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## Getting off the track to found : the influence of path dependence on the entrepreneurial process

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## Getting off the Track to Found – The Influence of Path Dependence on the Entrepreneurial Process

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The concept of path dependence describes mechanisms which can lead organizations to a lock-in on a certain path of development. Sydow et al. (2009) describe four basic self-reinforcing mechanisms (learning effects, adaptive expectations, coordination effects and complementary effects) and argue how they can lead to organizational lock-in along three distinct phases. This study investigates the influence of these mechanisms within the entrepreneurial venture creation process (Berger 2015c) and concludes in an argumentation that this process is by no means a determined path. Instead, the forces of path dependence actually lead entities out of the entrepreneurial gestation process in each single step. Therefore, becoming an entrepreneur requires repeated breaches of the determined path, which explains another dimension why starting a venture can be so challenging.

Keywords: path dependence; path breaking; entrepreneurial funnel; nascent entrepreneurs; entrepreneurial process.

## Zbaczając z drogi ku założeniu przedsiębiorstwa – wpływ zależności od szlaku na proces przedsiębiorczy

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Pojęcie zależności od szlaku opisuje mechanizmy, które powodują zamknięcie się organizacji w obrębie określonej ścieżki rozwoju. Sydow i in. (2009) przedstawiają cztery podstawowe samonapędzające się mechanizmy (efekty uczenia się, oczekiwania adaptacyjne, efekty koordynacji i efekty uzupełniające), ukazując, w jaki sposób mogą one prowadzić do uzależnienia organizacji od dotychczasowych praktyk na trzech odrębnych etapach. W opracowaniu przeanalizowano wpływ rzeczonych mechanizmów w procesie tworzenia przedsięwzięć (Berger 2015c), a rozważania podsumowano argumentami na poparcie tego, że proces ów nie jest w żadnym razie z góry ustaloną drogą. Wręcz przeciwnie – siły stanowiące o zależności od szlaku faktycznie eliminują podmioty z procesu rozwoju przedsiębiorczego na każdym jego etapie. Aby zostać przedsiębiorcą, konieczne jest zatem schodzenie co raz z ustalonego szlaku, co ukazuje kolejny aspekt trudności w zakładaniu przedsiębiorstw.

**Słowa kluczowe:** zależność od szlaku, zejście z ustalonego szlaku, lejek przedsiębiorczości, proces przedsiębiorczy.

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## 1. Introduction

At least since Schumpeter's (1934) seminal work, entrepreneurship has been widely recognized as a major driver for economic development through innovation. Especially developed countries heavily rely on entrepreneurship and innovation to secure their competitive position (Brixy et al. 2011; European Commission 2012). For an individual founder, entrepreneurship is a longer process, from developing the general willingness to found a company, through generating a specific idea, to finally founding the venture and making it successful (Berger 2014; Sánchez López 2012; Kelley et al. 2011; Brixy et al. 2011; Bhave 1994).

To understand how entrepreneurial venture creation works, we need to understand the mechanisms to proceed from one foundation step to another. Potential entrepreneurs who do not proceed to the next step eventually reduce the overall number of successfully founded companies (Berger 2015c). Therefore, the process of entrepreneurial activity has to be understood to identify leaks in the whole pipeline and to understand which forces are in place keeping potential entrepreneurs in the process or driving them out. The process step before actually founding a company plays a crucial role here, as it is the last filter before the amounts of investments, be it money or time, get really significant. Especially for potential entrepreneurs with promising profiles (Chandler & Jansen 1992; Brüderl et al. 1992; Cooper et al. 1988; Cooper et al. 1994; Jo & Lee 1996; Hagen et al. 2011; Stuart & Abetti 1990; Gompers et al. 2006; Berger 2014), it would be a huge waste of economic potential not to take this hurdle. To achieve a successful new venture, the entrepreneurs have to move through the entire path of the entrepreneurial process.

Path dependence is a concept which can explain certain mechanisms which make organizations stay on a certain track of development (David 1985; David 2001; Arthur 1989; Arthur 1990; Stack & Gartland 2003; Sydow et al. 2009). This study will apply the insights of path dependence research to the context of the entrepreneurial venture creation process and investigate if there are reinforcing mechanisms which lead to the subsequent process step or, on the contrary, to a drop-out. The study assumes that these mechanisms do not determine a path through the gestation process towards a successful company, but instead force a potential entrepreneur to break a running process to create a prosperous new venture. While generally path dependence research sheds new light on the foundation process and illuminates commitments and frames, this study stresses the need for path breaking, particularly in earlier phases of the development of young firms. Understanding these mechanisms lays the ground for interventions from policy makers, academic educators, etc. to shape the environmental conditions in a way that is more supportive for promising founders and helps them to stay within the entrepreneurial process.

The paper intends to develop a different view of start-up processes by employing path dependence research in a novel way. Due to the need to combine research from different areas as conceptual foundations and to develop a novel perspective, the paper in its very nature is conceptual to avoid an overload. However, follow-up empirical research to confront the considerations with reality is intended.

## 2. The venture creation process

As for the foundation process of a new venture (Bhave 1994), Kelley et al. (2010) developed a process illustration to be used in the annual Global Entrepreneurship Monitor (Kelley et al. 2010; Brixy et al. 2011). In this model, there are four states in the process. The first one is called “*Potential Entrepreneur*” and describes entrepreneurs as individuals who consider the idea of founding a business. This stage does not clearly define how concrete these plans of a person are. It could include people who could just generally imagine becoming self-employed as well as potential entrepreneurs with a concrete idea just before starting. In a later illustration of the process, Kelley et al. (2011) distinguished between potential entrepreneurs and those with intentions to found. The items in the second stage are called “*Nascent Entrepreneurs*” and are defined as individuals who seriously started the conception of a company. Once they implement their plan and actually found a business, they become an “*Owner-Manager of a New Business*” in stage three. Kelley et al. (2011) define this stage as lasting 3.5 years. During this time, the founders are young entrepreneurs, according to their definition. Stages two and three are aggregated and labeled “*Total Early-Stage Entrepreneurial Activity*” in Kelley et al.’s (2011) model. If these young entrepreneurs have not discontinued their businesses after 3.5 years, they proceed to step four and are then labeled “*Owner-Manager of an Established Business*”. Apart from the possibility of

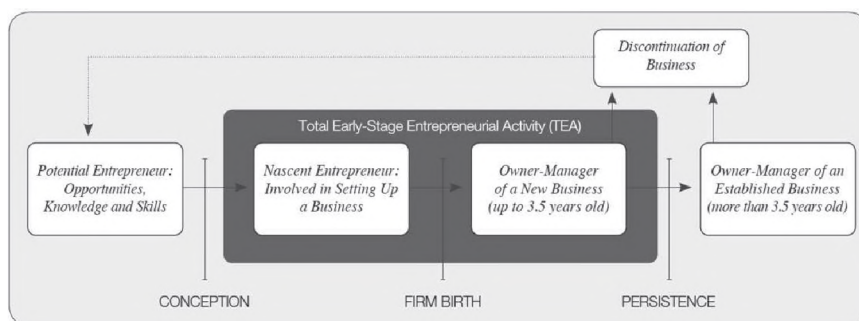


Figure 1. Illustration of the entrepreneurship process by Kelley et al. (2010).

moving on to the next step, the model allows a step back to a previous stage at two points. Both young entrepreneurs and established entrepreneurs can discontinue their respective businesses and consequently move back to become potential entrepreneurs again (Kelley et al. 2010; Brixy et al. 2011).

