Why We Thought That Action Mind-Sets Affect Illusions of Control

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Gollwitzer and Kinney (1989) proposed the following hypothesis: People who ponder a goal decision (i.e., to either pursue Goal A or B, or to pursue either Goal A or stay passive) develop a deliberative mind-set that allows them to accurately assess whether a desired outcome can be controlled by their actions or not, whereas people who are planning the pursuit of a chosen goal develop a mind-set that fosters illusionary optimism with respect to controlling this outcome. Deviating from the usual course of presentation, I start with describing how we tested this hypothesis and with what results. As we are dealing with a set of studies classified as an overlooked gem, it seems appropriate to first describe the research and its findings. Then I turn to my recollection of how we arrived at this hypothesis. Finally, I address the implications of the Gollwitzer and Kinney findings and how they keep stimulating present research on self-regulation.

How Did We Test the "Action Mind-Sets Affect Illusions of Control" Hypothesis?

To assess illusions of control, we resorted to an intriguing experimental task (i.e., the contingency learning task) developed by Alloy and Abramson (1979). In this task, research participants are asked to find out how much influence they can exert on the onset of a target light (mounted on a small metal box) by choosing to press or not press a button (mounted on an even smaller response panel). Participants commonly go through a series of blocked trials (or at least one block with 40 trials) whereby each trial is indicated by a warning light that is sitting to the left of the target light. Observing whether or not the target light comes on after they have pressed or not pressed the response button, participants learn how much control they have over target light onset. Once a block of trials is finished, participants are asked to indicate on a percentage scale how much control they had over target light onset.

In most experiments using this contingency learning task, the experimenter varies the actual control by manipulating the frequencies of target light onset linked to pressing or not pressing the response button. The smaller the difference between these two frequencies, the less is the objective control participants have

over target light onset. Of most interest, even though participants are sensitive to differences in the amount of control that is given to them over target light onset, Alloy and Abramson (1979) discovered that participants (who are not depressed) can easily be lured into believing they have control even when there is no control at all. When individuals who are not depressed are confronted with noncontingent target light onset (pressing leads to the same amount of target light onset as nonpressing) that is very frequent (e.g., when the target light comes on in both 75% of the pressing responses and 75% of the nonpressing responses; 75/75 problem), participants believe themselves to have control even though there is zero control. Only when noncontingent target light onset is infrequent (e.g., participants are presented with a 25/25 problem in which the target light comes on in 25% of the pressing and in 25% of the nonpressing responses) will participants recognize that they do not have control over target light onset. In other words, participants mistake high frequencies of target light onset as an indication of having control.

I am thankful to Lauren Alloy who (at one of the annual Nagshead Conferences organized by Bibb Latané, sometime in the mid-1980s) introduced me to the contingency learning task and explained to me how this task is assigned to research participants. Alloy and Abramson (1979, 1982) developed this experimental paradigm when analyzing judgments of control in individuals who were depressed as compared with those who were not depressed. Ron Kinney and I were fascinated with this simple and precise way of assessing illusion of control, and we were convinced that it perfectly suited the purpose of testing our idea. Note that this task allows one to measure illusion of control in a more objective manner than is true for other ways, such as, for instance, asking participants whether they are more or less likely than the average college student to experience an unpleasant, relatively uncontrollable event (Perloff & Fetzer, 1986).

Accordingly, we conducted two experiments using the Alloy and Abramson contingency learning task. In the first study, we thought of the following way of involving participants in deliberating a goal choice versus planning a chosen goal. Two apparatuses, each equipped with a target light, a warning light, and a respective response panel, were placed in front of the participants. Unbeknownst to the participants, both

apparatuses were programmed to produce noncontingent onset of the target light; depending on condition, both apparatuses produced noncontingent target light onset either frequently (75/75 problem) or infrequently (25/25 problem). Deliberative mind-set participants were told to alternate between working on the two apparatuses (after each of the five blocks of 20 trials participants were asked whether they wanted to switch or not) in order to find out on which of the two apparatuses they were more successful in achieving target light onset. Implemental mind-set participants were asked to first decide on a particular sequence of alternation between the two apparatuses before they started to work on the first block of trials (i.e., they had to indicate which of the five blocks was to be performed with which apparatus at the outset of the experiment) and then try to achieve as many target light onsets as possible. The results were clear-cut. The deliberative mind-set participants showed rather accurate control judgments in both the infrequent and the frequent target light onset condition, whereas the implemental mind-set participants showed accurate control judgments in the infrequent target light onset condition but inaccurate illusionary judgments in the frequent condition.

