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The Psychological Actions and Entrepreneurial Success: An Action Theory Approach¹

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This chapter starts with a strong assumption: Entrepreneurs' actions are important and should be a starting point for theorizing in entrepreneurship (cf. also McCullen & Shephard, 2006). I am well aware that not all entrepreneurship theorists share this assumption. Most importantly, ecological theories have left out actions from their theories (Aldrich, 1999). This is surprising for an evolutionary approach because entrepreneurial actions are as important to entrepreneurial outcomes as sexual behavior is to procreation and, therefore, survival of genes and population of genes (Dawkins, 1976). Whether or not an organization occupies a successful niche or whether or not it introduced an innovation is the result of actions and not a purely accidental process. Starting one's business in a market niche and defending the niche is an active process and not passive adaptation. Such an active approach is slowly accepted in entrepreneurship research, as scholars take more seriously that there can be effective and non-effective actions vis-à-vis the market (McMullen & Shephard, 2006; Sarasvathy, 2001). Most actions are geared towards the environment and take into account environmental conditions. However, the most important feature of entrepreneurial action is not that it is well adjusted to environmental conditions (this is true of behavior that reacts to environmental stimuli and is guided by the stimuli) but that it changes the environment.

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In contrast to most other animals, humans are particularly active, as they intervene in the course of nature (e.g., by building scientific models, houses, cities, dams, etc., that change our environment dramatically) and even in the course of their own natural evolution (e.g., producing spectacles and thereby compensating for the biological weakness of shortsightedness; Dolgin, 1985; Schurig, 1985).

Thus, I assume that actions by the entrepreneur make a difference for whether or not an organization sees the light of day and/or whether an entrepreneurial unit becomes successful. Our arguments are in line with the so-called Austrian school of economics (cf. Kirzner, 2001; Von Mises, 1963), as well as Schumpeter's theory of entrepreneurship (Schumpeter, 1935). For Schumpeter, the very hallmark of entrepreneurship was the active approach of the entrepreneur.

The purpose of this chapter is to present a psychological theory of action regulation (which has been developed independently from entrepreneurship research) and to apply it to entrepreneurship. We think that such a theory of action is of particular importance for entrepreneurship research because the nature of entrepreneurship is to proactively produce effective solutions to problems and opportunities (Saravathy, 2001; Shane & Venkataraman, 2000). Our theory is based on the so-called action theory or action regulation theory (Frese & Sabini, 1985; Frese & Zapf, 1994; Hacker, 1998; G. A. Miller, Galanter, & Pribram, 1960). Briefly, action theory is a meta-theory that attempts to understand how people regulate their actions to achieve goals actively and how this is done both in routine situations as well as in novel situations. Because it is a molar theory (similar to Lewin's theory), it is a theory that can be applied quite well. As the theory of action regulation is a meta-theory (such as behaviorism or psychoanalysis), much of its "charm" is based on its integrative function. However, we also use action theory as a specific theory that explains certain phenomena, such as psychological action strategies or failures and errors by entrepreneurs. Moreover, it is a theory that is easily applicable and that makes it possible to deduce interventions. Action regulation theory as described here is an individualistic theory. Obviously this theory applies more to the first stages of the development of a firm in which entrepreneurs as individuals largely influence what is happening in their firms. At a later point in the life cycle of a firm, an individual perspective is much less useful, as the entrepreneurial actions are largely leadership actions aimed at improving and aligning the actions of the firms' employees (Van Gelderen, Frese, & Thurik, 2000). In principle, these actions can also be described with the theory, but this is not in the foreground of this chapter (e.g., Tschan, 2002).

In the course of this article, we first describe the building blocks of this theory in a rather abstract way; we then show its integrative function and

its function of hypothesis development and research approaches in a few areas of entrepreneurship.

ACTION THEORY—BUILDING BLOCKS

Action is goal-oriented behavior (Frese & Sabini, 1985). Three aspects stand in the foreground to understand how humans regulate their actions: sequence, structure, and focus. Sequence refers to how actions unfold, structure involves levels of regulation, and the focus of an action can be the task, the social context in which the task is done, and the self. Every action can be decomposed into these three components of actions, and therefore a full understanding of entrepreneurs' action has to take all those aspects into consideration.

Sequence

The following steps of the action sequence can be minimally differentiated (cf. Fig. 8.1): goal setting, mapping of the environment, planning, monitoring of the execution, and feedback processing (Frese & Zapf, 1994; cf. also Dörner & Schaub, 1994; Norman, 1986). For the entrepreneurial process this means that a would-be entrepreneur has the goal to found a firm (or *not* to work as an employee), maps out the area in which the firm is supposed to operate (opportunity detection may be one facet), plans how to achieve this goal, monitors the process of executing these ideas, and processes feedback from (potential) customers, banks, business angels, the public, and so on.

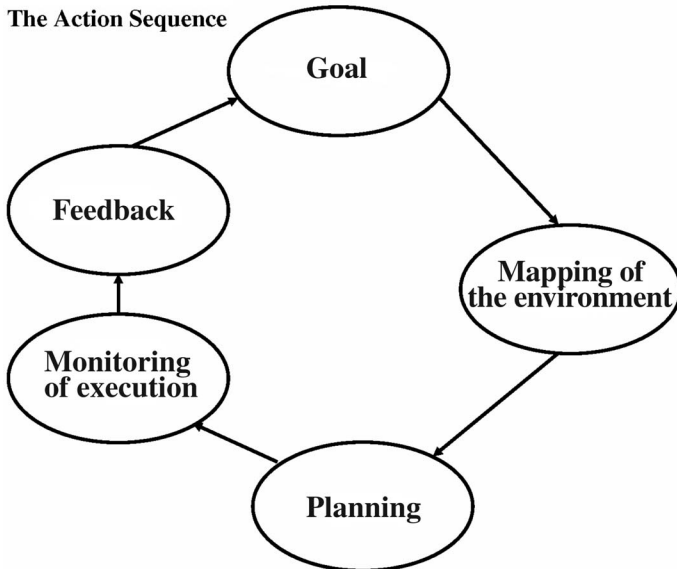


Figure 8.1. The Action Sequence.

Goals

Action is goal-oriented behavior; therefore, goals are of primary importance for actions (Locke & Latham, 1990). Goals are anticipated future action results and they are used as set points (Hacker, 1985). Goals pull the action; therefore, higher goals usually have a higher pull and therefore lead to higher performance (Locke & Latham, 1990). Anticipated results can be visualized and thereby produce motivation (e.g., to sell the first product). A better visualization of a goal probably has a higher pull function and probably leads to higher commitment. One way to develop a clear idea and visualization of a goal is to specify the goal in detail; this has been emphasized in goal setting theory (Locke & Latham, 1990).

Empirical work has differentiated three principal ways in which people think about their goals (Oettingen, Hoenig, & Gollwitzer, 2000). One way is to fantasize about how good it would be to having achieved the goal; another is to worry about not achieving the goal, and a third one is to contrast the goal with the current condition. Although fantasizing about goal achievement and worrying reduce the chances to achieve the goal, contrasting the positive goal fantasies with the current condition is most effective for high achievement (Oettingen et al., 2000). It follows that (would-be) entrepreneurs who mainly fantasize or mainly worry about their goal achievement are less likely to either start a firm or be successful.

A goal can only function as a motivator for performance, if it has regulatory power over the action (Semmer & Frese, 1985). With Heckhausen and Kuhl (1985), we call ineffective goals *wishes*. A wish is something that a person would like to achieve, but he or she is not (yet) doing anything about it. Sometimes, wanting to start a company may not get translated into action (as a matter of fact, there are many “nascent entrepreneurs” who never really start a company; Reynolds, 2000), and frequently owners are happy to talk about “goals” that really do not regulate their behavior. However, goals can be *developed* from wishes. Heckhausen and Kuhl (1985) argued that the factors represented by the acronym OTIUM (opportunity for action, time to do something about it, importance of the goal, urgency of achieving the goal, and means to be able to achieve the goal) are important parameters that produce the translation of a wish into a goal.

Goals can be associated with a higher or lower commitment (Hollenbeck & Klein, 1987). Higher goal commitment leads to higher goal strivings (Locke & Latham, 1990). If goal commitment is high, owners are more likely satisfied with their situation (Maier & Brunstein, 2001).