López (2012) developed a similar framework to better understand the venture creation process. Similar to Kelley et al.'s (2010) model, it consists of four stages. However, they do not describe the same situations. To address the problem of categorizing individuals who cannot imagine founding a company at all, a further stage at the beginning of the process is suggested. This upstream stage describes the attitude towards entrepreneurship and can be interpreted as the general willingness to found a company. Once this general willingness developed into a concrete intention to start, these individuals have reached the first actual stage in López' (2012) process model. He labels this first step as "*Potential Entrepreneurs*" and defines it as individuals with an intention to start a business. Once they developed a concept of their potential business, they move on to the second stage. The third stage describes the gestation phase of a new company when the individuals start to set up the organization of their venture. López (2012) labels stages two and three as "*Nascent Entrepreneurs*". Once the set-up is completed, the individuals become real "*Entrepreneurs*" and participate in the market exchange.

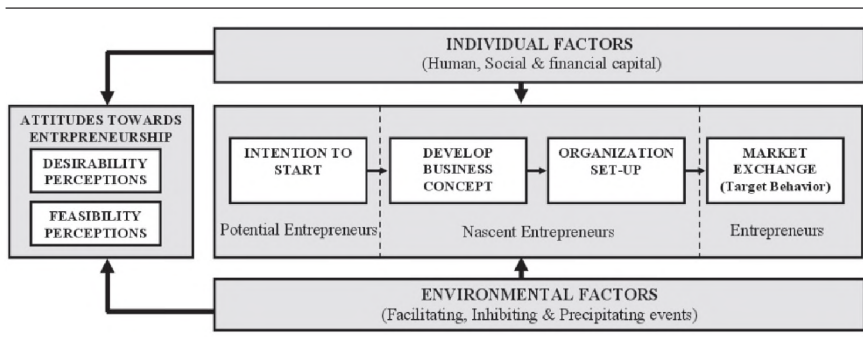


Figure 2. Illustration of an expansion of the entrepreneurship process by López (2012).

There are further descriptions of the entrepreneurial process that focus on particular phases in the venture creation process and break them down into more granular steps. A popular example of such a detailed process illustration was developed by Bhawe (1994). It is focused on the phase of opportunity recognition and details the steps between an initial business concept and the participation in the market. The aim is to better understand the implementation of a value creation process. It does not include anterior

phases like the general willingness to found a company or the creation and evaluation of ideas. Also the perspective of the process model is different. The items passing through the process are not the entrepreneurs as individuals but rather ideas or concepts.

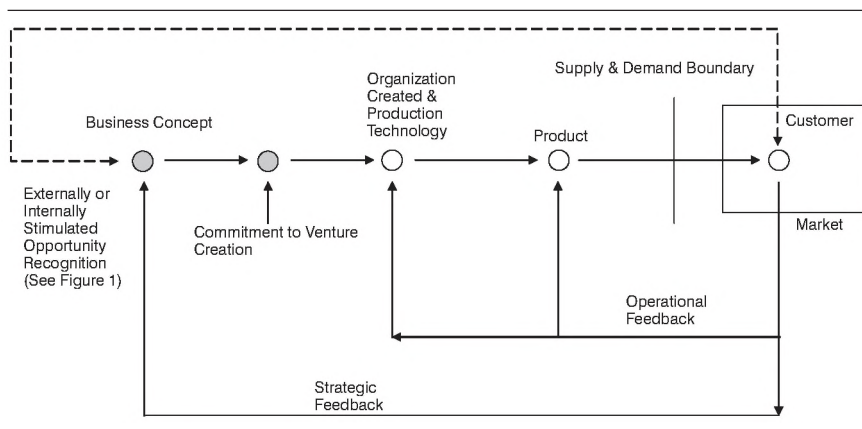


Figure 3. Illustration of the entrepreneurship process by Bhavé (1994).

The framework of the 'Entrepreneurial Funnel' by Berger (2014) provides a structure of both simplicity and high explanatory power, while being compatible with both existing conceptual models of the entrepreneurial process (Kelley et al. 2011; Sánchez López 2012; Bhavé 1994) and present empirical research findings (Fritsch et al. 2006; Fritsch & Weyh 2006; Kelley et al. 2011; Brixy et al. 2011; Ullrich 2013; Hagen et al. 2011; Fiet 2001; GfK et al. 2012) in this area (Berger 2014). Therefore, this paper will build on the entrepreneurial process of Berger's entrepreneurial funnel.

The entrepreneurial funnel differentiates between six steps of the process (Berger 2014). The first one represents the people who cannot (yet) imagine founding a company (Berger 2014; Sánchez López 2012). The process models this step as the very first one, which every entrepreneur as a member of the entire population relevant to this study has to pass through. This is due to the assumption that every human being starts with not being ready to found a company. Participants in this process step are, by definition, not yet potential entrepreneurs, as they obviate the possibility to found a business. The second step represents the potential entrepreneurs – people who could generally imagine founding a company (Berger 2014; Sánchez López 2012; Kelley et al. 2011). This includes a wide span of people who could imagine founding a company, from people who just not definitely exclude the possibility to people who concretely plan to become self-employed. The

individuals in this process step can then proceed to the next step once they have their first actual business idea (Berger 2014; Sánchez López 2012; Kelley et al. 2011). Having an idea what company to found shows progress in the process as planning gets more concrete and hence commitment increases. Once they evaluated an idea as positive in the meaning of being worth trying to implement it, they progress to the fourth step in the process. Having evaluated ideas and considering one or more of them worth trying shows a further escalation of commitment towards starting a business. Once they eventually implement their idea and found an actual business, they become real entrepreneurs and are categorized in the next process step (Berger 2014; Sánchez López 2012; Kelley et al. 2011). Fear can be an important factor that hinders reaching this step (Berger 2014). From then on, the entrepreneurs struggle to reach the next step of the process by making their endeavor profitable. Since it is not possible to give a collectively covering definition of success to the manifold ventures, ‘profitable’ should be interpreted in the sense of the aim of the venture. For non-profit enterprises or social entrepreneurship endeavors, for example, success could be measured by non-monetary profit definitions like illiteracy or infant mortality rates, reflecting the project’s targets (Berger 2014). For a discussion on the definitions of entrepreneurial failure see also research by Watson and Everett (1993).

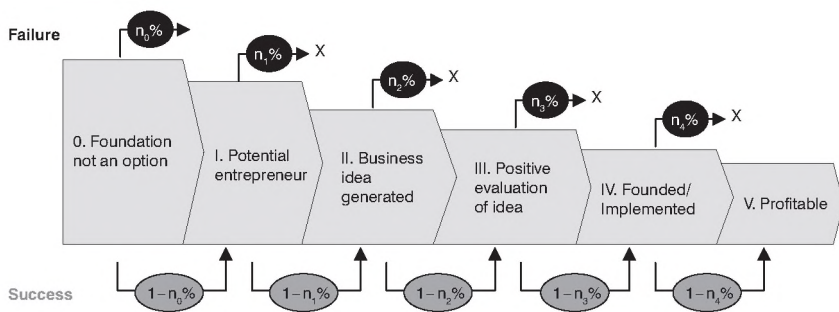


Figure 4. The Entrepreneurial Funnel (Source: Berger 2014).

The aim of the entrepreneur should be to move all the way through the funnel to the foundation of a profitable company. However, there are bifurcations of success and failure in each step, so the items passing through the process will become fewer and fewer. To reflect this, the model of a funnel is used additionally to the process diagram with entrepreneurs as items passing through the funnel. For each funnel step, there is an empirical probability to reach the next funnel step (‘success’



according to the definition of this framework) or to drop out of the funnel ('failure' according to the definition of this framework) with corresponding underlying causes (Berger 2014). Existing research suggests that the failure rate from funnel step IV: *Founded/Implemented* to step V: *Profitable* ( $n_4$ ) is about 50% within the first 5 years (Fritsch et al. 2006; Fritsch & Weyh 2006).

