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# 3. Entrepreneurial Activities in a Regional Context

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## 1. INTRODUCTION

Despite all efforts made by political agents to reduce the gap between regions with a high level of economic activities and those with a considerably lower one, an uneven distribution of regional success and development can be observed. For example, in Germany, there is a decline in economic activities, like innovations, employment or start-ups rates, from the south to the north and in addition a decline from the west to the east. This chapter focuses on one of these aspects, namely the uneven regional distribution of entrepreneurial activities. Such a distribution is observed in many empirical studies (Fritsch and Niese 1999; Bade and Nerlinger 2000; Berger and Nerlinger 1997).

Because of their influence on variables like competitiveness, innovativeness and the rate of unemployment, entrepreneurial activities have implications for the (economic) development of regions. Thus, there is a practical and political interest in understanding entrepreneurial activities in general and the regional factors that influence their distribution in particular. The aim is to be able to copy the success of some regions to others.

Furthermore, there exists a motivation to analyse and to explain entrepreneurial behaviour and divergent regional development theoretically to gain some new insights into the ongoing processes. Most economic studies focus on an econometric analysis. Based on an available data set, variables are identified that are decisive for the start-up rate in a region and the impact new firms have on growth and development (Nerlinger 1998; Almus and Nerlinger 1998; Steil 1997). This line of research provided some interesting results but there are still some aspects lacking and the question remains open whether these factors are sufficient to explain the observed dynamic phenomena. In order to get a deeper understanding of the ongoing processes, it is worth

taking a closer look at regional entrepreneurial behaviour and the variables influencing it. In this context, information flows and the ongoing learning processes are taken into consideration.

The central questions this study aims to answer are which regional factors influence the decision to start a firm, which resulting dynamics can be observed and, based on this, how do regional disparities in entrepreneurial activities emerge? Besides 'general environmental conditions' like financial capital or human capabilities often mentioned in the literature, this study argues that (regionally shared) cognitive representations and information processes moderate agents' decision making and thus have an impact on entrepreneurial activities or on regional activities and development in general. Without arguing against the importance of the environmental factors, the focus of this study concentrates on the interaction between entrepreneurs that can serve as a positive example for other agents and the cognitive representation regional agents possess.

The chapter proceeds as follows. Section 2 gives a short overview of the relationship between shared cognitive representations and decision making. Section 3 shows the impact of proximity and regional networks on the formation of shared cognitive representations. In section 4 the question is answered of how the regional disparities in entrepreneurial activities based on the influence of positive examples come about. Here the basic theoretical insights that result from the previous sections are used. The last section concludes.

## 2. (SHARED) COGNITIVE REPRESENTATIONS AND BEHAVIOURAL PATTERNS

The agent assumed in this chapter is a boundedly rational one, implying that he has not full information and only has limited cognitive computation abilities. The following framework (Figure 3.1) is used to explain how (shared) representations come into existence, change over time and disseminate between a group of people.

Agents' behaviour and decisions strongly depend on the information they receive from their environment. Since an individual agent only possesses limited information-gathering capacities, he does not have (technical) access to all the information necessary and his willingness to gather new information is limited because, for example, the involved costs are too high. Therefore, it can be assumed that the agent does not have all the relevant information for an 'optimal' decision. Furthermore, since attention is scarce, the agent must discriminate and 'decide'[1] which information to pay attention to. An

important factor that influences attention processes of agents is the fact that information must fit into already existing patterns or at least can be easily linked to the known elements. This screening is done by cognitive cues that are themselves aggregated and linked to cognitive frames or representations (Anderson 1980, Chapter 2). Thus, the cognitive representation an agent holds has an impact on his perception of information coming from the environment and the interpretation of the world. In addition, the memorising of information, the decision set to choose from, the evaluation of alternatives and, finally, the behaviour of the agent is influenced by the cognitive representation (Anderson 1980, Chapters 5, 8 and 10). Depending on different factors, like the context, the importance of the decision or the frequency of decision making, mental decision-making rules can consist of various mechanisms. These are, for example, cognitive evaluation of the situation, maximisation strategies, trial-and-error processes, as well as the 'unconscious' usage of heuristics. Thus, according to the cognitive representation, the subjective information and the decision-making rules, the agent chooses one possible alternative that leads to a certain action and behaviour.[2]