Even though this pattern of data was in support of our hypothesis, we were a bit uneasy with respect to the induction of the deliberative and implemental mind-sets. We were worried that the chosen manipulations induced task-sets rather than mind-sets. In other words, the cognitive orientations we had induced by presenting the task to be performed in a deliberative versus an implemental format were also instrumental for the successful performance of the task at hand. Because deliberative mind-set participants were told to find out on which of the two apparatuses they were more successful, making accurate control judgments seems instrumental to solving this task. Implemental mind-set participants, on the other hand, were told to achieve target light onset as much as possible. For this task a tendency to overestimate the degree of control over the outcomes seems to be instrumental to persistence and thus aid task performance.

Yet, the mind-set notion implies that the associated cognitive orientation can also be demonstrated in a context for which it is not immediately instrumental to task performance. In other words, the demonstration of a potent mind-set requires that its cognitive orientation generalize to tasks not responsible for its induction. Thus we decided to conduct a second experiment that used a different mind-set induction and a different, mind-set-irrelevant instruction for the performance of the contingency learning task. In our second study, therefore, all participants were asked to perform a contingency learning task on one and the same apparatus that was programmed to produce only noncontingent, but frequent, target light onset (i.e., one block with 40 trials; 75/75 problem). All participants worked on this task following the simple instruction:

> Your task is to learn how to turn on the target light. You will complete 40 trials, requiring a total of 10 min. You will then be asked to judge how much control you had over the onset of the target light.

Prior to working on the contingency learning task, participants in the deliberative mind-set condition were asked to name an unresolved personal problem (e.g., "Should I move from home or not?") and then reflect on potential immediate and long-term positive and negative consequences of making or not making such a decision. In contrast, participants in the implemental mind-set condition were asked to name a personal goal or project (e.g., "I want to move from home!") to be completed over the next 3 months; then list five behavioral steps necessary for goal completion; and finally make plans with respect to when, where, and how each of these steps was to be implemented. A third group of participants served as a control group and was asked to immediately start with the contingency learning task.

Again, the results were in line with our mind-set hypothesis. Deliberative mind-set participants showed the most accurate judgments of control. Their estimated amount of control was very low, indicating that they recognized that target light onset was not controllable by pressing or not pressing the response button or by producing certain patterns of pressing and not pressing. The low-control judgments of the deliberative participants differed significantly from the higher control judgments of the control participants and the implemental mind-set participants, who reported the highest control judgments. Apparently, the illusion of control that was evident in control participants and that was particularly pronounced in the implemental mind-set participants is drastically reduced by the deliberative mind-set. A mind-set interpretation of these findings is further suggested by the observation that deliberating participants' judgments of control correlated negatively with the personal importance of the unresolved personal problem these participants had been mulling over, indicating that the more involved participants were in deliberating, the more realistic their subsequent judgments of control. An analogous finding emerged for planning participants, whose judgments of control were positively related to the participants' anticipated frustration in case they should fail to implement their chosen goals.

How Did We Arrive at the "Action Mind-Sets Affect Illusions of Control" Hypothesis?

During my graduate education in the late 1970s at the University of Texas at Austin, my supervisor,

Robert Wicklund, and I started to conceive of people's selves or identities as goals. We thought that a person can very well set himself or herself the goal to become a good parent, a brilliant scientist, or a great athlete. If one takes this perspective, the self of a person is no longer just something to perceive and understand but something to be achieved. We turned to writings of Kurt Lewin (1926) and his students, whose tension system theory of goal pursuit, with its notion of substitution, was very helpful to developing our theory of symbolic self-completion (Wicklund & Gollwitzer, 1982; review by Gollwitzer & Kirchhof, 1998). The main proposition of self-completion theory is that once people have set themselves certain identity or self-defining goals, they respond to failure experiences, shortcomings, or barriers not with retreat but instead with intensified efforts to reach the goal. These efforts do not have to alleviate the problem at hand but may involve resorting to anything that indicates goal attainment.