### 3. Path dependence

A powerful concept that can help to better understand the process of venture creation and causal chains that lead to success or failure is the concept of path dependence (David 1985; David 2001; Arthur 1989; Arthur 1990; Stack & Gartland 2003; Sydow et al. 2009). According to Sydow et al. (2009), the concept of path dependence provides a framework which explains the process whereby organizations can get into a situation where their operating range tightens and eventually determines their destiny. Originally, an organization starts with a wide scope of possible options to choose from (Phase I). The process of becoming path dependent, i.e. locked in, starts with certain events as a root cause. Under certain circumstances, these events can trigger self-reinforcing dynamics due to a number of economic and social patterns. As these dynamics get stronger and stronger, a critical juncture is reached where the operating range of an organization narrows (Phase II). When this juncture is passed, the organization inevitably ends up in a lock-in situation with a "corridor of limited scope of action that is strategically inefficient" (Sydow et al. 2009). In this state (Phase III), decisions and commitments taken in the past cannot be undone anymore and trigger follow-up decisions and eventually a lock-in situation (Freiling et al. 2010; Sydow et al. 2009). The organization then finds itself in a state of inertia and suffers from the effect that its 'history matters' (Sydow et al. 2009; Freiling et al. 2010; Teece et al. 1994). Usually the path the organization is doomed to follow at this point in time is not the most favorable one.

To distinguish path dependence from other phenomena, Sydow et al. (2009) characterize the process by four differentiation properties. The first one is *non-predictability*. The historic events functioning as root causes for developing path dependence do not allow estimating the future outcomes. Even more, it usually cannot be foreseen which types of events can lead to a lock-in situation at all. The second property of the process is *non-ergodicity*. This means that the destiny of the organization was not determined before, so it could develop in multiple ways and hence achieve different outcomes. However, the historic events limit the flexibility and determine the path towards one specific outcome out of all previous alternatives. This leads to the third property of the path dependence process, the resulting *inflexibility*. The process is defined by the eventual situation where the actors are locked in and restricted in their decision-making. At this point in time,



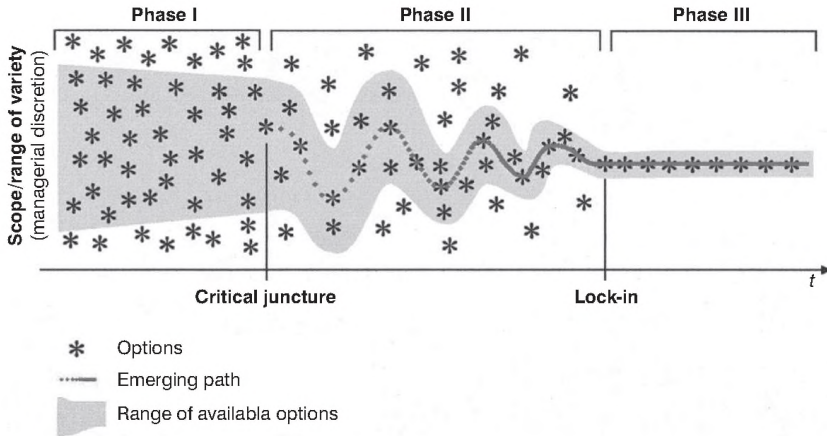


Figure 5. The constitution of an organizational path (Source: Sydow et al. 2009, p. 692).

it is not possible to switch to other options outside the predetermined path. Since path dependence describes a concept of becoming trapped in a suboptimal situation, the process is also defined by *inefficiency*. Usually the path does not lead to a superior position in the market (Sydow et al. 2009). Apart from the fact that not the best alternative of the previously possible outcomes occurred, it is a disadvantage by itself to be limited in decision-making and the choice of options. In today’s dynamic environment, the flexibility to react to changes in the market can condition success or failure.

To gain a better understanding which historic events can lead to path dependence, it is important to investigate how the self-reinforcing mechanisms work. These mechanisms in Phase II of the path dependence process “mean more than the mere existence of timeworn routines, cognitive rigidities, or structural inertia” (Sydow et al. 2009) and will be detailed further in the next section.

### 3.1. Self-reinforcing effects triggering path dependence

Sydow et al. (2009) identify four major self-reinforcing effects that can potentially trigger states of path dependence in organizations: learning effects, adaptive expectations, coordination effects and complementary effects.

### 3.2. Learning effects

Learning effects describe the phenomenon of efficiency gains by repetition. With each iteration of an operation, learning effects occur which allow performing the subsequent operation with increased efficiency (Sydow

et al. 2009). This is a universal concept that applies to most actions requiring a common skill or experience set, not only to exactly repeated actions like operations on a conveyor belt. They can also occur with unique events as long as they share a common underlying pattern, for example certain decision-making rules or approaches to deal with an unknown situation. The concept of decision-making grounded in heuristics is also based on increased efficiency by repeating patterns of previous decision-making. Even complex decisions are often taken on the basis of mental models and dominant logics to increase efficiency and reduce complexity (Prahalad & Bettis 1986). Learning effects can create self-reinforcing situations (Sydow et al. 2009). If certain actions were taken for some time in the past, accumulated skills due to learning effects cause efficiency gains and enable performing the operation with either lower resource inputs or higher or better outputs. This makes the choice to perform the operation in the same way again in the future more attractive. This phenomenon prevents considering other options that could prove to be superior in the long run (Sydow et al. 2009).

Figure 6 illustrates this situation. In this example, an organization initially chose a particular option for action which was at that point in time neither superior nor inferior to all other available options. Due to various reasons like incomplete information, non-transparency or random effects, the chosen option is usually not the absolute superior one right away. At the starting point, this option might have been the dominant one, but over time the environmental conditions changed and new options arose. Through a number of repetitions in performing actions according to this option, the organization learned new skills and increased the efficiency of this operation. Hence, the output to input ratio increased. At a certain time, the organization reaches point X in the graph and considers switching to other options. Alternative A is generally dominant over the currently selected option. However, since the currently selected option for action was already performed numerous times, and subsequently learning effects and hence efficiency gains were realized, switching to option A decreases efficiency very rapidly. This is because the organization has to start at another point in the curve – right at the beginning, with no learning yet. The instant efficiency loss due to switching to option A is marked with  $EL_A$ . This illustrates that it would take an additional investment in learning when switching to another option. The further the progress with the current choice of action is, the higher the investment and hence the barrier to switching options gets. This is similar to an option that is initially inferior but superior in the long run. In this example, alternative option B has a lower efficiency at the first iteration. However, it has a steeper learning curve and therefore soon after a certain number of repetitions gets more efficient than the currently selection option. However, option B has the barrier of required investments in learning compared

to the currently selected option right from the start. Again, the further the progress on the current option of action is, the higher the switching costs ( $EL_B$ ) will be. This example illustrates that there is no single critical juncture but instead a single critical juncture for each of the potential alternatives. In the example, the critical juncture for option B is reached right away ( $CJ_B$ ), the one for option A after a number of repetitions of the currently selected option ( $CJ_A$ ). As the learning progresses, more and more critical junctures of potential options are passed and subsequently the number of available choices with acceptable switching costs narrows down.

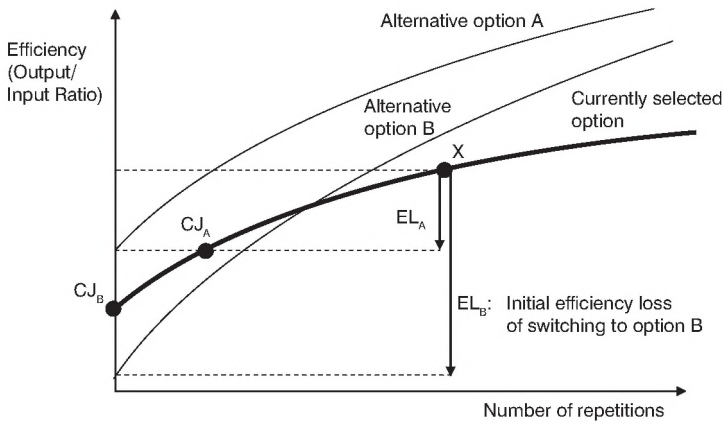


Figure 6. Conceptual illustration of switching costs of other alternative options (the author's own illustration based on: Yelle 1979; Spence 1981; Adler & Clark 1991).