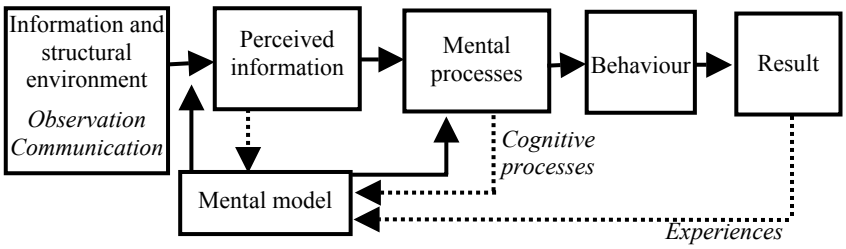


*Figure 3.1 Structure of information processing and individual decision making*

As previously mentioned, the cognitive representation the agent possesses is important for decision making. New information can have a twofold effect on decision making: on the one hand, the agent may choose an alternative from the existing decision set based on the new information, the existing representation and the decision rules without changing the latter two. On the other hand, new information could change the cognitive representation. This might have an impact on several factors. The cognitive attention could be (re-)focused on other kinds of information, the incoming information might be perceived and memorised in a different way, the decision set and the evaluation of alternatives may change and as a result a change in the behaviour of the agent might result.

It is shown in this section how such a change in the representation takes place by individual and collective learning processes. Of central interest is the emergence of new representations and their dissemination in the whole population. On the group level, new information or a new representation can be introduced by an individual agent from within the group or from the outside (broadcasting, new actors and so on). On the individual level, a new representation can be introduced by processes like the copying of representations or elements from one context to another, directed and undirected imaginative thinking or errors that occur while incorporating representations from other agents. Furthermore, a new representation for the individual can result from interaction, observation or communication processes (Bandura 1986, Chapter 2). The latter processes are important for the diffusion of the representations inside a group.

Besides the processes leading to the diffusion of new cognitive representations, the question has to be answered: which factors influence the acceptance and integration of new representations? On the one hand, there is a functional explanation that is related to cost-benefit considerations including achievement level considerations and social sanctions that might result if the behaviour of one agent deviates from the socially preferred one. From this perspective, a new representation is accepted and exchanged for the old one, if the individual profit provided from the new representation is higher than the profit from the old representation. On the other hand, there are more psychological-oriented theories that explain the adoption of a new representation by the cognitive leadership of special agents (including quality, validity, reliability and reputation of this agent) (Witt 1998; Senge 1990), by the comparability of agents and the identification with one another or by consistency theory (including theories about cognitive dissonance, statements that self-evaluation and external evaluation should match each other and nearness to or similarities with the old model) (Heider 1958; Granovetter 1973; Bandura 1974). Note that the acceptance of the model is, according to these approaches, not necessarily linked to an objective improvement in profits or other benefits. It is sufficient for the acceptance that agents think a certain kind of behaviour is appropriate and they would somehow gain from it without the decision being based on actual facts. In addition, the willingness to accept new models is influenced by cultural factors.

Related to this is the question of how cognitive representations agents hold converge. There are several biological, sociological and cognitive processes that influence the diffusion of a cognitive representation. There are some very basic factors like genetic reasons (Witt 1999a, 2000) or aesthetic factors (Schlicht 2000) that are inherited in every human. This is the basis for many learning processes and results in a convergence of representations on a very abstract and general level. More central to the following argument is the fact

that agents are not isolated but are embedded in a social structure. Thus, an important influence relates to the frequency and intensity of interaction, communication and observation between agents. The higher the frequency is, the more likely it is that the agents will develop similar representations because of social learning processes (Witt 1996). The agents might be exposed to similar information because they have access to the same information channels, have common focal points or similar foci of cognitive attention (Sugden 1995; Lorenzen and Foss, Chapter 5, this volume). Furthermore, similar representations can develop because the agents are part of the same reference group or have the same cognitive leader.

These factors can be obstacles to a change of the representation as well because they hinder the emergence of new models. In addition, the adaptation of new representations and their convergence is hampered by a lack of creativity of the single agent or closed social networks.

Based on these influences, diffusion dynamics are derived. Briefly, it can be noted that the information and learning processes are (at least partially) self-augmenting processes because of positive and negative feedback loops, which have frequency dependency characteristics, and are influenced by critical mass effects (Stahl 1998; Witt 1989, 1996). Since the agents in a population are interacting with and observing each other, they get to know the behaviour of other agents, which they might imitate. Such an imitation based on behavioural examples leads to positive feedback loops because the more agents change their behaviour, the more agents can observe this and adopt their own cognitive representation and behaviour.