When in the early 1980s Heinz Heckhausen asked me to join him at the Max Planck Institute for Psychological Research at Munich to start a new research unit committed to the analysis of how motivation affects action, we quickly realized that we had a directly opposed conceptual view of motivation. Whereas Heinz Heckhausen's motivation was that of the expectancy-value theorist (Atkinson, 1957) and was thus fueled by the perceived feasibility and desirability of an action, my motivation was that of Lewin's (1926) tension system and was resting in the determination or commitment a person holds with respect to the action goal at hand. Apparently, in my research on self-completion I had been studying issues of goal striving (i.e., thoughts and behavior directed toward existing goals), whereas Heinz Heckhausen in his work on achievement motivation (Heckhausen, 1977) had focused on issues of goal setting (i.e., what goals people find attractive and feasible and, thus, choose for themselves).

To highlight this insight, we suggested making a distinction between motivation and volition. Following the conceptual terms used by Lewin (1926) and Narziß Ach (1935), we dubbed the goal-striving-related motivation with the term *volition*, and kept the term *motivation* for the goal-setting-related motivation. More important, in an attempt to integrate these two kinds of motivation (i.e., motivation and volition), we developed the Rubicon model of action phases (Heckhausen & Gollwitzer, 1987). This model suggests that the course of action can be segmented into four different, consecutive phases that differ in terms of the task that is to be solved by the individual given that she or he wants to perform the course of action successfully. The first phase (predecision phase) is said to pose the task of setting preferences among wishes and desires by deliberating their desirability and feasibility. As people's motives and needs produce more wishes and desires than can possibly be realized, the individual is forced to choose among these desires and thus turn them into goals. Once goals are set, the individual faces the second task (preaction phase), which is getting started with goal-directed behaviors. This may be simple if the necessary goal-directed actions are well practiced and routine but complex if the individual is still undecided about where, when, and how to act. In such complex cases, the execution of goal-directed action has to be planned by deciding on when, where, and how to act. The third task (action phase) is bringing the initiated goal-directed action to a successful ending, and this is best achieved by determined and persistent pursuit of goal completion. Finally, in the fourth task (postaction phase), the individual needs to decide whether the desired goal has indeed been achieved or whether further striving is needed.

The Rubicon model of action phases postulates that a person's psychological functioning in each of these phases is governed by different principles. Classic theories of motivation (adhering to the restricted definition of *motivation* as determined by feasibility and desirability) are said to be well suited to explicating the psychological processes associated with the predecision and postaction phases, whereas theories of volition (i.e., theories on the self-regulation of goal attainment) are most appropriate to explaining the psychological processes that characterize the preaction and action phase. In other words, the predecision and postaction phases are expected to encompass motivational phenomena and processes in the classic restricted sense of the term, whereas in the phases in between volitional phenomena and processes are thought to occur.

This radical statement needed empirical support, and therefore Heckhausen and I conducted an early experiment aimed at demonstrating that individuals placed in the predecision phase evidence different cognitive functioning than do individuals in the preaction phase. Assuming that deliberation of the desirability and feasibility of wishes and desires (the task of the predecision phase) is cognitively more demanding than committing to a plan that specifies, when, where, and how one wants to perform goal-directed actions (the task of the preaction phase), we expected that deliberating individuals experience a higher cognitive load than planning (i.e., preaction) individuals. We therefore interrupted experimental participants who were either in the middle of deliberating a choice between two different tests that presumably measured their creative potential or in the middle of planning how to perform the test they had just chosen and then asked them to take a short-term memory test (i.e., a noun span test that presented nouns irrelevant to the creativity tests at hand). We expected that deliberating participants, because of heightened cognitive load, would evidence a reduced

noun span, compared with their span as measured at the beginning of the experiment. We also expected that deliberating participants would evidence a comparatively more reduced noun span than planning participants because planning was expected to take up less cognitive resources than deliberating.