People usually pursue several goals at once. Some of these goals may be hierarchically related (e.g., starting a firm and getting money to get the patent rights for an invention), some other ones are not related (e.g., planning a leisure time event for a day off and working on a business plan), and some

may be conflicting and need to be compromised or in some way negotiated (e.g., helping a specific employee and making sure that there is equitable treatment for all employees). Goals are organized into hierarchies (more on the concept of hierarchy later). This does not mean, however, that we always pay attention to the full hierarchy. As a matter of fact, higher level goals, such as life goals and moral standards, are typically not in the foreground of our attention. Because our working memory has a limited capacity (Kahneman, 1973), we can only attend to those goals that are of immediate action relevance. Long-range life goals are typically of less action relevance than those directly related to daily life. Humans are action-oriented animals. Therefore, intermediate goals are in the foreground of our attention. This is one of the reasons why time management techniques teach people to attend to the important long-range rather than just the urgent short-range goals (Macan, 1996). This leads to the interesting hypothesis that long-range goals often have less regulatory power than short- or medium-range goals even if they are deemed to be more important. Moreover, contradictions between medium-range goals and long-range goals are not always detected.

Recently, social psychology has argued that there are two types of goals: goals to achieve something (promotion focused) and goals to prevent something (prevention focused) (Higgins, 1997). There are a number of ramifications of this differentiation. Prevention-focused goals are more anxiety related; the strategy that is pursued is more of avoiding things than to achieve certain things. Combining this with risk taking as described by prospect theory (Kahneman, Slovic, & Tversky, 1982) leads to the interesting hypothesis that anxious owners may take more risks. In contrast, promotion-focused owners who are more strongly oriented toward achieving positive goals (e.g., combining a hobby with starting a firm) are less anxious and take less risks (cf. Baron, 2004).

Mapping of the Environment

Owners have to know the environment or acquire knowledge of the environment in which they (plan to) operate. There is a large literature on mental models in cognitive psychology that has looked at how people understand their environment (Gentner & Stevens, 1983). The following issues are of importance: (a) realism of mental model, (b) broad signal inventory, including opportunity recognition and the function of quick detection of complex signals (chunking), (c) developing a map of the environment that has operative value, and (d) the right level of decomposition to understand an environment.

There is an interesting debate as to the functionality of realism: Some argue that people are more motivated and persistent if they are more optimis-

tic than objectively called for (Taylor, 1989). On the other hand, people may be overoptimistic, which may lead to wrong decisions and negative effects (Vancouver, Thompson, & Williams, 2001). Even venture capitalists are overconfident in the likelihood of success of business ventures that they give money to (Zacharakis & Shepherd, 2001). This may be particularly important in dynamic environments, which punish wishful thinking (Fenton-O'Creevy, Nicholson, Soane, & Willman, 2005). However, a recent publication suggests that optimism may vary at different points of time in the action sequence. Illusions of optimism were lower in a preactional state, before one has developed an action plan or has started acting, whereas illusionary optimism was higher once a person actually started to act to achieve a certain goal (Taylor & Gollwitzer, 1995), protecting the action from perturbing thoughts. In addition, there is evidence that interpretations of the environment are often self-serving (Crocker & Park, 2004) and related to cognitive biases (Shaver & Scott, 1991).

Experts usually have a broader inventory of signals that tell them which kinds of actions are called for in which situations. Signals are developed through a process of prototyping, which is often tacit and without conscious awareness. With experience, we tend to develop an average concept of similar situations—a so-called prototype (Glass & Holyoak, 1986). Also, with experience, we tend to grasp complex patterns more quickly—expertise research suggests that this so-called chunking helps to understand complex signals faster, which also tends to facilitate high performance (Chase & Simon, 1973; G. A. Miller, 1956). Because experts are faster in detecting complex signals (chunking) and have a larger inventory of signals, we can hypothesize that experts actually take less time analyzing environmental factors but that they still develop more adequate ideas about this environment. Therefore, it follows that expert entrepreneurs would understand complex situations more rapidly and more adequately than nonexpert entrepreneurs. However, it is not easy to know what an expert entrepreneur is. Some have suggested that repeat entrepreneurs (who have started several firms) are experts; however, simple repetition does not seem to produce expert status—rather, the breadth and depth of experience are important for expertise (Sonnentag, 1998). This implies that those entrepreneurs who have a high breadth of experience in various areas of relevance for entrepreneurship should have more economic success than novice entrepreneurs.

The mapping of the environment has to have operative value. Not every mental model is action oriented (Gentner & Stevens, 1983). Abstract and general mental models may be unrelated to one's actions. Action theory assumes that only action-oriented knowledge is useful for entrepreneurs. Mapping is as often the result of action (experimentation) and the feedback the actor receives as a result of that action. Thus, we do not really

get to know an environment without acting on the environment. Moreover, action orientation implies that mapping ought to be parsimonious, that people sometimes jump to action prematurely, and that the model is sketchy. As a matter of fact, experts regard problem analysis as highly important and they emphasize the importance. However, they do not necessarily spend much time getting oriented, because they can quickly get the most relevant information and are able to differentiate important from non-important and are, therefore, more quickly ready for action (Sonnentag, 1998; Sonnentag & Kleine, 2000). As environments are often dynamic and their factors are interrelated, better mental models are able to adequately predict future states of the environment from a limited set of predictors (Dörner, 1996). Action orientation is also an individual difference variable that is related to performance in various fields (Diefendorff, 2004).

Entrepreneurs need to map an environment on the right level of decomposition (Dörner, 1996). For example, entrepreneurs sometimes experience the environment as one that emphasizes only good inventions but do not perceive the importance of marketing. Marketing typically operates on a different level of decomposition than inventions (the level of perceived needs by market participants rather than the newness of the invention). One of the functions of good entrepreneurship is that different levels of decomposition are taken into account and it may be one of the most important competencies of entrepreneurs to be able to think on these different levels of decomposition—a competency that has not been studied (cf. chap. 4 by Markman, this volume).

Plans

For G. A. Miller et al. (1960), plans are the bridges between thoughts and actions as they transfer a goal into executable sequences of operations. Plans order the sequence of operations that need to be performed (G. A. Miller et al., 1960). Plans (or action programs) are not to be confused with their everyday meaning; the latter often implies plans that include relatively elaborate blueprints. Entrepreneurship research often uses planning in the sense of formalized plans of business plans or strategic plans. We go beyond formal planning (e.g., Schwenk & Shrader, 1993) in our approach. We think of plans in the psychological sense that one has some kind of order of operations for the next few seconds, minutes, months, or years. Some plans are relatively elaborate, some others just consists of a general idea of how to proceed, and finally some plans are automatized schemata or frames (e.g., for talking to a customer; cf. G. A. Miller et al., 1960). The detailedness of plans may differ. Some plans stipulate many aspects of operations before one starts the action (detailed planning); other plans develop the details

during the execution phase (nondetailed planning) (Frese, Stewart, & Hannover, 1987). Detailed planning also includes backup plans in case something goes wrong. This form of planning may be particularly useful in uncertain environments (Honig, 2004). Some plans are related to events in the long-term future, whereas other plans deal only with imminent actions (long-term vs. short term-orientation) (Frese et al., 1987).

Action theory suggests that planning should help owners to be successful. Planning increases the likelihood that people get started by translating their goals into actions and mobilizes extra effort. As Gollwitzer (1996) showed, a plan leads to an implementation intention and to a higher degree of checking the environment for opportunities to be able to achieve a goal. It follows from this theory that planning may be one of the more important factors to recognize entrepreneurial opportunities and to take advantage of them (without a plan, we would not automatically recognize relevant signals for actions in our environment—but remember, this is not a formal plan). Planning helps a person to stay on track and ensures that the goal is not lost or forgotten (Gollwitzer, 1996). Planning also amplifies persistence or decreases distraction (Diefendorff & Lord, 2004). Moreover, planning produces better knowledge of contingency conditions and time allocation to tasks, and leads to a clearer focus on priorities (Tripoli, 1998). It follows that entrepreneurs, who plan less, will get distracted more from their goals and they will have a lower focus on important issues. Planning usually involves thinking of things that might go wrong. Planning motivates the owners to deal with additional problems, and prepares them to have a ready-made answer if something goes wrong; therefore, actions run more smoothly (Berg, Strough, Calderone, Meegan, & Sansone, 1997). Planning allows the person to cope with the inherent insecurities of being a business owner by making good use of scarce resources (Rauch & Frese, 1998). Finally, there is also the problem of premature actions, which are made less likely if the owner plans well, because planning makes premature triggering of an action less likely (Kuhl & Kazen, 1999). One of the most important success factors of planning may be that planning leads to better feedback systems and that people who plan better gain flexibility because they detect changing circumstances and adjust their actions appropriately (contingency planning) (cf. also Scott & Delmar, 2004).