These endogenous processes result in a situation in which the cognitive representations and resulting behavioural modes present in the population are quite stable with respect to small fluctuations in the number of users. An example of this is the agenda-setting role or shared cognitive representations: most of the population has the same focus of cognitive attention and thus is exposed to similar information (Witt 1996). Although it is likely that there are always some agents whose representations deviate from the 'common' one, their representations and according behaviours cannot diffuse in the whole population. On the contrary, until a critical mass of agents using a new representation is reached, the self-augmenting processes sustain the shared old representation. But once the critical mass is overcome, the self-augmenting processes lead to a quick diffusion of the representation in the remaining population. Factors, which influence the introduction and diffusion of a new representation and thus the overcoming of a critical mass are, for example, size, heterogeneity and openness of the group.

To summarise the argumentation: cognitive representations and information available to the agents are the basis for decision making. Despite all individualism and the liberty to choose action and behaviour, the agent is

embedded in a social context that has an influence on the representations and the ongoing learning processes. This leads to the establishment of shared cognitive representations in a group of agents and, thus to similar perception, evaluation and decisions, especially if the information agents receive are similar as well. The latter is likely since a common representation implies similar cognitive attention.

There is a time lag in changing the representation and adopting the behaviour because of the necessity to be exposed frequently to the respective cause (observation, communication or experience) or because of the delay between action, result and feedback on the representation. The 'correctness' of the cognitive representation is not guaranteed in the short run since the representation is quite persistent because of the described time lags, stable interaction and communication patterns related to closed discussion groups, scarce cognitive attention and limited information gathering. The dynamics lead to quite stable cognitive representations and information exchange patterns because of the feedback loops and the frequency dependency of many of the processes. On the other hand, the same processes result in a rapid dissemination of a new representation once a critical mass is overcome.

## 3. BEHAVIOURAL PATTERNS AND DIFFUSION OF COGNITIVE REPRESENTATIONS IN A REGIONAL CONTEXT

Based on the presented factors, it should be analysed in this section how regional characteristics influence decision making with the result that regions differ. This is linked to the previously mentioned factors of regional information access and the establishment of shared cognitive representations.

One important factor of decision making and behaviour is the direct informational input. Information that is (only) locally available could explain different region-specific behaviour. Apart from general information that might be collected by other means as well, it is especially information like gossip or know-who that is region-specific and special to local information channels. The most important channels are region-specific one-way communication (for example regional newspapers or regional TV), regional information networks (for example informal social networks but also region-specific information infrastructure) and unintended as well as intended information supply based on interaction or chit-chat. Besides the direct impact of information on decision making, (new) information can influence the cognitive representation the involved agents have. Processes like interaction, communication or observation are relevant for changes in the agent's cognitive representation.

These processes are related to the information channels by which information is collected and diffused intentionally or unintentionally.

There are two effects influencing the convergence of cognitive representations and determining the information accessible to different agents: proximity and network effects.[3]

Beginning with the proximity effect, it is argued that it is much easier for local agents to observe specific modes of behaviour. Besides the mere observability, the frequency of interaction, communication and observation between agents who are located near to each other is relatively high.

Here two different issues have to be considered. On the one hand, the proximity effect is caused by unintended interaction meaning that it is just by chance that one agent meets another agent; for example, in the bakery or the store as well as his neighbour on the street. On the other hand, it is based on intended interaction that is more likely to occur with people in the same location. This might be the case in evening courses, sporting events or a dancing school.

Furthermore, there might be common focal points and a common local focus of selective attention because of the same background. Comparability of agents, identification with other agents and the adoption of cognitive representations is easier if the agents grew up in the same environmental context, belong to the same reference group or have the same cognitive leader. All this makes it more likely, as previously argued, that the agents develop similar cognitive representations and use similar regional information. These shared cognitive representations are quite stable according to the considerations described.