To our surprise, the results were just opposite to what we had expected. The deliberating participants showed an increase in their short-term memory capacity, compared with both their own earlier span and the span of the planning participants. In an effort to reduce our confusion about these unexpected findings, we turned to our cognitive colleagues at the Max Planck Institute. It was a personal communication by Gerhard Strube (now at the University of Freiburg, Germany) that pointed our heads to the classic concept of mind-set as originally advanced at the turn of the century by the German psychologists Külpe (1904), Marbe (1915), Orth (1903), and Watt (1905), all members of the Würzburg school. These early cognitive psychologists had discovered that becoming intensively involved with performing a given task activates exactly those cognitive procedures that help task completion. The created mind-set (i.e., the sum total of the activated cognitive procedures) is the cognitive orientation most conducive to successful task performance.

The mind-set notion allowed us to interpret the observed noun span data as follows: Deliberating between potential action goals creates a cognitive orientation (the deliberative mind-set) that facilitates the task of the predecision phase, which is to set preferences. As undecided individuals do not know yet in which direction their decisions will finally take them, a heightened receptiveness to all kinds of information (open-mindedness) seems appropriate and functional to task solution. Similarly, planning the implementation of a chosen goal should create a cognitive orientation (the implemental mind-set) that facilitates the task of the preaction phase (i.e., getting started on the chosen goal). As this requires a more focused and selective orientation to processing information, closed-mindedness rather than open-mindedness with respect to available information seems called for. This postulated difference in receptiveness between deliberating and planning individuals is expressed in the fact that the experimental participants in the Heckhausen and Gollwitzer (1987) noun span study processed the presented information in the noun span task faster than planning participants (i.e., the deliberating participants demonstrated a broader noun span than the planning participants).

However, isn't all of this post hoc? This is exactly the type of worry that made me use the mind-set notion as a hypothesis-generating device for subsequent research (summaries by Gollwitzer & Bayer, 1999; Gollwitzer, 1990). If one analyzes the unique demands of the task of choosing between wishes and desires in the predecision phase versus the typical demands of the task of getting started on a chosen goal in the preaction phase, it becomes easy to postulate further cognitive features of the deliberative as compared with the implemental mind-set that can then be tested in new experiments. Following this general strategy, we predicted (Gollwitzer, Heckhausen, & Steller, 1991) that next to a general open-mindedness (deliberative mind-set) versus closed-mindedness (implemental mind-set) as detected in the Heckhausen and Gollwitzer (1987) noun span study, the deliberative mind-set should be characterized by preferentially encoding desirability-related and feasibility-related information, whereas the implemental mind-set should show preferential encoding of implementation-related information.

Moreover, Ron Kinney and I (Gollwitzer & Kinney, 1989) argued that the cognitive tuning toward feasibility and desirability issues in predecisional individuals should not suffice; rather, desirability-related information must be analyzed in an impartial (and not in a biased) manner and feasibility-related information in an accurate (and not in a self-serving) way. Only if feasibility-related information is analyzed realistically, and the pros and cons are weighed impartially, can the individual turn those desires into binding goals that can potentially be realized and possess a genuine attractiveness. Preactional individuals, on the other hand, should not be concerned much with desirability-related and feasibility-related information, as this would only create dysfunctional undecidedness that undermines the task of getting started on the chosen goal. If such information is forced on the individual, it should be distorted in support of the goal decision already made. In other words, the implemental mind-set should favor interpreting desirability-related information in a partial manner (i.e., pros exceed cons) and feasibility-related information in an overly optimistic way. Accordingly, Ron Kinney and I predicted (and later observed in two studies designed to test this prediction) that the implemental mind-set favors illusions of control, whereas the deliberative mind-set hampers such illusions.

Follow-Up Studies With Special Samples and Less Artificial Settings

In an effort to explore how powerful deliberative and implemental mind-sets are in affecting people's judgments of control, Wulf (1991) analyzed whether the commonly observed realistic control judgments of persons who are depressed (i.e., depressive realism; Alloy & Abramson, 1979, 1982) can be elevated to levels of positive illusions by the implemental mind-set. Participants in the study were patients with a high level of depression who received

treatment in either a hospital or a private practice setting. The creation of the mind-sets, the contingency-learning task, and the instructions were the same as in the second study of the Gollwitzer and Kinney (1989) article. Participants in the deliberative mind-set and control participants reported the same low amounts of control, supporting the depressive realism notion. Of most interest, however, the planning participants reported experiencing extremely high amounts of control, thus showing a strong positive illusion. Apparently, the implemental mind-set manages to affect the analysis of feasibility-related information in a way that overly positive control judgments are formed even in people who commonly produce realistic judgments (i.e., individuals who are depressed).