It follows from action theory that more successful entrepreneurs have more ready-made plans available. That may lead to the paradoxical result that effective entrepreneurs actually plan less at any given moment, because they already have plans available that have been stored in memory some time ago. Because action plans can be conscious or unconscious, owners may actually tell an observer that they do not consciously plan at all and that they just follow intuition, when they actually follow previously routinized plans of action (more on this later).

Planning is not free of costs. The more conscious planning is and the more formalized it is (writing it down, using certain planning techniques, etc.) and the more one thinks about long-term future events, the higher are the costs in terms of time (and sometimes money). Another important cost is that owners tend to stick to plans, which implies a certain amount of rigidity. It follows that there are certain situations where planning may be dysfunctional, for example, chaotic situations in which every prediction turns out to be wrong (however, note that slightly chaotic situations actually require more planning, because one needs to take potential problems into account—contingency planning and a plan B). Another prediction from action theory is that people can learn to put flexibility into the plan (more contingency planning, more flexibility to replan when ones plans did not work out); we assume that training for flexibility (importance of being flexible), and the development of expertise as a result of having acted in heterogeneous situations with very different types of plans (Sonnentag, 1998) may be important factors that contribute to flexibility.

Monitoring of the Execution

Actually, the concept of *plan* already implies execution—it is the bridge between cognition and action (G. A. Miller et al., 1960). Nevertheless, we sometimes store plans in a sort of pipeline waiting to be called upon. In these cases, one can distinguish a phase called *executing*. Monitoring of execution draws heavily on the working memory processes; therefore, omission errors appear here (Reason, 1997). Important parameters in this execution phase are speed, flexibility, whether or not plans are coordinated with others, and whether one uses a time-sharing overlapping plan execution mode or not. Because working memory is so important in the monitoring phase, the question is how to overcome its limitations. The most important strategy is to chunk several issues into one bit of information (G. A. Miller, 1956).

Feedback

Without feedback one would not know where one stands with regard to a goal (Erez, 1977; Locke & Latham, 1990; G. A. Miller et al., 1960). On the other hand, feedback may trigger self-related thoughts and thereby divert attention from the task, actually producing negative performance effects (Kluger & DeNisi, 1996). Important parameters with regard to feedback are process vs. outcome feedback, the degree of realism versus self-serving interpretations (Dörner & Schaub, 1994), feedback search rate, and how active this search for feedback is (Ashford, 1989). It is one of the assumptions in economics that small firms are faster to process and to react to feedback

than larger firms (Chen & Hambrick, 1995) because information processing is faster in small organizations due to lack of complicated hierarchical procedures. However, one of the prerequisites of this hypothesis is that the small firm owner actually recognizes the significance of the feedback signal (mental model) and that he or she finds the right response to this feedback. We also assume that feedback increases the rate of learning of firm owners, at least if the feedback comes from the task itself and if it does not involve too many self-related thoughts (Kluger & DeNisi, 1996).

It is commonplace to talk about entrepreneurs' need to deal with situations of high complexity and little predictability. This implies that feedback needs to be actively constructed and is not "out there." Complex feedback needs to be interpreted. Take the example of a chef who owns a restaurant and who notices that the income of the restaurant is slowly decreasing. It is a matter of interpretation whether he is alarmed by this feedback or whether he interprets this to be "just one of those months." When he is alarmed he has to seek feedback actively (Ashford & Tsui, 1991)—for example, by asking for customer feedback, by analyzing leftovers on the plate for changes in taste, by analyzing the amount of expensive or inexpensive wine bottles ordered for changes in income available for restaurants, by analyzing the composition of his customers in terms of age, dress, and so on. Only this process of active feedback seeking and construction will lead to adequate strategies to deal with the problems of this restaurant owner.

Unpredictability of feedback (and events) can be differentiated into unpredictability of when or under what circumstances an event will occur, what kind of event will occur, or whether a certain event will occur at all (S. Miller, 1981). Entrepreneurs may not be able to predict any of these events and feedbacks and, therefore, have to be prepared.

Action theory maintains that the most useful feedback is probably negative feedback, because it accentuates the fact that the actor has not yet achieved the goal (Frese & Zapf, 1994). Positive feedback—the goals have been achieved—may have motivational function to do a certain action again, but little learning occurs. In contrast, under negative feedback conditions, a high amount of learning occurs under certain circumstances (we talk about that later in this chapter).

The Interplay of the Steps in the Action Sequence

The action steps are not as regular as the description just given and Fig. 8.1 may suggest. Actions are inherently messy and do not always follow a neat sequence. People sometimes rethink their goals after they develop some action plans; they invariably go back and forth between starting an action and rethinking plans and doing some more search in the environment. Thus, we do not want to suggest that the sequence is invariable; however, we believe

that every one of the steps is necessary for effective actions, and if one of the steps is missing, actions will become incomplete and inefficient (or outright impossible). A case in point is that actions without feedback lead to disarray (G. A. Miller et al., 1960). Similarly, there must be goal setting and some kind of planning in actions. Although planning and subgoaling are sometimes equated, there is a function of planning that does not exist in producing subgoals: Planning implies that entrepreneurs do a mental simulation of their actions (“*Probehandlung*”).

One set of evidence for the differential importance of goal setting and planning comes from the Rubicon theory (Gollwitzer, Heckhausen, & Ratajczak, 1990; Heckhausen, 1987). Different processes exist before one crosses the Rubicon and afterward. It is planning that makes people cross the Rubicon (the Rubicon concept was named after the famous quote from Cesar that “the dice have fallen” after he had traversed the river Rubicon—he implied that one cannot go back on one’s decision after one has started to act). Before crossing the Rubicon, the intention is developed within a rational decision-making model of goal choice. Once people plan (i.e., think about when and how to put an intention into action), the intention is transformed into an implementation intention. Once an implementation intention is formed, the Rubicon is traversed and the person is then in the phase of willing. Here automatic processes may take over to push the person into action (Gollwitzer, 1993).

One important implication of this theory is that rational processes of understanding a situation and setting one’s goals are dominant before the Rubicon; thus, we can understand owners in this phase with rational choice models quite well (e.g., valence–expectancy–instrumentality models; Vroom, 1964). Once an owner has crossed the Rubicon, psychological processes change. Then the owner is less likely to ask whether or not a certain goal is useful—scrutinizing and analyzing the goal is unlikely to happen in this phase. People in this phase are implementation oriented and just want to achieve the goal. Therefore, in this phase, owners often become unrealistic (Gollwitzer, 1993). New information is only registered if it helps to achieve the goal; in contrast, new information is not taken up and used well if it could call into question whether or not the goal was useful in the first place. The phenomenon of escalation of commitment—throwing good money after bad money (Staw & Ross, 1987)—and the development of rigid strategies under threat (threat-rigidity phenomenon; Staw, Sandelands, & Dutton, 1981) can be explained by this theory. Instead of a cool analysis of the pros and cons, information processing in the willing phase is only used to support actions to overcome barriers and problems. In this phase, difficulties and barriers of goal achievement increase the motivation (in contrast to the phase before the Rubicon, where high difficulties may lead to giving up

the goal): The more difficulties turn up after the Rubicon, the more owners develop the will to overcome them.

Action regulation theory may be combined with the approach by McMullen and Shephard (2006), which puts actions into the center of the theory. McMullen and Shephard (2006) argue that entrepreneurial actions are always done under uncertainty (perceived uncertainty and willingness to bear uncertainty). From an action regulation theory perspective, we would argue that there are uncertainties for every step of the action sequences and that in each case, uncertainty means something different—uncertainty with regard to an action goal implies that there is uncertainty between a goal and further long-term goals of the entrepreneur. Uncertainty with regard to mapping the environment may be related to the complexity of the situation; uncertainty with regard to the plans related to how uncertain it is that the plan will work out; and uncertainty with regard to feedback may be uncertainty on whether one gets the feedback, when one gets it, or which kind of feedback one is likely to get.