Besides the proximity effect, there exists a network effect, which also influences the diffusion of cognitive representations and information access. Two important characteristics of this effect are now mentioned. First, although the argument was put forward that factors like the frequency of interaction or regional reference groups influence the adoption of regional cognitive representations, it is not very likely that the whole region is a homogeneous mass with just one reference group and the same frequency of interaction between all agents. Inside one geographical region there exists a social network structure based on factors like work relations, family ties or friendship. The interaction of two agents depends on the network structure that they are part of and not only on their location. Thus, if we assume that there is a 'normal' influence based on proximity effects, the network effect can change this influence because of the selective choice of partners in intended interactions. It increases the proximity effect if the agents are in the same network in which case the frequency of interaction is higher. Analogously, it decreases the influence if the agents are in different networks because the likelihood of interaction is lower than average. Thus, the

influence of specific information, cognitive leadership, reference groups, common focal points, comparability of agents and the frequency of interaction, communication and observation has to be analysed with regard to their specific characteristics in networks. Second, although networks structure regional interactions, they have a bridging function to link agents from different regions. This has several implications. The most important ones are as follows. New information is introduced to a region that might be relevant for the economic activities of regional agents. Furthermore, agents from other regions are attracted to one region because of different factors like good job openings, universities or financial capital. On the one hand, these agents bring new ideas into the region that might be taken up by regional agents. On the other hand, they are influenced by the local agents and this leads to the development of the same cognitive representation. In addition, it is possible that agents from other regions are attracted because they already share cognitive representations and behavioural patterns with agents from this region.

There are some relevant features for the diffusion within as well as between networks and thus for the dissemination of a cognitive representation in the whole region. This is the size and the composition of networks, for example heterogeneity versus homogeneity of network agents, the openness of networks to other networks inside or outside the region and linked to this the existence of gatekeepers who bridge the different networks. Cowan and Jonard (1999) found by simulating the knowledge transfer in differently structured networks, those so-called 'small world' networks with a high degree of cliquishness and a short average path length are most effective in the diffusion process.

According to the above arguments, regions, based on proximity and regional network effects, influence decision-making processes by the formation of shared cognitive representations and by region-specific information access. This leads to specific regional behaviour that differs from other regions.

In order to understand better the differences in regional founding activities, the findings from the previous sections are applied to regional entrepreneurial activities in the following section.

## 4. IMITATIVE BEHAVIOUR AND REGIONAL ENTREPRENEURIAL ACTIVITIES

The analysis in this section should answer the questions of what impact learning by imitation has and how shared cognitive representations influence

start-up decisions of regional agents. The argument is put forward that disparities in regional founding rates might be, at least partially, explained by these factors.

Entrepreneurial activities can be understood in various ways. According to Schumpeter, an entrepreneur leaves the economic equilibrium and initiates a new development (Schumpeter 1934). This is not only restricted to owners or founders but does also include later stages in the life cycle as well as employees who can have an entrepreneurial role. In this chapter, the central focus is on the actual founding of a firm.

The regional context is chosen because the uneven distribution of entrepreneurial activities leads to the conclusion that some regional factors must exist that influence these activities and thus cause special regional founding behaviour. It has been found in the literature that although the national variables have an influence on the activities, regional peculiarities especially influence entrepreneurial activities; for example Nerlinger (1998) pointed out that the regional unemployment rate is more important than the general one.

The relevance of start-ups for the economic development of a region has been analysed in various studies during recent years. Start-ups and small firms play a special role because they are able to exploit new opportunities and adapt quicker to changing environmental conditions since they are normally more flexible than big firms. Brenner (2001) pointed out the importance of start-ups for the establishment of localised industrial clusters which, in turn, have a positive impact on employment, growth and innovativeness. Several case studies in different European regions (for example Cambridge, Jena or Grenoble) confirm this. They show that spin-offs from existing firms or universities are important for the establishment of regional clusters and innovations in the high-tech industry (Keeble et al. 1999; DeBernardy 1999; Hendry et al. 2000).

Many other econometric studies also concluded that start-ups and small firms have a positive impact on different factors. It was found that a high rate of turbulence, meaning that many firms start up, but also many firms close, is related to growth (Davidsson et al. 1994; Bednarzik 2000; Klomp and Thurik 1999). Furthermore, young firms have the highest increase in employment (Bednarzik 2000; Klomp and Thurik 1999), whereas, the results are mixed if it is analysed whether small firms have the highest increase in employment (for example Kirchhoff and Greene (1998) supported the hypothesis while Klomp and Thurik's (1999) findings rejected it). Although there are some clues that a high number of start-ups decreases the rate of unemployment, the available results were not (yet) significant (for example Audretsch and Thurik 2000). Nevertheless, all the relevant findings together show that regional start-ups have a positive impact on regional development. Besides these positive

effects, it should be noted that negative second-order effects might result from a strong increase in regional start-ups. These are, for example, rising rents, wages or social tensions, as well as strong turbulence in the labour market because the employees of closed-down firms have to find new jobs or new firms recruit employees from other firms.