The higher the previous investment in building skills through learning is, the higher the barrier to switch to another option and re-invest in the initial learning. This investment in building up skills is particularly high if the learning to build up these skills occurred at a very low pace and hence with a high time investment. This can lead to a vicious circle of increasing path dependence (Prahalad & Bettis 1986; Freiling et al. 2010) that restricts the organization's flexibility and ability to adapt to its dynamic environment (Freiling et al. 2010). Besides efficiency gains due to repetitions, there may be general challenges associated with organizational learning. Schön and Argyris (1997) describe cognitive limitations in their learning model which prevent reflection on the learning and hence effective skill and experience building. Challenges in this context are single-loop learning, instead of double-loop learning and neglecting 'unlearning' of skills which do not prove to be favorable (Schön & Argyris 1997; Freiling et al. 2010).

### **3.3. Adaptive expectations**

Sydow et al. (2009) describe the concept of adaptive expectations as the adaption of behavior based on the experiences and expectations of other persons' reactions to the behavior. Preferences can vary in response to the expectations of others (Sydow et al. 2009). This behavior can be explained by the uncertainty people face in their decisions and the reduced complexity and feeling of security if other people make similar decisions or show similar behaviors or at least appreciate them. The cause of this behavior is the human "need for social belonging and the desire to end up on the winning side" (Sydow et al. 2009). Individuals are subconsciously afraid of breaking out of the mainstream and being stigmatized as 'outsiders' (Kulik et al. 2008). Since expectations are influenced by others, it can become a self-fulfilling prophecy if everybody does what everybody else does (Sydow et al. 2009). This can result in a self-reinforcing system. If an individual takes a decision to meet the expectations of a group, the group feels its expectations are confirmed and tends to strengthen them. This increases the pressure on subsequent decision makers to behave in a way that conforms to these expectations (Sydow et al. 2009). Due to the resulting determination of decisions, an organization gets more and more path dependent. In the context of entrepreneurship, the founders and their organizations are in constant exchange with other entities and exposed to their behaviors and expectations. Founders adopt behaviors they observe with others and consider them 'best practices' without reflecting if this is the best solution for their individual situation (Freiling et al. 2010). Human beings are also influenced by cognitive biases when estimating expected behavior. For example, people tend to rely more on negative than on positive information (Baron 2004). This fact can lead to distorted reactions of entrepreneurs who are more targeted by negative, e.g., risks, than positive information, e.g., chances. Subsequently entrepreneurs can take exaggerated defensive actions (Freiling et al. 2010). Since resources are scarce especially in the entrepreneurial context, this exaggerated behavior is not efficient and can in extreme cases be a barrier to success (Freiling et al. 2010).

### **3.4. Coordination effects**

A further effect which can lead to path dependence is the coordination effect (Sydow et al. 2009). It describes the influence of predicted reactions on the decision-making behavior. In environments where the actors know each other well and play in well-rehearsed teams, the reactions of the other actors to their own decisions can be predicted. There are implicit or even explicit codes of conducts that lead to rule-guided behavior. By using these rules, the reactions of the other actors are predictable and hence uncertainty is reducible. This decreases complexity and facilitates decision-making (Sydow et al. 2009). Similarly to network effects, using these rules gets more attractive,

more other actors use these rules as well. Coordination effects allow more efficient interaction among these actors and hence coordination costs can be significantly reduced (Sydow et al. 2009). In the context of entrepreneurship, coordination effects can cause escalating commitment and organizational rigidities (Freiling et al. 2010). These can lead to inappropriate adherence to current behaviors and ways of decision-making due to previous experiences of affirmation by various stakeholders like co-founders or investors. This can also distort the evaluation of previous investments of time or other resources. They are no longer considered sunk costs which are irrelevant for future decision-making but show a path of historic approval that seems appropriate to be continued – regardless of whether they were efficient or not. These coordination effects restrict appropriate reactions and adaptation to the market, competition and changing environmental conditions (Freiling et al. 2010). When own decisions follow the rules of a group, this code of conduct gets more and more cemented and triggers further decisions following it. This causes a self-reinforcing effect that narrows down the scope of future decisions and can lead to path dependence (Sydow et al. 2009). An example that radically illustrates this effect is right-hand traffic. Since the reaction of the other actors – in this case, the side of the road they are going to use – can be predicted from historic experiences and rules, it determines the choice of the side of the road the actor will use. Not only the decision is less complex, it also increases efficiency when performing the action of the chosen option because of coordination with others (Sydow et al. 2009). Another example could be working-time regimes. While in Germany a 5-day week is standard, it is the natural choice of most organizations to follow it – without even evaluating if it is the most appropriate choice for their individual situation. In other countries, like India, a 6-day week is standard, with hardly an organization questioning it (Sydow et al. 2009). In case of an option of either a 5-day or a 6-day week, one of the two economies would perhaps be path dependent and stuck with a choice that is not the optimum one due to path dependence.

### **3.5. Complementary effects**

Sydow et al. (2009) also hold complementary effects accountable for developing path dependence. These effects are similar to the concept of economies of scope, which states that two or more goods or services have lower average costs when developed, produced or marketed jointly rather than separately (Panzar & Willig 1981). This effect can also apply to efficiency gains through a combination of production resources. An example in the entrepreneurial context could be the setup of incubator ventures of media companies like ProSiebenSat.1's incubator Epic Companies. It seems likely that such an incubator of a media company supports its venture with its own media channels. Therefore, the venture benefits from the complementary effects of cooperating with the media company and is likely to focus on the

relevant marketing. The more the company aligns its resources towards this strategy, the less flexible it will become to change to alternative partnerships, for example more on the production than marketing side. Prahalad & Hamel (1990) show examples of such cooperation between divisions within one company. For example, companies could combine their marketing skills and R&D capabilities to form their core competence (Pralhad & Hamel 1990). An example that comes to mind when thinking of such a company is Apple. Due to the synergies that can be achieved by different entities working together as an established dream team, deviation from this state involves switching costs (Pralhad & Hamel 1990). The concept of complementary effects illustrated by production synergies applies to products as well. Complementary effects might make a combination of certain goods and/or services or just a combination of particular features within a product very beneficial. An example could be the combination of hardware and software in one product from the same company in the early days of smartphones (Lin & Ye 2009; Kenney & Pon 2011; West & Mace 2010). Sticking to this combination, Nokia found itself in the unfavorable position of high investments in the in-house development of operating systems for their different product models additionally to the hardware development, while traditional software houses like Microsoft and open source movements like Android started developing operating systems only and others like Samsung focused solely on hardware development (Lin & Ye 2009; Kenney & Pon 2011; West & Mace 2010). In the long run, giving up the efficiency gains from the complementary effects might have proved wise. Apple took another approach and leveraged their complementary effects of combined software and hardware development in the personal computer segment to enter the phone market to introduce revolutionary new ways to think about mobile phones and initiated the era of today's smartphones (Lin & Ye 2009; Kenney & Pon 2011; West & Mace 2010).

The previous example illustrates a dilemma businesses can face in view of complementary effects. Leonard-Barton (1992) highlights the paradox of companies which want to leverage their own strengths and build on best practices, but at the same time be innovative. “[T]raditional core capabilities have a down side that inhibits innovation, here called core rigidities” (Leonard-Barton 1992). This rigidity is a sign of the path dependence the company is stuck with. Since the established way of doing things is working so well or at least worked so well in the past, new behaviors, routines and rules are only introduced when they are in line with the current modus operandi and hence further complementary synergies may be expected (Sydow et al. 2009). The more of these informal rules are established additionally, the more the incentives grow to choose a system-conform behavior again. This leads to a self-reinforcement of the complementary effects and supports becoming path dependent. The challenge for companies is to benefit from the efficiency given by their core capabilities, at the same time staying flexible enough to be innovative (Leonard-Barton 1992).