Taylor and Gollwitzer (1995) tested in two experiments whether deliberative and implemental mind-sets affect people's control judgments not only in a laboratory setting when working on an unfamiliar novel task but also when assessing one's vulnerability to everyday risks. In the first study, the analyzed risks involved being in an automobile accident, becoming divorced, becoming depressed, developing a drinking problem, and being mugged. Participants were college students who had to judge these risks for themselves and for the average college student. Mind-sets were induced via the procedures used in the second Gollwitzer and Kinney experiment just before the participants had to judge the named risks. Even though all participants perceived themselves as less vulnerable to these risks than the average college student, deliberating participants did this to a lesser degree than planning participants. This more pronounced illusion of invulnerability in the implemental mind-set than in the deliberative mind-set participants was replicated in a second study, in which participants had to rate their vulnerability to relatively controllable risks (e.g., developing an addiction to prescription drugs, having a drinking problem) versus more uncontrollable risks (e.g., developing diabetes, losing a partner to an early death). For both types of risks, planning participants reported a higher invulnerability as compared with the average college student than did deliberating participants. The fact that mind-sets managed to modify the perceived vulnerability of controllable as well as uncontrollable risks attests again to their enormous impact on the analysis of feasibility-related information. Even more important, mediational analysis demonstrated for both studies that the mind-set effects were not based on changes in mood associated with the mind-set inductions. This makes it all the more justified to interpret action mind-set effects in terms of the activation of mind-set-congruent cognitive procedures.

Implications

Applied Implications

There are times when people need to make decisions, and there are times when the decisions made have to be implemented. From the perspective of effective action control in everyday life, then, it seems helpful to activate the respective cognitive procedures that facilitate goal setting and goal implementation when making decisions versus acting on them is at issue. In other words, people should allow for and become involved in deliberative or implemental mind-sets, depending on whether a goal decision or the implementation of a chosen goal is called for. However, are people willing to embrace the mind-sets provided, and are they in a position to instigate these mind-sets when they are needed? If one assumes that patients who are depressed are chronically captured by a deliberative mind-set, the findings of Wurf (indicating that implemental mind-set instructions make patients who are depressed experience illusions of control) strongly suggest that people readily embrace the mind-sets that are provided to them. Moreover, Taylor and Gollwitzer (1995, Study 3) observed that the simple request to find clarity with respect to an unresolved personal problem induced a pro-versus-con type of thinking in research participants that was very similar to the thinking induced by our more sophisticated deliberative mind-set instructions used in other experiments. In summary, then, both of these findings suggest that people in everyday life can easily be induced into mind-sets by others and create mind-sets for themselves. Thus getting involved in an action mind-set that matches the problem at hand (making a goal decision vs. implementing a chosen goal) qualifies as an effective action control strategy in real life.

Theoretical Implications

Next to integrating motivational and volitional perspectives within one theoretical framework, the Gollwitzer and Kinney mind-set studies on illusion of control also pertain to the illusionary optimism versus realism controversy triggered by Taylor and Brown's (1988) article on positive illusions. Taylor and Brown proposed that mentally healthy people are not characterized by accurate assessments of their personal qualities, realistic estimates of personal control, and a realistic outlook on the future; instead, they maintain overly positive, self-aggrandizing perspectives of the self, the world, and the future. More specifically, mentally healthy people are said to be characterized by unrealistically positive self-perceptions, an illusion of a high degree of personal control, and unrealistic optimism about the future. Instead of being maladaptive,

these positively distorted perceptions foster the criteria normally associated with mental health: positive regard, the ability to care for and about other people, and the ability to manage stress effectively (Taylor & Brown, 1994).

Despite empirical support for the model (Taylor & Armor, 1996; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000), this portrait of the healthy person raises a disturbing question: If healthy people's perceptions are marked by positive bias, how do they effectively identify and make use of negative feedback they may encounter? If people are capable of explaining away, compartmentalizing, or otherwise dismissing or minimizing negative feedback, as Taylor and Brown (1988) suggested, these self-serving illusions that bolster self-esteem and produce a positive mood in the short run may ultimately set people up for long-term disappointment and failure as they fail to incorporate negative feedback into their goal setting and planning (Colvin & Block, 1994; Weinstein, 1984).