Since entrepreneurial activities have an important impact on regional success and development, a theoretical as well as a political interest to identify and duplicate the factors, which lead to a high level of entrepreneurial activities, is given.

## 4.1 Basic Considerations and Theories regarding Regional Entrepreneurial Start-ups

Some theoretical approaches to entrepreneurship or entrepreneurial activities are presented briefly (in accordance with Shane 2000). These are, in part, taken up later and this overview may help to integrate the following arguments in the existing line of research.

In neoclassical theories, entrepreneurial activities are hard to include since '(…) no one can discover a misalignment that would generate an entrepreneurial profit because, at any point in time, all opportunities have been recognised and all transactions perfectly coordinated' (Shane 2000, p. 449). Thus ad hoc characteristics of agents (for example preference for uncertainty) 'explain' who becomes an entrepreneur. Most psychological analysis focuses on fundamental personality, motivation or cognitive characteristics that favour entrepreneurship, like self-confidence, profit orientation, individualism, optimism, alertness, need for achievement, willingness to bear risk or internal locus of control and by which entrepreneurs differ from non-entrepreneurs (Wiswede 1995). A socio-psychological perspective takes into consideration how the social environment influences the agents to become entrepreneurs. For Simonton (1975), the role model availability is of central importance because the existence of role models leads to imitation by model learning. The closer social environment like families, social milieus or reference groups is especially important but the general attitude in the society towards entrepreneurship is relevant as well. The so-called 'push theory' argues that negative situations like unemployment or a blocked career lead to entrepreneurial activities (but only if this is combined with strong internal control convictions of the agent) (Brockhaus 1982).

The Austrian Economic Perspective assumes an uneven distribution of information and knowledge among economic agents. This prior knowledge and information influences the discovery and exploitation of opportunities. A situation results in which the likelihood of discovering business opportunities

is unevenly distributed; some agents discover none and other agents discover several opportunities. Cognitive theories about entrepreneurial decision making use an individualistic perspective but also take into consideration the external (cultural and social) environment. Decisions are affected by the perception and interpretation of the environment. Entrepreneurial '(…) intention is a function of the interaction of a person's "thinking" with the individual's past history, current personality, and social and economic development (…)' (Busenitz and Lau 1996, p. 26). It is analysed how cognitive processes, which are influenced by the environment in combination with incoming information, lead to the decision to start up a firm.

## 4.2 Stages in the Entrepreneurial Process

In this section, several of the previously mentioned elements are taken up and are integrated in one model. Culturally determined or genetically fixed characteristics are excluded, while the development of important individual characteristics is assumed to be the result of learning and adoption processes in a social environment. Furthermore, it is assumed that the differentiation of agents in two categories (entrepreneur or non-entrepreneur) is not sufficient. It is suggested that it is much more appropriate to view an entrepreneur as the result of a developmental process along different stages that are all important to explain entrepreneurial activities and their change over time (Figure 3.2). During the development through the stages, the cognitive representation of the agents changes. The decision to start up a firm itself is, as previously stated, strongly influenced by information exchange and the cognitive representations agents hold. The whole process implies that the individual agent has more freedom to choose his action than in culturally determined theories but, nevertheless, he acts in a social environment that restricts his choices in comparison to totally isolated agents.

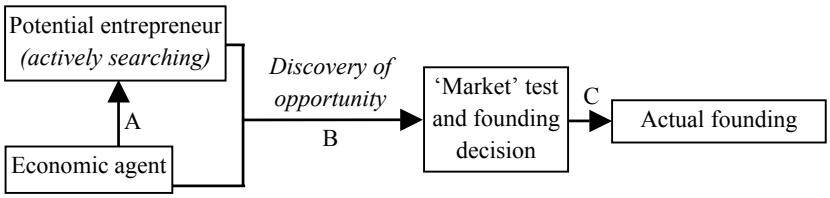


*Figure 3.2 Stage model of entrepreneurs*

The regional population of 'economic agents' and potential entrepreneurs is heterogeneous. The agents differ, for example, with regard to their knowledge and capabilities, personality characteristics, information access or

cognitive representations. These differences are shaped by the social environment the agents are part of. Economic agents and potential entrepreneurs differ in one important respect: potential entrepreneurs are actively searching for business opportunities to found a firm while economic agents do not. Thus, an economic agent does not have the concrete intention to start up a firm but is just pursuing his job or other activities. Nevertheless, he is able to discover such opportunities. In comparison a potential founder has realised that the idea of starting up a firm or entrepreneurial activities, in general, is a good alternative and starts to actively search for opportunities investing time and financial resources.