### 3.6. Self-reinforcement

The four effects described above can develop a self-reinforcing mechanism and lead to path dependence. The reasons for these dynamics partly lie in human behavior and decision-making. Emotional reactions like uncertainty avoidance, the need to feel a sense of belonging to a group or to be politically correct and to act according to social desirability play an important role (Sydow et al. 2009). Just like in all human decision-making, cognitive biases like selective perception or confirmation biases are an important factor here as well (Sydow et al. 2009; Kahneman & Tversky 1979). The phenomena of adaptive expectations, coordination effects and complementary effects fall into these categories. On the other hand, learning effects represent a more objective, economic reason to be stuck in the current path. In the short run, sticking to the current practice is often more efficient – independently of potential cognitive distortions. This is similar to other resource-based lock-in situations with high switching costs (Sydow et al. 2009). An example is the use of today's standard keyboards with QWERTY key layout (David 1985). It is not the most ergonomic and efficient way to type and solely results from historic typewriters to prevent the letter levers from jamming. Since generations of people were used to typing with this layout, it was maintained in the electronic age. Switching to a more ergonomic keyboard layout would have been technically possible then and far more efficient, but at the price of switching costs with related initial inefficiency (Sydow et al. 2009). Another example would be the video recording standard VHS, which won over the superior format Beta (Arthur 1990). Due to network effects, the value of a recorder of certain format increases with the number of available tapes in this format (and vice versa). Due to this effect, one system (in this case VHS) reached a tipping point and got on a path towards market domination (Arthur 1990). This example shows how not only a single organization but the whole society is caught in path dependence.

Next, we relate the considerations on path dependence with the entrepreneurial funnel of founding a company.

## 4. Foundation as repeatedly breaking the path

Viewing the entrepreneurial funnel or similar models of entrepreneurial venture creation, it might appear that a path leads through the funnel steps from generally considering becoming an entrepreneur, through generating business ideas, to finally founding a company. As these steps occur in sequence in the process, it may seem that the natural way would be to progress from one step to another and dropping out of a step would be rather an exception. However, it can be argued that the opposite is the case. When applying the concept of path dependence (David 1985; David 2001; Arthur 1989; Arthur 1990; Stack & Gartland 2003; Sydow



et al. 2009) to the entrepreneurial funnel, staying within the funnel is an exception. The path in every single step in the funnel tends to lead out of the funnel. This study assumes that staying in the process and finally becoming a founder requires breaking the path constantly. The following sections will substantiate this thought.

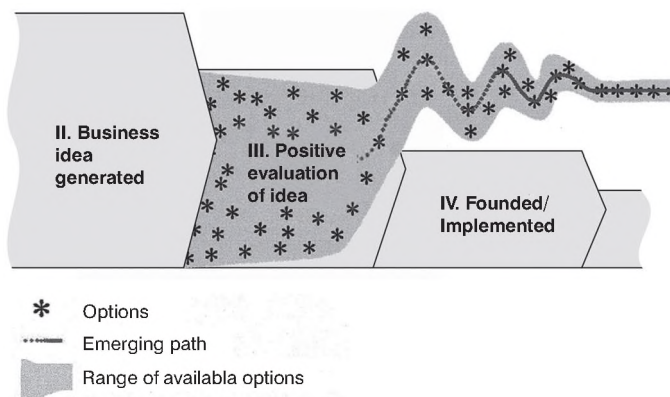


Figure 7. The concept of Path Dependence (Sydow et al. 2009) applied to the Entrepreneurial Funnel.

To understand this surprising phenomenon, the four single effects that lead to path dependence, introduced in the previous section, have to be analyzed: learning effects, adaptive expectations, coordination effects and complementary effects (Sydow et al. 2009). As these effects rest on cognitive and emotional barriers of decision makers, the concept relates to organizations and individuals as well.

#### 4.1. Learning effects

The learning curve is a concept with long history in research (Yelle 1979; Spence 1981; Adler & Clark 1991). Learning effects are based on the fact that “the more often an operation is performed, the more efficiency will be gained with subsequent iterations” (Sydow et al. 2009). As repetition usually creates efficiency, there is an incentive to stick to the same actions as performed before. Whatever an individual has done before, stopping to do it and becoming an entrepreneur is something different and new. Previous experience and subsequent efficiency gains of continuation cannot be used directly when becoming an entrepreneur. This situation can be compared with established companies with a high staff turnover, where new employees enter the company at another level of the learning curve. Research shows that such companies “significantly underperform their rivals” (Hatch & Dyer

2004: 1155). Usually, the longer an individual was in his/her current occupation, the better he/she performed (Spence 1981). This generates opportunity costs and makes it harder to give up this current occupation.

Also, with every change in occupation over time, learning gets more difficult, since „[v]iewed as a learning machine, a man may become less and less productive as he grows older” (Ben-Porath 1970: 153). Changing the occupation might therefore not only require starting at another point of the learning curve but also on a learning curve with a flatter slope (Ben-Porath 1970: 153). This argumentation can be further supported by using theories of human capital which argue that investments in human resources can increase productivity (Werner 2011). A link between the human capital theory and learning effects can be established, since investments in human capital, for example through training programs, can “significantly improve learning by doing, which in turn improves performance” (Hatch & Dyer 2004: 1155). That means that “firm-specific human capital” (Hatch & Dyer 2004: 1155) can increase the slope of the learning curve within a particular company. Starting over as a new venture again comparatively decreases the slope of the learning curve.

The same learning effects apply to the use of heuristics and mental models for decision-making (Prahalad & Bettis 1986). They are also used to reduce complexity in the human brain and lead to higher efficiency in decision-making (Prahalad & Bettis 1986). To engage oneself in an entirely new situation, like becoming an entrepreneur, which requires a totally different mindset can lead to inefficient decision-making. The supposable path is to continue the current situation in the same way as before. Becoming an entrepreneur therefore requires breaking the path.

#### **4.2. Adaptive expectations**

The adaptive expectations effect describes the phenomenon that preferences “vary in response to the expectations of others” (Sydow et al. 2009: 700). Decision makers tend to anticipate what others expect from them and to decide accordingly. They do not want to be “outsiders” who deviate from the group (Kulik et al. 2008). As people usually expect for the future what they experienced in the past, this causes a continuous path (Sydow et al. 2009). Certain best practices evolve in organizations, which is generally not a bad thing, as they might increase competitiveness (Szulanski 1996). Members of the organization tend to follow these best practices in expectation that others would do the same, since they want to be part of the mainstream (Kulik et al. 2008). This adaptation reinforces these best practices, since “[a]daptation creates rules (and even rituals) of behavior” (Luhmann 1995: 122). Before a person becomes an entrepreneur, he/she is in another context, for example in a previous occupation, still in education or even in unemployment. Whatever the previous state is, the potential entrepreneur faces certain expectations of his/her environment. Being in

an employment situation, supervisors, co-workers and even external parties who interact within the business context expect the individual to continue the current occupation. At most, they expect changes within the current organization, for example by being promoted to a superior position or switching to another division. What they do not expect is that the potential entrepreneur leaves the company. Even if the prospective founder is not in an employment situation, his/her environment has certain expectations. When one completes university education, professors, friends and family might expect him/her to get a safe job in an employment situation with a fixed salary and to gather money and work experience. Even though there might be supporters of the idea of starting an own venture, negative opinions might prevail, since cognitive biases often lead human beings to rely more on negative than positive information when estimating expected behavior (Baron 2004). Taking the risk of becoming an entrepreneur right away might distract the social environment of the founder. This is the case also if the entrepreneur has no previous occupation at all and is, for example, coming out of unemployment. The social context, like family and friends as well as authorities, like the employment bureau or social security agencies, expect the individual to find secure employment with a work contract. These examples illustrate that in most thinkable situations the potential entrepreneur could come out of before founding, the social environment has strong expectations of the individual not to become an entrepreneur. If the prospective founder still does so, he/she does not live up to his/her peers' expectations and takes the risk of becoming an 'outsider' of his/her social group (Kulik et al. 2008). It is also hard to build up a new social group whose expectations support entrepreneurship at the moment of taking the decision to found. This is because the founder just starts to be an entrepreneur and probably has not yet built up a strong network in the entrepreneurial community. Also shortly after foundation, it might be hard to build up a new social group where he/she can feel as an 'insider' again, because usually the founder is quite alone at the top of his/her company. His/her employees are in another social context, as they are not founders. To find real peers who can support his/her entrepreneurial decisions, he/she would have to reach out to other founders or mentors. The above argument shows that taking the decision to found, actually founding and being an early entrepreneur requires ignoring the expectations of others and not adapting to them. This means that the natural path leads out of the entrepreneurial funnel at this stage and staying within the process and becoming an entrepreneur requires breaking the path.

