively more heeded information into short-term memory, and (2) show more mobile allocation of attention. The conducted experiments suggest that the deliberative mind-set enhances receptivity via encoding of heeded information and that it tends to do so via mobile allocation. With respect to the implemental mind-set's postulated reduction in receptivity, our findings are much weaker. There is no reduction in terms of encoding, and only a tendency with respect to allocation of attention. Possibly we failed to create strong implemental mind-sets in both experiments reported. Subjects may not have experienced a full-blown implemental mind-set, and this may have been the reason why we did not observe any significant reductions in receptivity.

## **MIND-SET EFFECTS: THEIR CORRELATES AND MECHANISMS**

Not all mind-sets influence cognitive processing to an equal degree; some are more potent than others. What are the correlates (variables) that accompany these differences? These variables should be different for each of the action-related mind-sets outlined at the beginning of this chapter (the deliberative, implemental, actional, or evaluative mind-set). But all of these variables are related to the individual's involvement with trying to solve the task associated with the respective action phase (the predecisional, preactional, actional, or postactional phase).

For instance, in the predecisional phase the task is to determine which of one's wishes is most desirable but still feasible. Whether intensive task involvement (i.e., intense deliberation) will actually occur depends on the wish that is scrutinized, the surrounding environment, and various personal attributes. Intense deliberation should be hindered when the individual's freedom of choice is restricted by others (e.g., superiors who make the final decision); when habit or need intervenes (i.e., there is no question which wish will be chosen); or when already chosen superordinate goals determine which subordinate wish will be implemented (i.e., goal-closed decisions; Toda, 1976). It should be stimulated

whenever conflict exists between wishes that appear equally desirable or between feasibility and desirability of a given wish. Other variables that should stimulate intense deliberation are the accountability and irreversibility of the individual's choice and the amount of information available. A number of potentially relevant personal attributes, such as certainty orientation (Sorrentino & Short, 1986), state orientation (Kuhl, 1984), sensitization coping style (Olson & Zanna, 1979), failure threat and depression (Pietromonaco & Rook, 1987), and the state of private self-awareness (Wicklund & Ickes, 1972), may all favor intense deliberation. Finally, it also seems possible to intensify deliberation through self-instructions and through instructions given by the experimenter (see Mischel's [1983] work on self-regulation).

All of these variables determine how involved a person may become with deliberating wishes, and thus have to be considered as potential correlates with the potency of the deliberative mind-set. Similarly, becoming intensely involved with the task of promoting the initiation of actions (implemental mind-set), the effective execution of goal-directed activities (actional mind-set), and the proper evaluation of the effects of one's goal striving (evaluative mind-set) should all depend on the specific qualities of the problem at hand, the situational context, and various personality attributes. I have tried to specify these variables elsewhere (Gollwitzer, 1990); as it turns out, there are different correlates with the potency of each of these mind-sets. I do not repeat this analysis here, but instead raise the question of what types of mechanisms produce mind-set effects.

The classic definition of mind-set (*Einstellung*) advanced by the Würzburg school suggests that the mechanisms mediating mind-set effects are located in the cognitive processes advancing the solution of the task that stimulated the mind-set. In the presented research on deliberative and implemental mind-sets, we observed that mind-sets affected subjects' thought production, the recall of congruous information, the analysis of desirability-related information, the inferences made on the basis of feasibility-related information, and finally the attentional processes when irrelevant information had to be encoded. It appears, then, that deliberative and implemental mind-sets make any knowledge that helps to solve the respective task more accessible. Part of this knowledge is categorical or episodic and relates to the specific problem at hand (i.e., the decision to be made or the project to be planned). The other part is procedural and relates to how wishes are deliberated (deliberative mind-set) or how projects are planned (implemental mind-set) in general. It is this latter part that we found to transfer to subsequent, unrelated tasks.

In this sense, the observed mind-set effects are most similar to the cognitive-tuning effects originally analyzed by Zajonc (1960) and extended by Brock and Fromkin (1968), Cohen (1961), Leventhal (1962), and most recently by Higgins, McCann, and Fondacaro (1982). This research employs a paradigm in which subjects are assigned different tasks. Half of the subjects are told to transmit their impression of a target person to others, whereas the other half are told to receive others' impressions of the target person. Subsequently, how subjects organize information on the target person and what kind of information is suppressed are

analyzed. Clearly, these studies also demonstrate that different task assignments may act as steering mechanisms for organizing presented information. The research reported here expands on this idea by stating that the tasks people face at the various action phases create distinct mind-sets that tune people's cognitive functioning.