ACTION STRUCTURE

The action structure is concerned with the hierarchical cognitive regulation of behavior. The structure constitutes a sort of “grammar” for action. The notion of hierarchy is needed to understand well-organized behaviors that achieve higher level goals (e.g., launching a new product) by using lower level behaviors (e.g., uttering a sentence, typing a word, or using the appropriate muscles to strike a key) (cf. Carver & Scheier, 1982; G. A. Miller et al., 1960). The higher levels of the hierarchy of action regulation are conscious, thought oriented, and more general; the lower levels consist of routines; they are specific; and they frequently involve muscle movements. This hierarchy is not neatly organized but has potential reversals. Such a reversal is most pronounced in the example of a capture error (Norman, 1981); a routine takes over and leads to action errors (as in the example that someone wants to buy bread on the way home but the routine of going home takes over and he or she finds him- or herself at home without bread). Therefore, we call this hierarchy a *weak hierarchy* (with Turvey, 1977).

The Four Levels of Regulation

We differentiate three task-oriented levels of regulation and one metacognitive level.

The Skill Level of Regulation. The lowest level of regulation (called skill level, by Rasmussen, 1982; sensorimotor level of regulation, by Hacker,

1998; psychomotor, by Ackerman, 1988; automatized, by Shiffrin & Schneider, 1977; or procedural knowledge, by Anderson, 1983) regulates situationally specific automatized or routinized skills. Information on this level is parallel, rapid, effortless, and without apparent limitations. However, it is difficult to substantially modify action programs. In order to change them, they have to be lifted to a higher level of regulation, so that some conscious form of (effortful) processing can be applied. The skill level of regulation is the preferred level of regulation (March & Simon, 1958), particularly when there is high load (Kahneman, 2003).

Level of Flexible Action Patterns. Well-trained schematic action patterns (Norman, 1981) dominate here. These ready-made action programs are available in memory but must be flexibly adjusted to situationally defined parameters. Perceptual processes of action signals are important here (Ackerman, 1988; Hacker, 1998). The two—skill level and level of flexible action patterns—are often subsumed under the term of mindlessness (Fiol & O'Connor, 2003).

Conscious Level. This level is concerned with conscious regulation of goal oriented behavior (variously called “knowledge based,” by Rasmussen, 1982; “declarative knowledge,” by Anderson, 1983; “controlled,” by Shiffrin & Schneider, 1977; “cognitive,” by Ackerman, 1992; “intellectual level,” by Hacker, 1998, and Frese & Zapf, 1994; or “system 2 reasoning,” by Kahneman, 2003). Although the term *consciousness* has had a checkered history in psychology, it seems to be a good umbrella term to mean that people are aware of how they go about a certain action (or are aware of the important parameters of the action). Consciousness or awareness does not necessarily imply that a thought is verbalizable but can also mean that a person can image it—in the sense of a vivid thought that is simulating a certain action (e.g., mental simulation; Shephard & Metzler, 1971). Conscious processing implies effort (Kahneman, 1973); it is slow, it is constrained by limited resources of the central (conscious working memory) processor (Baddeley, 1986), and it works in a serial mode. These are the task-oriented levels of regulation.

Level of Metacognitive Heuristics. We do not have only conscious strategies to deal with the world; we also have some knowledge on how we ourselves use these strategies (knowledge about our cognitive regulation; cf. Brown, 1987). Moreover, people self-reflect about how they go about their actions (Brown, 1987). The issue of metacognition has been studied in training (Ford, Smith, Weissbein, Gully, & Salas, 1998; Keith & Frese, 2005). People often know how much they will be able to learn (Metcalf, 1993), what they do not know (Kruger & Dunning, 1999), and what kind of strate-

gies they use (Gleitman, 1985; Weinert & Kluwe, 1987). Metacognitive heuristics are also related to the steps of the action sequence discussed above; people have general heuristics of how they set goals, get information, plan, monitor, and process feedback (Frese et al., 1987). These general heuristics can be processed either consciously or automatically (Brown, 1987; Flavell, 1987), and they may be highly generalized or specific. Generalized and automatic heuristics with regard to action regulation are called *action styles* and function as equivalents to personality traits (Frese et al., 1987). They affect directly how one regulates actions on the conscious level of regulation (cf. also Busenitz & Arthurs, chap. 7, this volume).

The highest level—the meta-level—is usually not implicated when we receive an outside task for which some solution is known. Because these types of tasks dominate our working life, this is one reason why we typically do not think about our life goals, moral issues, or general procedures of how we deal with things, in our everyday activities.

Automaticity and the Levels of Regulation. Routines are developed when the environment is redundant and when satisfactory results can be achieved with the routine. With practice, automatization is achieved (an overlearning process). Experts have more routines than novices. Whenever possible, lower levels of regulation are preferred because processing on this level is less effortful and the action is smoother. Another advantage is that the higher levels of regulation are freed from the constraints on working memory and are free to do other things (e.g., scan the environment for opportunities to satisfy other goals, or to preparatorily solve a problem that might appear in the future or to do pleasurable things like daydreaming).

Routines do not only develop for sensorimotor acts but also for thoughts. The use of theories can be such a routinized skill. For example, people raised in the tradition of the ecological theory of entrepreneurship will automatically think about the importance of environmental issues. This is one reason why theories have a life of their own and it is difficult (and effortful) to change them. The automatic use of the theory presents an impulse to the person on how he or she should orient him- or herself with regard to a scientific question.

Because routines are developed in redundant environments, expectations are high that is possible to use one's routines. Frustration appears when the lower level routines cannot be used (Amsel, 1958). People react negatively when their usual routines do not work any longer. Moreover, people are motivated to reestablish the routine (a sort of reactance effect; Wicklund 1974).

Keeping routines makes people conservative (therefore, older firms with established routines are more conservative than newer firms). People have a tendency to stick to their routines, even against a certain amount of

environmental pressure. This goes for thought routines (e.g., using a certain theory and keeping this theory even when there are actually better alternatives available) as well as for sensorimotor routines (e.g., use a certain approach to selling that is kept up even though better alternatives are available). Therefore, entrepreneurs who have done well in the past may have problems when the environment changes, when continuous improvement is necessary, when innovations have to be speedily implemented (e.g., “not-invented-here-syndrome”), or when team composition is changed quickly (e.g., in project work) (Audia, Locke, & Smith, 2000).

On the other hand, if only routine actions are driven (thus, the higher levels of regulation are under occupied), boredom ensues. However, boredom does not necessarily lead to higher level processing on a particular task. Rather the higher levels are then in search of some other tasks. This may lead to daydreaming or to radical changes (e.g., founding a new company). Thus, if routines get interrupted, people react with negative emotions, but if people’s actions are reduced only to routines there are negative effects (Hacker, 1998), as well.

The activities of entrepreneurs are of high complexity and they often have to act within unknown and unpredictable environments. Therefore, entrepreneurs will tend to need to regulate more tasks on the conscious level of regulation than other occupations. Because new tasks appear for entrepreneurs again and again as the firm unfolds, conscious regulation of action is likely to be important for several years in contrast to most other jobs. From this follow a number of interesting implications: First, cognitive ability should be more important for entrepreneurs than for other occupations (note, however, that there may be reduced variance in Western countries because of a selection effect—people low on cognitive ability do not usually become entrepreneurs or are selected out quickly). Because cognitive ability is a limiting factor of working memory and attention allocation and because conscious processing is done because new tasks appear frequently, entrepreneurs are required to use a large reservoir of cognitive resources (which is cognitive ability) (Ackerman, 1988). Second, entrepreneurs work under high cognitive load more frequently than people in other occupations (Baron, 1998); therefore, more errors in planning and feedback interpretation on a conscious level happen to entrepreneurs (Zapf, Brodbeck, Frese, Peters, & Prümper, 1992). Third, because of this overload, entrepreneurs may be tempted to prematurely delegate regulation to lower (less conscious) levels of regulation—one implication is that wrong actions may be routinized (e.g., in the area of leadership) that are difficult to break up later on. Finally, the learning curve will be steep for entrepreneurs.

Learning and the Hierarchy. Learning can take place in two ways. The first avenue is to learn something directly on the lower and unconscious levels of regulation—so-called tacit learning (Myers & Davids, 1993). The

second avenue is to first learn to perform an action consciously and with practice to transfer the regulation more and more to the lower levels of regulation. Consciousness does not imply that the action regulation can be verbalized—sometimes we can only visualize it consciously (e.g., when a person mentally simulates how to ride a bicycle). The second form of learning is the more efficient avenue because conscious regulation has the advantage that people learn principles of action as well and that a person can learn rapidly (cf. Kahneman, 2003, on a similar point). Such explicit knowledge can help to adjust one's skills more flexibly to changing circumstances than does tacit learning (Myers & Davids, 1993). Note, however, that both avenues of learning may take place at the same time: People adjust their behaviors that were once learned consciously to the specific circumstances on lower levels of regulation. The most obvious example of tacit learning is pattern recognition or prototyping (Posner & Keele, 1970). In the basic experiment, people look at a series of dots that are random variations of a prototype. Although the prototype itself is not shown, it is readily accessible and memory for it is particular good in comparison to the random variations that actually have been shown to the people. "Implicit knowledge is likely to develop in complex tasks containing many irrelevant variables but where key relationships are not obvious" (Myers & Davids, 1993, p. 127). Note, however, that categorization can also be done on a conscious level (Sloman, 1996).