### **4.3. Coordination effects**

Coordination effects describe the phenomenon that sticking with established teams and processes makes the outcomes predictable and hence more efficient and comfortable. Implicit or explicit rules facilitate coor-

dination among different people the more, the more people use them (North 1990; Sydow et al. 2009). This creates a “[m]ore efficient interaction among these actors” (Sydow et al. 2009: 699) and hence “coordination costs can be significantly reduced” (Sydow et al. 2009: 699). In his/her previous occupation, the prospective entrepreneur benefited from this coordination and the resulting synergies and cognitive confirmation. He/she comes out of a professional as well as private social situation that is well-rehearsed and he/she knows the way to behave in this context. In the situation of entrepreneurship, this effect can cause escalating commitment towards the current choice of decisions and actions (Freiling et al. 2010). This does not only apply to a new venture in a start-up company but also an innovative venture within an established company. Sydow et al. (2009) connect such examples to coordination effects of path dependence. For example, newspaper companies which were too much locked in their rigid routines to capture opportunities in the online market (Gilbert 2005) or the photo company Polaroid, which did not manage to reallocate its R&D structures towards the development of a new product suited to the new market requirements (Tripsas & Gavetti 2000). The same may be the case in an employment situation and lead to sticking to the current occupation. Often employees have developed a certain feeling over time which behavior in the job is appreciated and leads to acceptance and success and which does not (Sydow et al. 2009). Becoming an entrepreneur, the prospective founder has to give up this efficient, predictable context and move into an unknown territory. This step is even harder than just switching jobs to a new company, because as a new company already exists, there are these unwritten rules and cultural behavior guidelines already in place (Luhmann 1995; Szulanski 1996). They just have to be learned and adapted to, but not newly developed. In a new venture, however, usually there is no established team and also the cultural and organizational environment within the start-up is yet to be created. Therefore, there are no explicit or implicit rules and codes of conduct that would give guidelines on how to behave and how to take decisions. All the coordination has to be built up from scratch. This increases not only uncertainty but also pure effort. These coordination effects incentivize the potential entrepreneur to stay in his/her previous well-rehearsed situation and not take the step to give up this developed efficiency by starting a new venture. Again, this self-reinforcing effect creates path dependence with the obvious path leading out of the entrepreneurial funnel. Staying within the process and finally becoming an entrepreneur requires breaking the path.

#### **4.4. Complementary effects**

Complementary effects mean that a combination of certain input factors, processes or output factors can create additional value due to ‘economies of scope’ (Panzar & Willig 1981). The whole entity can be more than just

the sum of the parts. This could apply to two or more single employees or business divisions working together as an established ‘dream team’ (Sydow et al. 2009). The same holds when certain products or services are provided as an entire solution rather than providing them stand-alone – at a lower level of efficiency (Panzar & Willig 1981; Sydow et al. 2009). This leads to a situation where new rules and behaviors are only introduced if they are in line with the current practices and therefore are complementary (Sydow et al. 2009; Freiling et al. 2010). The complementary effect could simply be a combination of the workplace and the employee. A young investment banker directly coming from university might earn a very high salary right from the start. No matter how smart he/she is, it is not very likely that he/she would achieve such a high initial income in any other industry or by being self-employed. Vice versa, the investment bank would not be able to generate such high revenues to be able to pay these salaries without smart and motivated graduates. In this example, the workplace of the investment bank and the individual graduate complement each other to develop a high value. The synergies are caused by separate but interrelated resources (Pierson 2000; Stieglitz & Heine 2007). A potential entrepreneur can take advantage of these complementary effects in his/her previous occupation. Having other components provided by the organization reinforces the impact of the own components. These could be input factors like a well-established cooperation between two divisions. For example, a strong market research department could boost the efficiency and effectiveness of the market communication department by providing them with exact descriptions of target groups, thus allowing creating perfectly targeted advertising messages (Prahalad & Hamel 1990). These could also be output factors that reinforce each other in sales. For example, a strong research and development and production division of batteries could complement the division of power units of an automotive OEM in the development of electrical cars. There might be no particular separate demand for high capacity batteries but in the combination with an electrical car they get a whole new meaning and value. Vice versa, the electrical car might have a superior design and power unit, but the value increases considerably if a market leading battery quality can be offered additionally. David refers to such fruitful combinations as “institutional clusters” (David 1994: 214). These interactions determine a path of sticking to the current complementary entities, which are getting increasingly dominant as action patterns (Leonard-Barton 1995). When a potential entrepreneur leaves such established clusters, he/she has to leave the resulting benefits behind. Complementary units have to be built up from scratch in a newly founded venture. Therefore, complementary effects tend to force a prospective entrepreneur to stay on the current path and continue his/her previous occupation. Implementing his/her idea and actually founding a company requires breaking this path.

#### 4.5. Path dependence in the single steps of the Entrepreneurial Funnel

The investigation of the self-reinforcing effects that can lead to path dependence (Sydow et al. 2009) shows that all of them counteract becoming an entrepreneur. However, so far the discussion above has mainly focused on changing from an employee position to self-employment, so on the overall entrepreneurial process. However, it can also be applied to the single steps within the entrepreneurial funnel. While no irreversible steps have been taken to start an own venture, for example quitting the previous job, a potential entrepreneur always has the fallback option of discarding his/her idea of founding a company and continuing with his/her current occupation (McGrath 1999). Therefore, for every funnel step before the actual foundation of a company (funnel steps 0–IV), the above arguments can be made to support the thought of the dependent path leading out of the funnel. The most crucial one here is the transition from step III (“Positive evaluation of idea”) to step IV (“Founded/Implemented”), as this move might likely create hardly reversible facts. However, also reaching the next step (“V. Profitable”) can be hindered from the perspective of path dependence, since the entrepreneur always has the chances to give up his/her currently chosen path of running an own venture and return to an occupation similar to his/her previous one. From the viewpoint of real options reasoning, the entrepreneur can constantly weigh up his/her different options and turn to a more favorable one (McGrath 1999). So if the company does not immediately show the desired results, the entrepreneur has to withstand a dry spell in his/her venture and he/she can abandon his/her company and turn to another available option of occupation (McGrath 1999). There are also opposing views of real options thinking in the entrepreneurial context. Landier (2006) argues that entrepreneurs often have a highly subjective evaluation of the current performance and future prospects of their venture. They often overvalue the impact of a failure and the related feared stigma of failure (Ullrich 2013; Landier 2006; McGrath 1999) and hence hold on to start-ups, even though they are not promising any more (Landier 2006). This finding further supports the thought of path dependence towards failure, as it describes a situation where an entrepreneur who already founded a company (step “IV. Founded/Implemented”) does not reach the subsequent step (“V. Profitable”). Due to the irrational hesitance to terminate the project and start over again with a more promising option (Landier 2006), for example going back to the previous occupation or starting again with another business idea, he/she fails to reach the next step.