Note that this does not imply that all potential entrepreneurs necessarily have a higher likelihood of discovering opportunities and starting up a firm or that they have a higher probability of continued success with their firm once they have started up. But, on average, the likelihood of discovering an opportunity is higher in this group since they focus cognitive attention and material resources on the search activity. Not all individuals independent of whether they are actively searching or not are equally likely to recognise a given entrepreneurial opportunity (Shane 2000). In any case, the discovery of opportunities strongly depends on the agent's prior knowledge of, for example, technologies, markets or customer wishes, their information channels and information-processing abilities, as well as on the cognitive representation, which might focus the search on specific areas.

Once an opportunity is discovered, a business conception has to be developed and evaluated with respect to its potential market success ('market test'). Furthermore, the actual founding decision has to be made that depends on the perception and evaluation of opportunities, alternatives and own capabilities ('realisation test'), as well as on the willingness to start a business. This, in turn, is influenced by personal factors and characteristics, the access to relevant information, as well as by the cognitive representation the agent possesses. According to Witt (1999b), a self-sorting takes place in which the agent decides whether to become an entrepreneur and take the risk or not. This sorting is a result of multilateral subjective opportunity costs that include pecuniary considerations as well as non-pecuniary ones.

The stage at which the actual founding takes place includes the planning and the direct founding process including questions like where to start, how to get the financing and which employees to hire and so on. It is by no means certain that the involved agents already know exactly how their business conception should look like. If the evaluation of the general conception has a positive result, it is possible that the firm is founded first and after that an active search process takes place to decide exactly what to do and how to do it. This last stage also includes all the operative and strategic decisions that are based on the business conception and which are important for the survival of

the firm. At this stage, the entrepreneur tries to exploit the perceived opportunities and at the same time actively searches for new ones, which are again tested for realisation. The quality of the decisions made here influences the success of the firm.

There are several important processes going on inside each stage and the step from one stage to the other is quite important in explaining the development of the entrepreneur until the firm has really started up and is operating. In reality, it is hard to separate these different stages from one another, but it serves as an analytical tool of distinguishing between different effects presented in the next section. Although mainly one direction is presented here, it is also possible that an agent just stays at one stage without developing further or switches back to an earlier stage, for example an agent who tried to run a firm, got bankrupt and does not want to start a firm ever again. Thus, the presented model and the development of agents from one stage to another is by no means a linear and deterministic process.

### 4.3 Impact of Positive Entrepreneurial Examples on Development through the Stages

Resulting from the stage model, the analysis now focuses on an important factor that influences the switches between the stages, namely the role of positive regional entrepreneurial examples. The focus on this element should not deny the role of other important factors like environmental conditions. Nevertheless, it is claimed here that some additional insights can be gained through taking into consideration imitative behaviour.

As previously mentioned, the cognitive representations strongly influence the behaviour of the agents in the different stages. It is assumed that these representations change while developing from one stage to the other. Or to put it another way, the change of the cognitive representation is one important factor (besides others) leading to the development from one stage to another.

Although there are different elements influencing the cognitive representation, the argument put forward here is that this development and the related likelihood of discovering entrepreneurial opportunities and increasing the willingness to start a new firm is strongly influenced by positive examples, so-called role models, present in regions. Thus, the cognitive representation changes because of imitative learning processes (Bandura 1986, Chapter 2). The agents observe other agents, their behaviour and the corresponding results and may imitate them. Such a positive role model can be found in the direct social environment (mother, father, friends and so on) or can be heard of via external information supply (van Praag 1996; Kriegesmann 1999). The described role model or imitative learning process can influence the switches between the stages at three important transitions.

The first one relates to the switch from an economic agent to a potential entrepreneur (arrow A in Figure 3.2). Agents who observe the successful entrepreneurial activities of other agents take these as positive examples and may reach the conclusion that they should start a business on their own.[4] They do not have any concrete business ideas or perceived any opportunities yet. Since, in principle, the agents have the willingness to found, the result is a (re-)allocation of cognitive attention to the idea of founding in general and the active searching or the production of business opportunities.