Crossing Sequence and Structure

Some regulation theories are primarily concerned with the action sequence (Dörner & Schaub, 1994; Gollwitzer, 1993; Locke & Latham, 1990), and some other ones primarily with the action structure in terms of hierarchical regulation (Carver & Scheier, 1982; Lord & Levy, 1994). It makes sense to combine these two perspectives and cross action sequence and the levels of regulation (cf. Table 8.1). The dimension of consciousness reaches from nonconscious to conscious (similarly, the meta-level includes conscious and nonconscious processing). Goals, information mapping, plans, monitoring, and feedback processing are regulated based on knowledge from long-term memory (called *knowledge base* in Table 8.1).

Two interesting implications of crossing action structure and sequence are: Certain theories used in entrepreneurship research restrict themselves to processes on a conscious level of regulation, for example, expectancy \times value (Vroom, 1964) and choice theories (Naylor, Pritchard, & Ilgen, 1980). Further, as Ackerman (1988) has pointed out, predictors related to performance regulated on a high level may be related to cognitive ability, whereas lower levels may be less so. Cognitive ability is the limiting factor for the resources available to an individual when the tasks are processed con-

TABLE 8.1
A Model of Levels of Regulation and Structure

<i>Structure</i>	<i>Skill level</i>	<i>Level of flexible action pattern</i>	<i>Conscious level</i>	<i>Meta-level</i>	
Consciousness of regulation	Unconscious; normally no access to consciousness necessary	Access to consciousness possible, but not necessary	Conscious representation to heuristics	Both conscious and automatic use of heuristics	
Elements of the knowledge base	Movement-oriented schemata;	Flexible action schemata	Complex, problem-oriented knowledge base	Generalized heuristics, possibly automatized	
Sequence	Goals	Triggered, by higher level or situational cues	Subgoals	Goals	Standards and metagoals, life goals
Mapping	Orientation reflex of environment	Schema	Conscious, prognosis	How much knowledge necessary to feel equipped to act	
Action programs / plans	Blueprints of elementary movement patterns and cognitive routines	Well-known action patterns with situational specifications	Conscious complex plans, strategies	Metaplans, heuristics	
Feedback / signals	Stereotype test programs, unconscious processing of kinesthetic and pro-prioceptive feedback signals	Processing of known signals / feedback	Analysis and synthesis of new information	Abstract (nonobject-oriented) checks, logical inconsistencies, heuristics for feedback processing	

(Adapted from Frese & Zapf, 1994, p. 285)

sciously. Cognitive ability should have a stronger impact on those processes that are regulated on the conscious level and much less so on processes regulated on the skill level. Because in the beginning of a learning process more tasks need to be processed consciously, and because learning implies that people increasingly rely on routines, cognitive ability should have a more important effect on people in the beginning of their learning. Therefore, cognitive ability should predict the performance of entrepreneurs in their first years more than in later years or should predict better the performance of those entrepreneurs who operate in highly changing environments (with the demand on consciously dealing with those changes) than those in stable environments (Kanfer & Kantowitz, 2002).

The Relationship Between Upper and Lower Level Processing

Evidence for the differentiation of levels of regulation comes primarily from training studies and reaction time tasks (Shiffrin & Schneider, 1977). Ackerman (1988) showed that cognitive ability predicts performance better in the beginning of the training process (when processing is done consciously); perceptual speed is a good predictor in the middle (when processing is on the level of flexible action patterns); and psychomotor predictors are good at the end of the training (when the task is handled routinely).

The function of the higher levels of regulation is to give input into the lower levels. Lord and Levy (1994, p. 340) summarize this by arguing that "moving up one level explains *why* an action is done (to reduce discrepancies in higher-level systems), and moving down a level explains *how* discrepancies are reduced (by the operation of lower-level systems)." The input from a higher level may be a goal in a negative feedback loop (Carver & Scheier, 1982). Additional inputs on the higher levels may be triggering conditions (when should an action or operation be set into motion), selection of strategies of how to proceed, sensibilization for detecting certain feedback and signals, or protecting the action from interference (Hacker, 1985). Lord and Levy (1994) see the important function of higher level processes to guide attention and to protect the functioning of the lower levels from interference. In contrast, the lower levels should detect discrepancies and send information upwards.

Actions are regulated on a higher level when barriers, opportunities for new goals, or environmental pressures appear. *Barriers* are, for example, problems that are difficult to solve, errors, or an objective no-go situation. The consequence of moving up the level of regulation is that one is forced to think consciously about the problem. This may be frustrating because one's plans of action are interrupted (Mandler, 1964), but it can also lead to new conscious learning (Frese, 1995). *Opportunities* lead to a higher level regulation when they can satisfy current concerns (e.g., when an entrepreneur

talks to a customer and notices that there might be an opportunity present for additional work, he or she might start to think more consciously about these talks than when the conversation takes place as an everyday event). In such a case, people tend to focus consciously on the task and decide whether to finish it or to use the opportunity as a trigger of new actions. Sometimes entrepreneurs may develop routines to search for opportunities—for example, giving a business card to every potential new customer. But once an important new opportunity is detected, action processing is more likely conscious. Because conscious processing is limited by capacity levels of the conscious processor (Norman & Bobrow, 1975), new opportunity recognition should be easier for entrepreneurs who have been in business for some time (because they regulate most other things on a lower level of regulation) than for somebody who has just started a firm. But note that this tendency is offset by the tendency of entrepreneurs to stick to their routines once they are developed. Thus, with increasing routinization of work there are two processes taking place that have opposing effects on opportunity pursuit: On the one hand, as a cognitive process, people are, in principle, able to deal with additional demands (such as pursuit of new opportunities); on the other hand, motivationally, people feel comfortable to stick with their routines and are therefore less open to new ideas once they have developed their routines. Thus, cognitively people are able to see new ideas, but motivationally they are not necessarily open to them.

Environmental pressures can produce actions because people know that they have to do certain things (e.g., be friendly to a preferred customer is sometimes done with a conscious strategy). If environmental pressure makes it necessary to produce actions that are not well rehearsed, it is necessary to process these actions on a higher level of regulation. An example is writing a business plan—here the would-be owners are forced to consciously think about the plans of actions. Therefore, if environmental pressure is high, there are fewer differences of how people proceed with their actions than in situations where environmental pressure is lower.

Some scholars have argued that *mindfulness*—just another term for processing information on the conscious level of regulation—has mainly positive consequences (Fiol & O'Connor, 2003; Langer & Piper, 1987) for individuals and organizations. Although action theory shares the argument that processing is more thorough, realistic, and often more appropriate if done on higher levels of regulation, there is an important caveat: Entrepreneurs and organizations can only be mindful in their processing of a limited number of actions. If these actions are the important ones and if the environment is nonredundant, it pays off to be mindful, as long as other important issues are processed nonconsciously (i.e., mindless). If an entrepreneur attempted to be mindful for every action or operation, he or she would be incapacitated (e.g., hardly any sentence could be produced in a sales pitch, be-

cause of mindful attention to the grammar). Action theory also suggests that there are advantages to lower level (mindless) processing (mainly related to issues of load on the restricted processing capacity of higher levels of regulation; cf. Norman & Bobrow, 1975).

When moving up the level of regulation, certain problems appear: Higher level processing overloads processing capacity, and it is more difficult; the actions are less elegant and smooth. *Overload* is the direct result of having more things to do on the upper levels of regulation (Kahneman, 1973). Shifting to higher level processing is *difficult*; experts often report that to work against one's routines is more difficult, and earlier routines may interrupt the process and habit errors occur (Kimble & Perlmutter, 1970; Prümper, Zapf, Brodbeck, & Frese, 1990). Especially frustrating is the lower degree of performance *elegance* and *smoothness* when people are asked to consciously control routinized actions (Kimble & Perlmutter, 1970).