The argument above concludes in supporting the idea that moving through the entrepreneurial funnel requires leaving the predetermined path repeatedly. This might be counterintuitive, because the steps of becoming



an entrepreneur from the process point of view seem to automatically follow one another subsequently. However, in reality, moving all the way through the process is rather an exception. The following figure illustrates this circumstance.

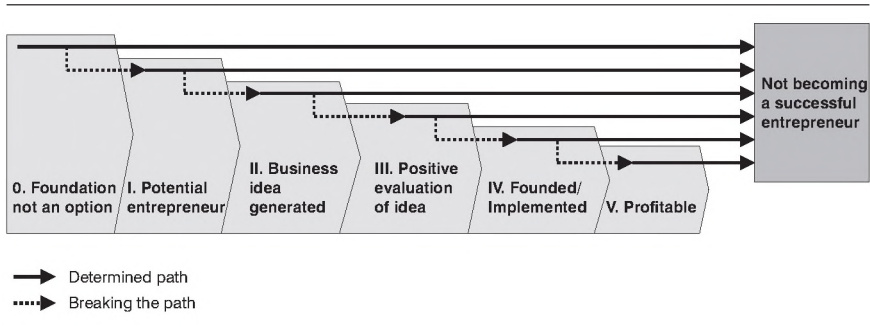


Figure 8. Path Dependence in the different steps of the Entrepreneurial Funnel.

## 5. Conclusions

The concepts of path dependence have a long history in research (David 1985; David 2001; Arthur 1989; Arthur 1990; Stack & Gartland 2003; Sydow et al. 2009). In the entrepreneurial context, so far they have been mainly applied to understand success and failure of existing ventures. Sydow et al. (2009) presented an appealing line of reasoning in this context. This study built on their arguments, but applied the concept of path dependence of the process of venture creation as a path-breaking process to explain why some potentially promising ventures are not founded in the first place.

The findings of this study trigger the discussion that moving through the entrepreneurial process might not be a natural sequence, but instead principles of path dependence (David 1985; David 2001; Arthur 1989; Arthur 1990; Stack & Gartland 2003; Sydow et al. 2009) lead entities out of the process at each step. Staying in the process and founding a company and making it successful hence might require multiple breaches of the determined path. This insight opens up a new perspective on why it is so hard to start a new company.

It also raises the question if measures to overcome path dependence can be used to facilitate moving through the entrepreneurial process. To regain the flexibility in line with the available choices, a path dependent organization in Phase III has to break the path (Sydow et al. 2009). The aim can be either to return to the full set of choices of Phase I, to just broaden the corridor of available choices, or to generally accept the path dependence but at least try to switch to another, more favorable path.



Breaking the path means leaving the current patterns of decision-making and actions behind. This is not an easy endeavor, as the causes are often emotional and cognitive barriers, as described above, which are hard to overcome (Sydow et al. 2009). External impulses might be required to change the lens through which to look at things and evaluate the current situation. For organizations, this outside impulse could be, e.g., advice from external consultants or newly hired management staff. For individuals, these could be mentors or coaches (Kets de Vries 2006). To cope with emotional barriers, individuals might need psychological and psychoanalytical approaches (Sydow et al. 2009; Kets de Vries 2006) such as Neuro Linguistic Programming (NLP) tools like reframing (Bandler et al. 1982) or psychoanalytical leadership coaching (Kets de Vries 2006).

Further research should conceptually follow up on the initiated discussion that moving through the entrepreneurial process might require breaking a determined path repeatedly, as it brings a new perspective to both concepts of entrepreneurial process and path dependence. A starting point here could be an investigation of the corresponding success and failure causes in every single step of the entrepreneurial process to draw connections to the mechanisms of path dependence. Future research should further intensify the quantification of the entrepreneurial funnel. A representative quantification would allow calculating the chances for a single entrepreneur to proceed from each one to the next funnel step and thereby identify the most important leaks in the pipeline towards becoming a successful entrepreneur.

## References

- Adler, P.S. & Clark, K.B. (1991). Behind the learning curve: A sketch of the learning process. *Management Science*, 37(3), 267–281.
- Arthur, W.B. (1989). Competing Technologies, Increasing Returns, and Lock-In by Historical Events. *The Economic Journal*, 99(394), 116–131.
- Arthur, W.B. (1990). Positive feedbacks in the economy. *Scientific American*, 262(2), 92–99.
- Bandler, R., Grinder, J. & Andreas, S. (1982). *Neuro-Linguistic Programming™ and the Transformation of Meaning*. Moab: Real People.
- Baron, R.A. (2004). The cognitive perspective: a valuable tool for answering entrepreneurship's basic "why" questions. *Journal of Business Venturing*, 19(2), 221–239.
- Ben-Porath, Y. (1970). The production of human capital over time. In: *Education, income, and human capital*. NBER, 129–154.
- Berger, P.K. (2014). *The Role of Fear for Entrepreneurial Venture Creation Causes of Failure before and after Foundation*. Wiesbaden: Springer Fachmedien Wiesbaden GmbH.
- Bhave, M.P. (1994). A process model of entrepreneurial venture creation. *Journal of Business Venturing*, 9(3), 223–242.
- Brixy, U., Sternberg, R. & Vorderwülbecke, A. (2011). *Global Entrepreneurship Monitor – Unternehmensgründungen im weltweiten Vergleich – Länderbericht Deutschland 2011*, Available at: [http://www.wigeo.uni-hannover.de/fileadmin/wigeo/Geographie/Forschung/Wirtschaftsgeographie/Forschungsprojekte/laufende/GEM\\_2011/gem2011.pdf](http://www.wigeo.uni-hannover.de/fileadmin/wigeo/Geographie/Forschung/Wirtschaftsgeographie/Forschungsprojekte/laufende/GEM_2011/gem2011.pdf) [Accessed June 17, 2012].