The second transition is linked to the search and discovery of business opportunities (arrow B in Figure 3.2). It can originate from the potential entrepreneur as well as from the economic agent, although the latter is not actively searching. The perception and generation of opportunities is based on the (entrepreneurial) environment and the cognitive representation the agents possess. Positive examples can have a twofold effect. First, positive examples make it easier to discover entrepreneurial opportunities because other (comparable and successful) business opportunities are known and serve as examples or references. Technological or market information are tested if they match known positive examples.

Second, the examples lead to a (re-)allocation of cognitive attention to certain opportunities or business conceptions. The direction of active search, as well as the perception of opportunities is biased for example to the regionally or technologically 'common ones'. In addition, it is possible that in a regional context with similar cognitive representations and information access, many opportunities in a specific field can be endogenously created because of the focused use of resources. The disadvantage is that other opportunities might be neglected; there are diminishing returns to searching activities in just one direction and the competition between the agents increases. In general, the likelihood of discovering specific opportunities is higher than discovering others (which is not only caused by prior knowledge or information access).

Finally, there is an impact on the transition from the realisation test to the actual founding (arrow C in Figure 3.2). The cognitive representation and the comparison with other existing entrepreneurs influence the evaluation of business conceptions and the founding option. Although market tests should be based on objective facts in order to decide whether a business conception is worthy of putting in action, the collection of data and especially its evaluation is subjective in the end. This is particularly true in markets that are just emerging and in which a prediction of the future development is not an easy task. Furthermore, the founding decision is based on an evaluation of the option to found a firm and other alternative options. Positive examples can lead to a bias in the evaluation and to an increase in the likelihood of starting up a firm. Since, for example, the related threats and risks are moderated by

the cognitive representation, the agent might underestimate them. In addition, the general attitude towards risk is not a fixed factor but can change over time by the influence of imitative learning. The same is true for the desire to be independent, an important element related to the actual founding decision (Kriegesmann 1999), which is also a variable developing over time and being influenced by cognitive representations.

As presented in section 2, the acceptance of new cognitive representations and the choice of models is dependent on several variables like the comparability of agents or the success of shown behaviour. Furthermore, the agents have to know that such a model exists and which characteristics it has. As shown in sections 2 and 3, proximity and network effects or regional information access, in general, are important for this process. Agents from other regions can serve as models as well. This is of particular importance if no regional models are available and the whole described process is not able to start. Nevertheless, in short, it can be said that regional models are more relevant for the learning processes than others.

Besides the original distribution of capabilities, financial capital and other (regional) environmental conditions, the positive examples and role models have an influence on the development of an agent and subsequently on the likelihood of starting up a firm. In the next section, some of the dynamics of regional entrepreneurial activities and regional divergence are explained.

### 4.4 Feedback Loops and Regional Divergence

This section deals with the feedback link between the number of founders and the cognitive representation of agents. As previously argued, potential, as well as actual regional entrepreneurs, can serve as positive examples. The former influences the process marked by arrow A and the latter influences all three processes. In order to serve as a positive example, a firm does not really have to be profitable and successful. It is sufficient for the acceptance as an example if it is assumed to be successful by other agents or if the role of an entrepreneur is linked with social prestige. An example leads to a change of the cognitive representation agents posses which in turn, increases the likelihood that these agents also found a firm. The higher the number of actual and potential entrepreneurs, the higher the likelihood that other agents will take these as positive examples and change their model. Thus, the number of entrepreneurs serving as examples influences the cognitive representation and vice versa. A self-augmenting process results that would increase the number of entrepreneurs higher and higher.

Such an increase in the number of start-ups does not have to be based on objective facts and market tests, since the evaluation is influenced by the cognitive representation of the agents, which lead to subjective results. A

situation can emerge in which there are more new firms entering the (regional) market than can survive in the medium or long run. Such an overshooting effect and the increase in the number of firms in general is restricted by the environmental conditions (for example the wages and rents will become too high, the agents do not have the capabilities to found or there is no financial capital available), the limited number of good opportunities, the barriers to entry (including the necessity of a market test) and the self-sorting of the agents in the market test phase (including the available alternatives). Furthermore, the diffusion of the according cognitive representation is restricted by the factors described in sections 2 and 3.