Learning can (and has to) take place on all levels of regulation; however, learning implies different things on different levels. Learning on the lowest level implies that one's skills are adjusted to the particulars of a situation and to increase the coordination of muscles and between different skills—skill execution become smoother and the various operations of the skills become better coordinated. Moreover, some motor skills or cognitive patterns, such as prototyping, are probably only learned on this level (Broadbent, 1977; Myers & Davids, 1993). However, learning on this level is highly situation specific and there is little transfer to other situations. In contrast, learning on the conscious level has high transfer potential because it is based on developing insights. Of course, even if learning is originally done on a high level of regulation, with practice the regulation of action moves downward so that less conscious attention is needed (Kanfer & Ackerman, 1989; Sloman, 1996).

An important corollary is the necessity to practice the relationship between the levels of regulation (Semmer & Frese, 1985). Not every conscious or abstract thought has regulatory power over one's actions. Only if thoughts are related to lower levels of regulation do thoughts control action. Therefore, it is necessary that a new insight is entrained to relate to action. Most people know that learning something new, for example, bookkeeping in a university course, does not imply that one is able to use it—some transfer (transfer with lower levels of regulation) needs to be done. Bookkeeping may well continue to be an abstract concept. The learner might be good at reproducing the knowledge on bookkeeping in a test, but this knowledge may still not have regulatory power, unless the entrepreneur has learned how to use it in specific practical situations. This can only be done by engaging all levels of regulation. Therefore, training and teaching have to involve all levels of regulation.

Another corollary to the preceding reasoning is that people may misunderstand their own action regulation. For example, entrepreneurs argue quite frequently that they decide things without much thought—in the sense of intuitive decision making. For action theory, intuition implies that the action (including a cognitive action) is regulated on lower levels. Intuition exists and may be efficient under these conditions: First, the entrepreneur has been in those situations before and routinized how to deal with them. Second, the deep-level characteristics of the situation must be the same as other situations that the entrepreneur has mastered before (sometimes the surface characteristics may be the same, but not the deep-level characteristics—this may lead to wrong decisions on the basis of intuition or routines [Adelson, 1984]). Third, the entrepreneur must know the right signals (or other cues) that tell him or her which kinds of actions are adequate in this situation. Finally, the entrepreneur must be skilled at using feedback on the lower level of regulation (which again implies prior exposure and practice with this feedback). It follows that whenever a new situation requires new decision making, intuition is probably bad advice.

Limits to Good Performance: Cognitive Misers, Satisficing Strategy, and Action Styles

Our discussion so far could be misunderstood as saying that there is an inherent tendency toward optimal performance (because people get feedback and improve their actions as a result of them). Any good theory must come to grips with the fact that there are limits to good performance and that there are people who do not learn quickly and well enough to deal with difficult situations. Psychologists have tended to argue against optimistic concepts in economics that allowed people to become highly knowledgeable participants in the market—the most important concept being “bounded rationality” (March & Simon, 1958). From an action theory view, five processes are responsible for continuous suboptimal performance: First, people are cognitive misers (Taylor, 1981). This means that they normally prefer to use automatic, stereotypical responses rather than to put high effort into goal analysis, orienting themselves fully, developing well-thought-out plans, or developing new feedback signals (Dörner, 1996; Fiol & O’Connor, 2003; Reither & Staeudel, 1985). High cognitive effort will only be used if there are good reasons to use it. Serious errors, difficult problems, obvious opportunities, and environmental pressures constitute good reasons. Actors use conscious, effortful approaches only if they assume that the routine responses do not function well (Frese & Zapf, 1994).

Second, a similar issue relates to the aspiration level of performance. As March and Simon (1958) noted, people most often use satisficing and not necessarily optimizing action strategies. This means that the “next best” so-

lution is preferred rather than an unknown optimal solution. Obviously, this puts limits on the development of high performance, and many modern organizational interventions are geared to increase the use of optimizing strategies (total quality management, lean production, etc.).

Third, suboptimal, subsatisficing performance may be kept up even against evidence because of the function of action styles (Frese et al., 1987). Action styles are automatic heuristics that regulate how we set goals, map our environment, plan, monitor, and process feedback. For example, some people tend to make precise and long-term plans even for actions that do not need to be planned out well. Others tend to do the opposite, even for actions that would certainly profit from a high degree of planfulness. Because these action styles are automatic and general (i.e., they apply to a wide variety of action areas), we do not typically think about them. Rather, whenever we get some specific feedback, we use a specific response and learn something rather specific. Thus, a person will say in a particularly case, "I should have known better, I should have really planned out in detail what I needed to do." Thus, for this specific problem, the person will have learned to use a higher degree of prior planning. However, with a somewhat different situation, this person will use the old approach of little planning. Thus, because people do not reconsider their general approach to, for example, planning, only specific instances are optimized, but generally suboptimal action styles are kept up. The problem of action styles is aggravated when people (like entrepreneurs) have many different tasks to do; this makes it unlikely that they spend enough time to develop nonroutine approach to problems. A similar argument can be made for regulatory focus, that is, whether people are promotion or prevention focused (Brockner, Higgins, & Low, 2004).

Fourth, environmental pressures often suggest a certain amount of urgency. In an urgent situation (e.g., signs of immediate danger), people use the first automatic or routinized approach that appears to be appropriate at first sight (Reason, 1990).

Fifth, heuristic processing produces fast results. However, under certain circumstances heuristic processing leads to negative effects—for example, if the task is not adjusted to the functioning of human beings. Famous examples imply heuristics in statistical reasoning (Kahneman et al., 1982) (cf. chap. 7 by Busenitz & Arthurs, this volume).

THE FOCUS: TASK, SOCIAL, AND SELF

Much of our discussion of entrepreneurial performance in this chapter assumed an individual task—thus, the focus on the task. This is certainly useful for small business owners who determine to a large extent what is happening in the firm, but it probably applies less and less as a firm grows. Achievement in work is often based on some sort of collective activities.

Therefore, high firm performance is based on how well the social and organizational context in which task performance takes place is regulated (cf. Borman & Motowidlo, 1993; Organ, 1988). In this case, the regulatory focus is the social context. A third focus of regulation can be the self, for example, in the sense of self-regulation or self-management (Bandura, 1997; Karoly, 1993). Thus, all of our concepts developed can be applicable for regulating with the three foci of performance—the task, the social context, and the self.

The Task as Focus of Regulation

The task as focus of regulation has been discussed at length and does not need to be repeated here. It is of obvious importance and any diversion from the task probably leads to lower success. As a matter of fact, the problems of neuroticism may lie in its effect of diverting attention away from the task to one's individual anxieties (Judge, Higgins, Thoresen, & Barrick, 1999). An interesting finding in the expertise literature shows that experts and nonexperts alike may get diverted from the task, but experts are more quickly task oriented again than nonexperts (Sonnentag, 1998).

The Social Context as Focus of Regulation

Entrepreneurship is a social endeavor—as a matter of fact, starting an organization is per se a social endeavor because it implies that other people are involved. Therefore, to be successful, entrepreneurs have to regulate the social contexts of task performance. The following are important mechanisms of why a social focus is important (Organ, 1988):

1. The entrepreneur needs to hold up the smooth functioning of the organization.
2. Sometimes employees need help and support to work well (Borman & Motowidlo, 1993).
3. The technical and production equipment has to be kept up and serviced. This implies that production methods have to be continually improved.
4. Organizational objectives need to be defended and supported (Borman & Motowidlo, 1993; Van Scotter & Motowidlo, 1996).

We propose that it is possible to analyze actions focused on the social side of the enterprise with the same concepts as discussed for the regulation of task performance. Thus the steps in the sequence—goal, mapping, plan, monitoring of execution, and feedback processing—are relevant here, as well. There is one major difference for task performance, however: Social focus actions are primarily based on interactions—thus, the other people

are also acting back—in the form of communicative actions or in terms of other actions. Thus, interactions of people stand in the foreground.

The Self as the Focus of Regulation

High performance requires regulating oneself effectively—self-management (including personality management), self-efficacy, and switch from self to task. Whenever attention is turned to a higher level of regulation, the self system is potentially implicated (Carver & Scheier, 1982). This is particularly so after failure (Mikulincer, 1989).

Self-management implies that the self is managed and regulated. This implies that one knows one's weaknesses and works consciously (and with time automatically) against them and that one knows one's strengths and capitalizes on them. Self-management also implies some meta-cognitive questions: Which long-range goals does an entrepreneur pursue? What kind of approaches does he or she typically take? What has gone wrong and why, and what has gone right and why?