The Gollwitzer and Kinney (1989) research on illusion of control offers the following insights to the debate about positive illusions versus realism: First, neither realism nor positive illusions seem adaptive in general to a person's psychological functioning. Realistic thinking seems functional when it comes to making goal decisions, whereas positive illusions seem functional when the chosen goals are to be implemented. Second, people can easily open the window to realism provided by the deliberative mind-set. People do not have to go through the effortful mental exercises we have induced in our experiments to create a deliberative mind-set; simply trying to achieve clarity in regard to an unresolved personal problem will trigger an intensive deliberation of pros and cons (Taylor & Gollwitzer, 1995, Study 3). Third, postdecisional individuals who plan the implementation of a chosen goal seem to be protected from an accurate analysis of feasibility-related information and thus can benefit from illusionary optimism that makes them strive harder to reach their goals, especially in the face of hindrances and barriers. It appears, then, that the individual's cognitive apparatus readily adjusts to the various demands of the control of action: Choosing between action goals leads to realism, and implementing chosen goals leads to positive illusions.

What Is Happening in Present Day Action Mind-Set Research?

Mind-Sets and Biased Inferences

A series of studies by Gagné and Lydon (2001a) on the issue of relationship predictions showed that individuals with a deliberative mind-set are more accurate in their forecasts of survival of their romantic relationships than are individuals with an implemental mind-set. This effect was even more pronounced for long-term than for short-term relationship survival. Of most interest, participants with a deliberative mind-set did not achieve this heightened accuracy by taking a pessimistic attitude.

Evidence for differences between the deliberative and implemental mind-sets in processing pros and cons was provided by a recent study by Harmon-Jones and Harmon-Jones (2002, Study 2). They tested the effects of mind-sets on the postdecisional spreading of alternatives, a classic cognitive dissonance paradigm (Brehm & Cohen, 1962). Using this paradigm, dissonance researchers have found that after making a choice between two options, the chosen option becomes evaluated more positively whereas the nonchosen option becomes evaluated more negatively. Harmon-Jones and Harmon-Jones found that the implemental mind-set increased postdecisional spreading of alternatives, whereas the deliberative mind-set reduced it.

There is even some suggestive evidence that forcing a planning individual to deliberate over his or her choice results in even greater biased processing of information. A set of studies by Gagné and Lydon (2001b) suggests that deliberation over goal decisions that have already been made can initiate defensive processing of information that leads to even greater biasing. In one study, they asked participants involved in romantic relationships to deliberate a relationship or a nonrelationship goal decision. They found that when asked to rate how their partner compared with the average, those individuals asked to deliberate over a relationship goal decision gave much higher ratings than those who were asked to deliberate over a nonrelationship goal decision. Of interest, these ratings were also higher than those of implemental participants who had been planning the implementation of a relationship goal.

Gagné and Lydon (2001b) suggested that the deliberation of a relationship goal may have been perceived as threatening, resulting in greater enhancement of the partner's attributes. In a second study, they measured the commitment participants had to their relationship and found that high-commitment but not low-commitment participants defended against the threat of a deliberative mind-set by increasing their positive views of their partner. This pattern of findings indeed supports the assumption that deliberation may have threatened the participant's perceived ability to attain the goal of maintaining the relationship. In response, these individuals reasserted their commitment to the relationship by boosting the ratings of their partner.

Finally, Puca (2001) tested deliberative and implemental participants' realism versus optimism in terms of choosing test materials of different difficulty (Study 1) or predicting their own future task perfor-

mance (Study 2). Deliberative participants preferred less difficult tasks and overestimated their probability of success less than implemental participants. Moreover, deliberative participants referred more than implemental participants to their past performance when selecting levels of difficulty or predicting future performance.

Mind-Sets and Behavior

Gollwitzer and Bayer (1999) pointed out that mind-sets have been analyzed primarily in terms of their cognitive features, whereby the effects of these features on the control of behavior were ignored. As an exception, they reported a study by Pösl (1994), who found that participants in the implemental mind-set were faster to initiate goal-directed behavior than those in the deliberative mind-set. The speed of action initiation, however, was moderated by how much conflict the participants experienced (i.e., whether they had a choice to perform Behavior A or B, or only one of these). Participants benefited from the implemental mind-set with regard to action initiation only when behavioral conflict was experienced. Apparently, the closed-mindedness associated with the implemental mind-set may have prevented planning individuals from starting deliberation of the behavioral alternatives. In the absence of a behavioral conflict, there may not have been any deliberation over alternatives, and thus no benefit of the implemental mind-set.