Without going into detail here and analysing the different dynamics of the feedback loops including the time lags, critical mass considerations, frequency dependency effects and the negative feedback, it can be argued that over time the self-augmenting processes lead to a convergence of cognitive representations the agents hold. A specific kind of shared cognitive representation evolves that favours entrepreneurial activities in the region. If a high level of entrepreneurial activities can be sustained for a longer period of time, the (sum) of positive examples can result in a specific entrepreneurial attitude. Thus, shared cognitive representations can lead to the emergence of an institution. Furthermore, a functional focus regarding the direction of search for opportunities might result with the previously mentioned positive and negative implications.

As was described in section 2, such a shared cognitive representation is quite stable. Thus, it needs a higher number of new examples or a very prominent one to change. This has implications since, on the one hand, the diffusion of an entrepreneurial orientation in the population is hindered by these factors, but on the other hand, if such an orientation once spread in a considerable share of the population, it is likely to be sustained on a higher level. Furthermore, if there are only two possible cognitive representations, the diffusion paths from one to the other and back are different. This is based on the effect that positive examples and negative examples are perceived differently (Wiswede 1995). Positive examples are easier attributed to oneself than are negative ones.

Regions differ in several of the described processes. Small historical singularities in the regions can lead to a situation in which the regions develop differently, for example depending on the overcoming of the critical mass. Nevertheless, there are factors that systematically influence such developments. These are, for example, the likelihood of diffusion of new representations or positive examples, their acceptance and the alternatives to self-employment available in the region.

## 5. CONCLUSIONS AND OUTLOOK

A differentiation of agents in entrepreneurs versus non-entrepreneurs is not enough to explain entrepreneurial activities and changes in these activities sufficiently. What can be observed is a (forward and backward) development of the agent through different stages that are all required in finally becoming a (successful) entrepreneur. This development is influenced by different factors. A focus only on the general environmental conditions that is common in most of the econometric analyses is not sufficient to explain regional disparities and changes in founding activities. The consideration of information exchange and cognitive representations influenced by proximity and regional networks adds some important insights. In this chapter, a model was presented in order to show how regional entrepreneurs can serve as positive examples for other agents and thus change their behaviour by learning processes. This was done in the framework of a stage model in which positive examples can affect the development through the stages in different ways.

To sum up the argument: only by taking into account the direct impact of general environmental conditions, the influence of (shared) cognitive representations and information access, the actual decision to start up a new firm can be analysed appropriately. Such a view gives an answer to the question of why regions with similar general environmental conditions could have different start-up rates. Furthermore, the short- and medium-term upturns and downturns in start-up rates in certain regions can be explained by the resulting feedback loops and the interrelatedness of the agents. In the long run, these feedback processes lead to a specific regional attitude towards entrepreneurship.

This has implications for political agents because the different factors need different political means if they are to be supported. At the moment, politicians and researchers mainly pay attention to the general environmental conditions without noticing that these are, in most cases, necessary but not sufficient to improve regional economic development. In addition to these measures, policy makers should also focus on the development of entrepreneurs through the presented stages. Positive examples could be one way of improving this. This could be done by supporting their emergence or by increasing the visibility of already existing ones.

In order to confirm the theoretical argument, empirical studies are needed. First, qualitative interviews support the hypothesis that successful entrepreneurs in the region have a strong influence on the behaviour of other economic agents because they serve as positive examples. Furthermore, the development through the different stages presented above seems to describe well the behaviour of entrepreneurs. The next step is to find additional

evidence for the hypotheses by collecting quantitative data with the help of questionnaires distributed to entrepreneurs in the region of Jena.

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## NOTES

1. This process takes place mainly unconsciously but can also be conscious.
2. This is probably not entirely true because an intention to do something does not necessarily match the real action.
3. These two effects are strongly related to face-to-face communication. Although modern telecommunication technologies can facilitate communicative processes, the effect of direct interaction is different and in many situations necessary in order to communicate successfully. Nevertheless, these technologies can help to maintain established social networks over longer distances. But even in that case, occasional direct interactions are helpful to maintain network relations over a longer period of time.
4. This transition could be explained by the 'push theory' as well. Agents in a critical situation, concerned about their current living conditions, could decide that to become an entrepreneur helps them. Here, the borderline between willingness and necessity to 'found' is rather blunt. Such a situation even influences the market and realisation test and might lead to a biased evaluation of alternatives.

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