One specific approach to the self, the concept of self-efficacy, has been suggested by Bandura (1997). *Self-efficacy* means that a person believes that he or she can do well on a task. Thus, it asks the relational question: How well is this task suited to my self and how well am I suited to the task? Bandura's self-efficacy should have an influence on all of the steps of the sequence (goal, plan, feedback processing, etc.). In terms of hierarchical regulation, there are two important issues. First, we assume that consistent self-efficacy can generalize and can therefore have an influence on heuristics of setting goals, information collection, and so on. Second, self-efficacy should have a higher influence on consciously regulated task performance than on routinized activities. Thus, self-efficacy should be more highly related to performance in novel actions; therefore, in the startup phase of a business self-efficacy should be more important because novel actions are consciously regulated. Self-efficacy issues should also come up more frequently when task performance needs to be regulated on higher levels, for example, because of errors, difficulties, failures, or opportunities.

The self system is regulated on the meta-level. However, attending to the self implies often that one is consciously thinking about whether or not one is doing well. Reflection on the self is therefore an additional load on the working memory. Thus, attention to the self leads to quick enhancement of achievement in an easy task but, at least in the short term, to a reduction of achievement in a difficult task (Mikulincer, Glaubman, Ben-Artzi, & Grossman, 1991).

Some goals, particularly life and self-presentational goals, are more intimately related to the self than to other goals. It is sometimes argued that emo-

tions are the result of self-regulation (e.g., Kluger & DeNisi, 1996). Although we do not disagree that the self is a good candidate to influence emotions, we do not think that the self is necessarily implied when developing emotions from work (cf. Pekrun & Frese, 1992, for a fuller discussion).

APPLICATIONS IN ENTREPRENEURSHIP

Two applications of action theory to entrepreneurship research should be briefly described: personal initiative as an active approach, and planning.

Active Approach: Personal Initiative

Bandura (1986) argued against control theory because it does not understand increases in goal levels after a prior goal has been reached. Action theory does not suffer from the same problems as control theory does. One of the assumptions of action theory is that people (and many other organisms) are inherently active (White, 1959). White (1959) argued that an effectance motive made organisms constantly searching for new mastery experiences. The effectance motive is tied to the biological survival value of being active. In the language of action theory, people have inherent heuristics of how to approach goals (higher, faster, farer reaching, better, etc.) that imply that one wants to achieve higher goals in task areas of high importance (as in any inherent tendency, there are interpersonal differences, as manifested in achievement motives; McClelland, 1987). Action theory assumes that it is an ontological given that humans are active because activity increases the chance for procreation and for keeping the offspring alive. Action theory assumes that many people become more active with time, because they learn that an active approach increases chances to learn, to control the environment, to reach one's goals, and to reach positive consequences. Active approaches are powerful because they can influence events before they appear (proactivity). One can prevent negative events from happening and/or can prepare for opportunities. An active entrepreneur is actively (systematically or unsystematically) searching for opportunities (cf. Baron, chap. 2, this volume). Active approaches make it possible to adjust the task to one's knowledge, skills, and aptitudes. Thus, the environment is made to fit the person better. An active approach can institute changes more easily because actions are less driven by the situation and more by long-range goals. Finally, natural tasks do not always present optimal feedback. Active approaches make it possible to tune and develop feedback signals that are optimal for learning.

Entrepreneurs are typically more active than the general population. We have introduced the concept of personal initiative to describe this active orientation (Frese & Fay, 2001). This concept allows us to understand why

and how people change their environment both inside and outside a firm. *Personal initiative* is defined as self-starting, proactive, and persistent behavior (Frese, Kring, Soose, & Zempel, 1996). Personal initiative can be divided into facets of goal setting, information mapping, planning, monitoring, and feedback processing (Frese & Fay, 2001). Self-starting implies that entrepreneurs develop self-set goals and that they actively explore the environment and do experiments in it (to get good information). In the area of planning, self-starting means to develop an active strategy (i.e., a strategy that changes the environment and actively intervenes rather than that takes things for granted or just reacts to situational cues), and in monitoring and feedback processing, self-starting means to self-develop feedback signals and to actively search for feedback. To be proactive implies that future problems and opportunities are anticipated and converted into goals, cognitive models, plans, and feedback processes now. Finally, to be persistent means to protect one's goals, information search, plans, and feedback processing against frustration and too high complexity and to overcome barriers when they occur.

Small-scale entrepreneurs exhibit a higher degree of initiative (Crant, 1996; Frese, Fay, Leng, Hilburger, & Tag., 1997). Moreover, personal initiative is related to success in small business people (Crant, 1995; Koop, De Reu, & Frese, 2000; Zempel, 1999). Finally, small to medium-sized firms are more successful if their chief executives scanned the environment proactively when if managers did not do that (Daft, Sormunen, & Parks, 1988). In entrepreneurship research, the concept that comes closest to personal initiative is the proactive stance in entrepreneurial orientation. One facet of entrepreneurial orientation is proactiveness, which has been shown to be related to both the decision to pursue an entrepreneurial career and to success (Frese, Brantjes, & Hoorn, 2002; Krauss, Frese, & Friedrich, 2003; Lumpkin & Dess, 1996; Miller & Friesen, 1982; Rauch, Wiklund, Frese, & Lumpkin, 2005).

Planning

In order to be able to show a high degree of proactiveness, it is necessary to plan. A plan describes the sequence of actions to achieve a goal. A plan is proactive if it is long-term oriented. Planning for long-term events (opportunities or threats) implies that I prepare for these events today. This usually includes some kind of plan B (alternative plan in case the developed plan does not work out). In entrepreneurship, planning is more important than for other occupations, because there is nobody else who structures the goals and the ways to achieve those goals for the entrepreneur. He or she, therefore, has to bet on the unpredictable future and develop plans to achieve those bets.

Although there is a high degree of literature on formal planning in entrepreneurship (e.g., Schwenk & Shrader, 1993), planning from an action theory perspective is concerned with everyday planning. Interestingly, everyday action planning has not been in the foreground of research in entrepreneurship (Sarasvathy, 2001). We differentiate four different characteristics of how entrepreneurs (Frese et al., 2000) structure their approaches to a goal: comprehensive planning, critical-point planning, opportunistic, and reactive. These characteristics can be differentiated along the lines of goal orientation, long-term planning, knowledge base, proactiveness, and situational responsiveness.

Comprehensive planning means that owners develop and implement strategies with high goal orientation, high long-term planning, high knowledge, and high proactiveness. The goals and plans are developed with a long-term perspective. The owners who plan frequently develop a good knowledge base. Long-term planning is an active strategy because it proactively looks at future events, predicts future problems and opportunities, and changes the environment to prepare for these future events. Using complete planning has many advantages because it actively structures the situation and makes it possible to work with long-term anticipation and knowledge. However, there are also disadvantages, as planning is time-consuming and costly. Once one has developed a plan, one is likely not to change it and not to respond quickly to the situation (thus, situational responsiveness is low).

Critical-point strategy plans for the most salient issue first and then plans out other issues after this issue has been dealt with (Zempel, 2003). It can be described as an economic way of main-issue planning (Sonnentag, 1996), meaning that the person has one clear goal in mind and concentrates on the main issues to achieve this goal. Thus, it is goal oriented, not very long term, and it does not deal with potential future problems and opportunities as much as comprehensive planning. Critical-point strategy has the advantage of allowing a certain degree of situational responsiveness because the owners have invested less into their plans.

An *opportunistic* strategy actively scans the environment for business opportunities and acts on new opportunities (cf. Hayes-Roth & Hayes-Roth, 1979). Once an opportunity is found, the respective person easily deviates from his or her prior plans and goals. Thus, situational responsiveness and activeness are high but planning and goal setting are low. The major differences from complete planning and critical-point planning are that opportunistic planning leads people to plan little, to have a low future orientation, and to be easily distracted from a plan of action.² People characterized by opportunistic strategy might put aside a plan quickly and might not plan enough to stay on course in a difficult environment because they are attracted by newly perceived opportunities. An opportunistic owner might,

for example, detect a cheap product and would therefore change the business focus to include it.

A *reactive* strategy characteristic implies that the owner is driven by the situation and there is no or little proactive and planned use of information. Thus, this strategy encompasses little planning and little proactiveness. There is little goal orientation, no long-term planning, and the knowledge base is not well developed because feedback cannot be understood, because these owners do not have hypotheses (as part of their plan) about what might go right or wrong. There is, however, a high degree of situational responsiveness. In contrast to opportunistic planning, owners with a reactive strategy are not actively searching for opportunities and other environmental changes; rather, they stumble on these changes or are made aware by their competitors or other people. No systematic search of feedback is done, and therefore the information is often too late or lacking enough detail to be useful. Therefore, a reactive strategy would only be useful in a completely random environment (which, however, does not exist in reality).

