

CHAPTER 2

Action Phases and Mind-Sets

PETER M. GOLLWITZER

Max-Planck-Institut für psychologische Forschung

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