The observed mind-set effects should not be confused with research findings reported under the heading of the "New Look" in perception (Bruner, 1957; Bruner & Goodman, 1947). This research introduced the notion of "category accessibility." It is assumed that the ease with which a given stimulus input is coded in terms of a given category depends not only on the match between the features of the stimulus and of the category; other factors, such as expectancy and need states, can also increase the likelihood that a particular category rather than an alternative will be applied to the input. More recently, it has been demonstrated that simply activating (priming) a concept in one task is capable of increasing the accessibility of that construct in an unrelated subsequent task where subjects are asked to categorize a target person's behavior (Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). In general, this research focuses on how a certain category is made more accessible so that it influences the interpretation of available information in its own terms. Our mind-set research, on the other hand, explores the effects that becoming intensely involved with the task of deliberating or planning has on the accessibility of appropriate cognitive procedures. In this sense, our research is more similar to recent attempts to delineate effects of goals or roles on the elaboration and organization of available information, as reported by Srull and Wyer (1986) and Zukier (1986), respectively.

Also, there is the question of whether mind-set effects are based on active, conscious processes involving deliberate strategies and control, or on passive, unconscious processes that occur automatically and are uncontrolled (Higgins & King, 1981; Posner & Warren, 1972). As Bargh (1989) pointed out, these aspects of being an intentional (active) process characterized by awareness and control may not always come in the two configurations described (i.e., all three are present or all three are absent), as seems to be the case with our subjects. First, our subjects were *not* aware of the mind-set effects we observed in the illusion-of-control study or in the mobile-allocation-of-attention study (i.e., subjects' certainty ratings were high and did not differ between groups). Second, however, if we had made subjects aware of them (and this is also true for the fairy tale study), subjects could have easily halted (controlled) them. Finally, deliberative and implemental mind-set effects would not occur in the absence of an explicit intention to deliberate an unresolved problem or to plan a chosen project, respectively. So it appears that mind-sets carry more of the qualities of active sets than of passive sets (Higgins & King, 1981).

Finally, how do we account for the observed transfer of the cognitive processes stimulated by deliberating or planning to subsequent unrelated tasks? This effect reminds of Luchins's (1942) problem-solving experiments, in which he demonstrated that when subjects repeatedly solved a given type of arithmetic



problem suggesting a certain strategy, they then applied this strategy to subsequent arithmetic problems even when other ways of solving the problem were possible or necessary. Obviously, practiced mental operations may transfer from the training context to subsequent contexts to which they do not immediately apply. The questions of what features of the subsequent context enhance this effect, how much time may pass before such effects vanish, and what exactly happens to mental procedures during practice remain open. Recent research by J. R. Anderson on the acquisition of cognitive skill has begun addressing these issues (Anderson, 1982, 1987; in the realm of social cognition, see Smith, Branscombe, & Borman, 1988; Smith & Lerner, 1986).

## GENERAL SUMMARY AND CONCLUSION

The starting point of this chapter is the question of whether the course of events associated with goal-oriented behavior is homogeneous. Although early researchers (e.g., Narziss Ach, Kurt Lewin) studying goal-oriented behavior vehemently argued against such a view by suggesting that goal setting and goal striving are ruled by different principles, this insight was widely ignored in later research on motivation (e.g., in research stimulated by Atkinson's risk-taking model). We introduced a model of action phases in a renewed attempt to delineate the various distinctive phenomena of goal-oriented behavior. These phenomena are considered to be deliberating wishes (potential goals), planning the implementation of chosen goals, acting on these goals, and evaluating one's goal striving (i.e., the outcome and its consequences).

Under the assumption that these phenomena present themselves to individuals engaged in goal-oriented endeavors as tasks that need to be solved in succession, the concept of mind-set has been introduced. It has been argued that being involved with these tasks leads to characteristic cognitive orientations (mind-sets) that are beneficial for solving these tasks efficiently. The cognitive orientations related to each of these tasks (or phenomena) have been spelled out. Finally, a number of experiments have been reported that empirically tested the cognitive orientations postulated for the deliberative and implemental mind-sets. This research has shown that the deliberative mind-set is characterized by cognitive tuning toward outcome expectancy and expected-value-related thoughts and information, by an accurate analysis of outcome-expectancy-related information and an impartial analysis of expected-value-related information, and by a heightened general receptivity to available information. The implemental mind-set, on the other hand, is characterized by cognitive tuning toward the implementational thoughts and information, and by an optimistic analysis of expectancy-related information.

These findings strongly suggest that researchers of motivation should question the still-common view that goal-oriented behavior is a homogeneous phenomenon. It seems more appropriate to conceive of goal-oriented behavior as a

succession of distinctive phenomena that are ruled by their own principles. The very recent revival of interest in goal concepts (Pervin, 1989) and in the issue of commitment (Brickman, 1987) seems based on this view.

But the presented findings are also important in their own right. They suggest that the individual's cognitive apparatus readily adjusts to the various demands of goal-oriented behavior, and they thus stimulate a new perspective on common topics in the psychology of motivation (e.g., illusion of control), clinical psychology (e.g., depressive realism), decision making (e.g., certainty judgments), and social cognition (e.g., impression testing vs. impression formation). Finally, they imply interesting answers to the question of how people can more effectively turn their wishes into action.

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