Empirically, the reactive strategy is negatively related to success in most environments, whereas planning is positively related to success (Frese & Kraus, 2006; Frese, Brantjes, & Hoorn, 2002). With planning, there is better knowledge of the situation and the plans include back-up plans for potential problems (plan B). Proactively structuring and influencing the situation should also have a positive impact on success. To be proactive means that the owner can change the situation, knows potential future difficulties, and deals with them in anticipation. Complete planning and critical-point planning imply both planning and proactiveness and are therefore more highly related to success than opportunistic planning, which is only proactive (Frese et al., 2002).

An opportunistic strategy is proactive as it searches for opportunities; however, it is also reactive because the opportunities govern the owners' actions. There is little proactiveness in the sense of developing forethought about potential future problems. Because of the little preplanning involved, a person deviates easily from the pursuit of one goal when other opportunities arise. Therefore, business owners might lose sight of their long-term plans and goals, which might mean that they do not put enough effort into the long-term development of their firm. This also means that opportunistic

²A potential misunderstanding of the term *opportunistic strategy* is that it is confused with the search and exploitation of opportunities as a general characteristic of all entrepreneurship (Shane & Venkataraman, 2000). It should be carefully distinguished. In our view, entrepreneurs are well advised to carefully plan and anticipate opportunities to be able to exploit them. An opportunistic strategy is an active approach but because it implies that the entrepreneur gets easily diverted from a goal, opportunities may not be as carefully searched and as well exploited with an opportunistic approach than with some kind of planning. As a matter of fact, we considered alternative concepts to opportunistic strategy like "easy fix/opportunistic" or "easy win" in the sense of "pick the low-hanging fruits."

owners do not actively *develop* opportunities; they may not be persistent enough; rather, they just attempt to exploit the obvious opportunities (Ardichvili, Cardozo, & Ray, 2003). An opportunistic approach is often characterized by the lack of a clear business vision and by lack of focus (Inkpen & Choudhury, 1995). Nigerian business owners who were opportunistic were shown to be less successful in the long run than nonopportunistic owners (Wilfert, 1992), because they switched their type of business too often. Thus, an opportunistic strategy has advantages and disadvantages, depending on the specifics of the situation. Following this line of reasoning, overall, the pros and cons of this strategy may cancel each other out.

A reactive approach means that there is no planning and no proactiveness. There are no clear-cut goals, and this keeps business owners from dealing with potential problems before they occur. A reactive strategy is a passive adaptation and does not attempt to influence the situation. All of this suggests that a reactive strategy is dysfunctional for success. Empirically, it has been shown that this strategy is negatively related to success in various studies, in contrast to the two planning strategies of comprehensive planning and critical point planning (Frese, 2000; Frese et al., 2002; Frese, Friedrich, & Hass, 2004; Frese, van Gelderen & Ombach, 2000). This is also true of a longitudinal study showing that planning leads to success and is positively influenced by success (Van Gelderen et al., 2000).

Another approach was to study the effects of training entrepreneurs to be less reactive and more active/planning. We have empirically validated a training program derived from action theory and from personal initiative theory for small scale business owners. Entrepreneurs who participated in this training were more successful than entrepreneurs who were in a comparison group (Frese et al., 2004; Glaub, Gramberg, Friedrich, & Frese, 2006).

CONCLUDING REMARKS

We suggested that entrepreneurial performance should be considered from three perspectives: sequence, structure, and regulatory focus. Sequence has the following dimensions: goal development, orientation, planning, execution and monitoring, and feedback processing. Structure is related to a hierarchical regulation of action with four levels: skill level, level of flexible action patterns, conscious level, and metacognitive heuristics. Finally, the regulatory focus differentiates the areas of task and contextual performance, and the role of the self. Our goal with this article was to provide an integrative framework that allows one to pinpoint which aspect of performance one is studying in detail.

Obviously, our presentation is only a first sketch of a complete theory of entrepreneurial performance. This kind of theory promises to fill the gap

between performance predictors and action. For example, expectancies have been taken to be important predictors of performance (Vroom, 1964). However, it is interesting to ask how expectancies affect the action—for example, via goals, orientations, and plans.

There is some need to explicate the role of motivation and emotion within the theory. Motivation is directly linked to goals (Locke & Latham, 1990) and to feedback (Kluger & DeNisi, 1996). Thus far, motivation is easily incorporated. However, there may be motivational and emotional processes directly linked to each part of the action sequence (Klinger, 1985; Pekrun & Frese, 1992). Moreover, people may regulate their emotions in order to develop better performance strategies; for example, when an entrepreneur has to present his or her products, he or she may actually attempt to make him- or herself anxious so that he or she prepares better for this important event. The result is that the presenter gets physiologically aroused before the event (Nitsch & Allmer, 1979). These processes have to be explicated.

The relationship between the self and the sequence, structure, form, and content also awaits clarification. Further, entrepreneurial performance at work is often done within teams. Group regulatory processes have to be tackled as well, and may be partly similar to the ones described for the individual (Tschan, 1995). In spite of these problems, we hope that our contribution can be useful as a framework that helps to decipher what aspects of entrepreneurial actions are important.

There are a number of research questions that follow from this theory. First, the overarching importance of action follows from this theory. That means how actions change the environment, how actions interact with the environment, and how they are influenced by environmental conditions are important issues. Second, although there is evidence that active approaches are more successful in entrepreneurship, there may be exceptions, for example, in chaotic environments. In certain situations, adjustment is more important than active influence (e.g., in a situation in which an entrepreneur is highly dependent on others, such as dependent on banks). Third, each aspect of the action sequence may be the focus of research. Goal setting has been studied best, although self-developed goals were not in the foreground. All the other aspects of the action sequence have not been studied, such as the development of the mental model, how realistic and detailed it needs to be (and under which conditions, this is positively or negatively related to entrepreneurial performance), which signals and prototypes are developed by entrepreneurs and within the context of innovation, and so on. Similarly, the action orientation of mental models has not been explicitly developed (and also the personality variable action orientation has not been studied systematically within entrepreneurship research). Finally, it has not been studied in the field, where thinking on different levels of decomposition is important (cf. Dörner, 1996).

Planning has been studied to a certain extent, but there are many details that still need to be worked out. What kind of planning is too much for an entrepreneur? How are planning and active orientation related? Can there be an active approach without planning that is completely opportunistic (driven by opportunities rather than exploiting opportunities), and under which conditions can this approach have positive effects (Frese et al., 2000)?

The issues of information overload in entrepreneurs has received surprisingly little attention (exception Baron, 1998), although the executive function of working memory is of high importance in somebody who has to deal with various task domains as small business owners typically do. An obvious parameter here is cognitive ability, and another is how strongly actions are regulated by automatized or routinized schemata.

Surprisingly, feedback processes have been little studied in entrepreneurship, although feedback is one of the most important facets of learning processes.

Further, it would pay to take the differentiation between levels of regulation seriously in entrepreneurship research. Too often the different levels of regulation have been used as opposites and not as complementary. For example, scholars seem to argue about whether decision making is primarily intuitive or deliberate, rather than acknowledging that these belong to different phases of the learning process and environmental redundancy (the more practice a person has in redundant environments, the more automatic and intuitive are actions). Further, neither of these levels of regulation can be called more effective or efficient than the other, because this depends on the task structure. New tasks need deliberate and conscious regulation. On the other hand, it is efficient to routinize and delegate tasks to lower levels of regulation if they repeat themselves. Whenever, an environment changes, the person with old routines geared toward a different environment has more difficulties relearning. However, if the environment stayed the same, we would call this person an expert because of his or her routines. Obviously, there are many issues here that have not been resolved. One question is: How can training increase the flexibility to go from one level to the other? (We tend to think that a training device we developed—error management training—helps with that, but this has not yet been empirically proven; cf. Frese, 1995.)

In general, action regulation theory is useful because it allows to start with cognitive concepts that are directly related to actions—regulation processes. Cognitive models applied to entrepreneurship have been often in the area of pre-action cognitions, such as expectancy \times value models (e.g., Krueger, 2000) or in areas of understanding statistical information or general decision making. Although we think that these models are useful, we also think that cognitions that directly regulate actions may be more important for entrepreneurship research. Action regulation theory has overcome

the bias of cognitive theories to be contemplative rather than dealing directly with cognitive action regulation. We therefore think that it is a useful theory for entrepreneurship.

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