- Brüderl, J., Preisendörfer, P. & Ziegler, R. (1992). Survival chances of newly founded business organizations. *American sociological review*, 227–242.
- Chandler, G.N. & Jansen, E. (1992). The founder's self-assessed competence and venture performance. *Journal of Business venturing*, 7(3), 223–236.
- Cooper, A.C., Gimeno-Gascon, F.J. & Woo, C.Y. (1994). Initial human and financial capital as predictors of new venture performance. *Journal of business venturing*, 9(5), 371–395.
- Cooper, A.C., Woo, C.Y. & Dunkelberg, W.C. (1988). Entrepreneurs' perceived chances for success. *Journal of business venturing*, 3(2), 97–108.
- David, P.A. (1985). Clio and the Economics of QWERTY. *The American economic review*, 332–337.
- David, P.A. (2001). Path dependence, its critics and the quest for “historical economics”. In: P. Garoust & S. Iannoides (eds). *Evolution and path dependence in economic ideas: Past and present* (pp. 15–40). Cheltenham: Edward Elgar.
- David, P.A. (1994). Why are institutions the “carriers of history”? Path dependence and the evolution of conventions, organizations and institutions. *Structural change and economic dynamics*, 5(2), 205–220.
- European Commission (2012). *Effects and impact of entrepreneurship programmes in higher education*. Brussels: Entrepreneurship Unit, DG Enterprise and Industry. Available at: [http://ec.europa.eu/enterprise/newsroom/cf/\\_getdocument.cfm?doc\\_id=7428](http://ec.europa.eu/enterprise/newsroom/cf/_getdocument.cfm?doc_id=7428) [Accessed July 23, 2013].
- Fiet, J.O. (2001). The pedagogical side of entrepreneurship theory. *Journal of Business Venturing*, 16(2), 101–117.
- Freiling, J., Laudien, S.M., Schmidt, M., Wessels, J. (2010). *Entrepreneurial failure in the spotlight of the entrepreneurship theory*. In 7th AGBA Annual World Congress. Putrajaya (Malaysia).
- Fritsch, M., Brixy, U. & Falck, O. (2006). The Effect of Industry, Region, and Time on New Business Survival – A Multi-Dimensional Analysis. *Review of Industrial Organization*, 28(3), 285–306.
- Fritsch, M. & Weyh, A. (2006). How Large are the Direct Employment Effects of New Businesses? An Empirical Investigation for West Germany. *Small Business Economics*, 27(2–3), 245–260.
- GfK (2012). *Amway European Entrepreneurship Report 2012 – Unternehmerisches Potenzial für den Arbeitsmarkt der Zukunft*. München. Available at: <http://www.zukunftselbststaendigkeit.de> [Accessed October 12, 2013].
- Gilbert, C.G. (2005). Unbundling the structure of inertia: Resource versus routine rigidity. *Academy of Management Journal*, 48(5), 741–763.
- Gompers, P. et al. (2006). *Skill vs. luck in entrepreneurship and venture capital: Evidence from serial entrepreneurs*. National Bureau of Economic Research. Available at: <http://www.nber.org/papers/w12592> [Accessed June 11, 2014].
- Hagen, T., Kohn, K. & Ullrich, K. (2011). KfW-Gründungsmonitor 2011. Dynamisches Gründungsgeschehen im Konjunkturaufschwung. *Jährliche Analyse von Struktur und Dynamik des Gründungsgeschehens in Deutschland, Frankfurt/M.*
- Handelsblatt & dpa (2012). Baumärkte: Praktiker kommt aus Problemen nicht heraus – Handel + Dienstleister – Unternehmen – Handelsblatt. *Handelsblatt*. Available at: <http://www.handelsblatt.com/unternehmen/handel-dienstleister/baumaerkte-praktiker-kommt-aus-problemen-nicht-heraus/6022442.html> [Accessed April 1, 2013].
- Hatch, N.W. & Dyer, J.H. (2004). Human capital and learning as a source of sustainable competitive advantage. *Strategic management journal*, 25(12), 1155–1178.
- Jo, H. & Lee, J. (1996). The relationship between an entrepreneur's background and performance in a new venture. *Technovation*, 16(4), 161–211.
- Kahneman, D. & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263–291.

- Kaiser, S. (2013). Baumarktkette Praktiker: Mit Billig-Image in die Insolvenz – SPIEGEL ONLINE. *Spiegel Online*. Available at: <http://www.spiegel.de/wirtschaft/unternehmen/baumarktkette-praktiker-mit-billig-image-in-die-insolvenz-a-910641.html> [Accessed September 25, 2013].
- Kelley, D.J., Singer, S. & Herrington, M.D. (2010). The Global Entrepreneurship Monitor 2010. Available at: [http://www.gemconsortium.org/assets/uploads/1330429931GEM\\_2011\\_Global\\_Report\\_-\\_EDIT\\_FEB\\_2012.pdf](http://www.gemconsortium.org/assets/uploads/1330429931GEM_2011_Global_Report_-_EDIT_FEB_2012.pdf) [Accessed January 20, 2013].
- Kelley, D.J., Singer, S. & Herrington, M.D. (2011). The Global Entrepreneurship Monitor 2011. Available at: <http://155.48.10.202/Academics/centers/blank-center/global-research/gem/Documents/GEM%20Global%202011%20Report.pdf> [Accessed July 3, 2012].
- Kenney, M. & Pon, B. (2011). Structuring the Smartphone Industry: Is the Mobile Internet OS Platform the Key? *Journal of Industry, Competition and Trade*, 11(3), 239–261.
- Kets de Vries, M.F.R. (2006). *The leader on the couch: a clinical approach to changing people and organizations*. San Francisco CA: John Wiley & Sons Ltd.
- Kulik, C.T., Bainbridge, H.T.J. & Cregan, C. (2008). Known by the Company We Keep: Stigma-By-Association Effects in the Workplace. *Academy of Management Review*, 33(1), 216–230.
- Landier, A. (2006). *Entrepreneurship and the Stigma of Failure*. Unpublished manuscript.
- Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13(S1), 111–125.
- Leonard-Barton, D. (1995). *Wellsprings of knowledge: Building and sustaining the sources of innovation*. Harvard Business Press.
- Lin, F. & Ye, W. (2009). *Operating System Battle in the Ecosystem of Smartphone Industry*. In International Symposium on Information Engineering and Electronic Commerce. Ternopil: IEEE, pp. 617–621. Available at: <http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=5175193> [Accessed June 15, 2014].
- Luhmann, N. (1995). *Social systems*. Stanford University Press.
- McGrath, R.G. (1999). Falling forward: Real options reasoning and entrepreneurial failure. *Academy of Management review*, 24(1), 13–30.
- North, D.C. (1990). *Institutions, institutional change, and economic performance*. Cambridge ; New York: Cambridge University Press.
- Panzar, J.C. & Willig, R.D. (1981). Economies of scope. *The American Economic Review*, 71(2), 268–272.
- Pierson, P. (2000). Increasing returns, path dependence, and the study of politics. *American political science review*, 251–267.
- Prahalad, C.K. & Bettis, R.A. (1986). The dominant logic: A new linkage between diversity and performance. *Strategic Management Journal*, 7(6), 485–501.
- Prahalad, C.K. & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79–91.
- Sánchez López, A.M. (2012). *The venture creation process in Puerto Rico: From entrepreneurial potential to firm birth*.
- Schön, D.A. & Argyris, C. (1997). Organizational learning: a theory of action perspective. *Reis: Revista española de investigaciones sociológicas*, (77), 345–350.
- Spence, A.M. (1981). The learning curve and competition. *The Bell Journal of Economics*, 49–70.
- Stack, M. & Gartland, M.P. (2003). Path creation, path dependency, and alternative theories of the firm. *Journal of Economic Issues*, 487–494.
- Stieglitz, N. & Heine, K. (2007). Innovations and the role of complementarities in a strategic theory of the firm. *Strategic Management Journal*, 28(1), 1–15.
- Stuart, R.W. & Abetti, P.A. (1990). Impact of entrepreneurial and management experience on early performance. *Journal of Business Venturing*, 5(3), 151–162.

- Sydow, J., Schreyögg, G. & Koch, J. (2009). Organizational path dependence: Opening the black box. *Academy of Management Review*, 34(4), 689–709.
- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic management journal*, 17(WINTER), 27–43.
- Teece, D.J. et al. (1994). Understanding corporate coherence: Theory and evidence. *Journal of Economic Behavior & Organization*, 23(1), 1–30.
- Tripsas, M. & Gavetti, G. (2000). Capabilities, cognition, and inertia: Evidence from digital imaging. *Strategic management journal*, 21(10–11), 1147–1161.
- Ullrich, K. (2013). *Hemmnisse im Gründungsprozess – Gründer und verhinderte Gründer*. Frankfurt am Main: KfW Bankengruppe, Abteilung Volkswirtschaft. Available at: [https://www.kfw.de/media/download\\_center/konzernthemen/research/pdf\\_dokumente\\_studien\\_und\\_materialien/Gruendungshemmnisse\\_April\\_2013.pdf](https://www.kfw.de/media/download_center/konzernthemen/research/pdf_dokumente_studien_und_materialien/Gruendungshemmnisse_April_2013.pdf) [Accessed May 6, 2013].
- Watson, J. & Everett, J. (1993). Defining Small Business Failure. *International Small Business Journal*, 11(3), 35–48.
- Werner, A. (2011). *Abbruch und Aufschub von Gründungsvorhaben: Eine empirische Analyse mit den Daten des Gründerpanels des IfM Bonn*. IfM-Materialien.
- West, J. & Mace, M. (2010). Browsing as the killer app: Explaining the rapid success of Apple's iPhone. *Telecommunications Policy*, 34(5–6), 270–286.
- Yelle, L.E. (1979). The learning curve: Historical review and comprehensive survey. *Decision Sciences*, 10(2), 302–328.