There is also evidence that the implemental mind-set generates greater persistence in goal-directed behavior. Brandstätter and Frank (2002) found that participants in the implemental mind-set persisted longer at an unsolvable puzzle task (Study 1) and at a self-paced computer task (Study 2). Similar to the findings of Pösl (1994), however, the impact of the implemental mind-set on persistence was present only in situations of behavioral conflict. When both the perceived feasibility and desirability of the tasks were either uniformly high or low, persistence on the persistence tasks did not differ by mind-set. However, when the perceived feasibility and desirability of the tasks were in opposite directions (i.e., one was high whereas the other was low), the implemental mind-set participants persisted longer than did the deliberative mind-set participants. This suggests that the mind-set associated with planning benefits the individual not only with facilitating action initiation but also with greater persistence in the face of obstacles. It should be noted, however, that persistence in the implemental mind-set is not executed insensitively or in a blind fashion. Brandstätter and Frank (2002, Study 3) also obtained evidence that when a task is perceived as impossible or when persistence is not beneficial, individuals in the implemental mind-set disengage much more quickly than individuals in the deliberative mind-set. Of importance, persistence associated with the implemental mind-set thus seems flexible and adaptive, and not stubborn and self-defeating.

Finally, Armor and Taylor (2003) reported an experiment demonstrating that an implemental mind-set facilitates task performance (a scavenger hunt to be performed on campus) as compared with a deliberative mind-set, and that this effect is mediated by the cognitive features of the implemental mind-set (e.g., enhanced self-efficacy, optimistic outcome expectations, perceiving the task as easy). Such a study had been missing so far. Note that the Gollwitzer and Kinney (1989) study predicted cognitive changes (i.e., strong illusions of control) as a consequence of the implemental as compared with the deliberative mind-set, because such illusions should benefit acting on the goal. However, this inference had not been tested within one and the same study as was done by Armor and Taylor.

Summary

The recent research on deliberative and implemental mind-sets nicely demonstrates that inducing implemental and deliberative mind-sets activates cognitive procedures that facilitate the task at hand (i.e., effectively meeting goals vs. making reasonable goal decisions, respectively). As mind-set researchers commonly induce the mind-sets in one situational context and assess their cognitive and behavioral consequences in a different setting, the research participants are unaware of the mind-set effects they evidence. It seems appropriate, therefore, to understand deliberative and implemental mind-set effects in terms of procedural priming or mind-set priming (Bargh & Chartrand, 2000).

Conclusion

Did Ron Kinney and I know at the time we submitted our manuscript for publication that we had produced a very special article? (Ron Kinney then was a master's degree student at the University of Munich, and it was his first experience with conducting empirical research.) Well, we knew that our studies had a bunch of nice features (see Susan Fiske's list of criteria, this issue): The findings are provocative in showing that the accuracy of people's control judgments can be varied easily by simple mind-set manipulations. The findings also have the important applied implication that people can use deliberative and implemental mind-sets to help them make reasonable decisions and effectively meet their chosen goals. Also, the ideas underlying the studies are based on lots of well-rounded

theory on the distinction between motivation and volition, as well as the concept of mind-set. Moreover, the independent variables are simple and easy to induce, and the important dependent variable of illusion of control is assessed in a very precise and elegant way. Finally, we felt that the spirit of the time was moving toward analyzing issues of self-regulation and that using priming procedures had started to become chic.

Still, we felt ambivalent and uncertain about whether we had produced an excellent piece of work. But then we received the reviews, and there was one review that was only full of compliments pointing to the novelty of the ideas, the many theoretical and applied implications, the beauty of the experiments, and so forth. There was not one request to change anything, but the suggestion to publish the manuscript as is. At this point, we were convinced that this was a special set of studies, and even more important, it motivated us to continue mind-set research. I am very thankful to this reviewer, and to the many colleagues I have cited in this article, particularly to those who have picked up mind-set research and improved it with their innovative theoretical and empirical input.

Note

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