



ORGANIZED
CREATIVITY

Organized Creativity Discussion Paper
No. 18/5

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A case study in pharmaceutical innovation

Berlin, October 2018
ISSN 2626-7217 (online)



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ISSN 2626-7217 (online)

URL: <http://www.wiwiss.fu-berlin.de/forschung/organized-creativity/discussion-paper01>

Berlin, August 2016

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The generative properties of secrecy in idea development. A case study in pharmaceutical innovation

Abstract

This paper intends to illuminate the dynamic and generative role of (in)formal secrecy in pharmaceutical innovation. More particularly, this study is interested in the question how knowledge protection influences and affects the creative process of idea generation. Does the need to protect promising ideas hinder and impede knowledge exchange and innovative capacities or can secrecy mechanisms, in fact, be productive for creativity? The case study of the development of a biopharmaceutical drug based on interviews with the involved scientists shows that secrecy is not only effective in order to prevent the loss of a pre-defined, already existing valuable idea as the property of an organization or a group of individuals. Instead, we found secrecy generative in various overlapping and intersecting modes that affected the idea as well as its valuation. Thus, moving beyond functionalist approaches concerned with the effectiveness of a given secrecy mechanism to protect valuable information, this study highlights the social dynamics and effects of the relationship between creativity and secrecy in innovation processes.

Keywords

secrecy, creativity, idea trajectory, innovation, pharmaceutical industry, trust, value

Acknowledgement

First and foremost, I am very grateful for my interview partners at BedroPharm¹ for taking the time to let me take part of their fascinating idea journey. I would also like to thank Prof. Dr. Jana Costas (European University Viadrina, Frankfurt/O.), Prof. Dr. David Stark (Columbia University, New York City) and Prof. Dr. Jörg Sydow (Free University, Berlin) for supporting and commenting on this work. I would also like to thank German Research Foundation (DFG) for their funding to make this research possible.

Introduction

How do (in)formal secrecy promote or hamper the idea journey in pharmaceutical development? What modes of secrecy play a role, and at which stages? What are their functions and (unexpected) effects? While the successful management of appropriability regimes – the scope within which knowledge and innovations can be protected from imitators (Henttonen et al., 2016) – are part and parcel of the daily work of scientists in pharmaceutical innovation, little is known about how these processes affect the idea as such (Courpasson and Younes, 2018). Most studies in management and organization focus on formal mechanisms of knowledge protection such as IP laws and trade secrets, and view secrecy as a static mechanism to protect an identified, fixed and valuable piece of information (e.g. [Liebeskind, 1997](#); [Bos et al., 2015](#)). Informed by sociologically-informed approaches to secrecy as a social process (Costas and

¹ I have replaced all names of individuals and organizations with pseudonyms. All information that may have provided hints as to the identity of persons and organizations have also been omitted or replaced to avoid the identification of the organizations and persons involved.

Grey, 2016; see also Simmel, 1906), this paper explores the various secrecies involved in creative processes and their (un)intended effects on the idea. In so doing, this case study discusses the trajectory of a highly promising lead compound currently in phase 2 of the pharmaceutical development process to treat a particular fatal condition. Based on interviews with the involved scientists, managers, financiers and partners, this study firstly identifies various moments that played a crucial part in the 'idea journey' (i.e. idea spark, maturation, development, validation and championing) (Perry-Smith and Mannucci, 2017). Secondly, the study explores the various intersecting modes of formal and informal secrecies (Costas and Grey, 2016) that condition and shape these moments. Supporting other recent observations (Courpasson and Younes, 2018; Criscuolo et al., 2014; Malik et al., 2018), this case shows that working on an idea in a confidential setting can, in fact, evoke and catalyze creative processes. This becomes evident, for example, in the case of sparking ideas in exclusive meetings because they allow a particular freedom for divergent thinking while at the same time providing a safe and trusted space for discussion. In addition to existing studies, this study also finds that secrecy in creative processes is *not* necessarily only a single event of 'creative deviance' (Mainemelis, 2010) or a 'state of exception' (Courpasson and Younes, 2018) that employees purposefully generate to keep a promising idea alive. Instead, the case study shows how the creative process is shaped, solidified and contested by various intersecting and overlapping modes of formal and informal secrecies that have an effect on whether and how the idea is valued (Piot, 1993). Thus, secrecy can be considered a generative practice that constitutes the novelty and value of the idea as such.

Secrecy in innovation processes unfolded

Most of management and organization literature on secrecy cites Teece's seminal article on appropriability regimes and the question of how innovators can avoid their competitors and imitators profiting more from their innovation than they themselves (Teece 1986, p. 285). In this literature, the guiding assumption is that firms gain a competitive advantage only by appropriating value from knowledge that can be protected from competitors. Thus, the firms' incentive to invest in innovation is, according to this theory, directly related to its protective capacities (Liebeskind, 1997). Patenting is thereby the most obvious protection mechanism. However, patents are not always suitable for all ideas, as they tend to be narrow, costly and often weak or ineffective in practice (James et al., 2013, p. 1123; Dufresne and Offstein, 2008; Liebeskind, 1997; Di Stefano et al.; Arundel, 2001). Alongside lead time, and complementary assets, many writers identify secrecy as one of the most important appropriability mechanisms in innovation processes (Bos et al., 2015; Hannah, 2005; Henttonen et al., 2016; James et al., 2013; Teece, 1986). Despite the importance of secrecy to protect valuable ideas, it is a complex and vulnerable process, which is increasingly difficult to manage due to factors such as employee mobility, digitalization of content, social media, and the need for collaboration (Bos et al., 2015, p. 2619).

Trade secrets, nondisclosure agreements, non-competition agreements, codes of conduct, rules (such as prohibition of communication), and structural isolation constitute direct and formal modes of protection. More indirect modes of protection are achieved through fair compensation to restrict employee mobility, compartmentalization of the secret amongst different employees, or fostering a disciplined culture through trainings for employees (Bos et al., 2015, p. 2646; James et al., 2013; Liebeskind, 1997). Dependent on the type of industry, organization, IP regime or kind of innovation that influences the effectiveness of each of these protection mechanisms (Bos et al. 2014, p. 2622), the advantages of secrecy are lower costs, extra time and its suitability as a protection mechanism in cases in which knowledge is not yet codified (as compared to patents). The greatest disadvantage of such protection mechanisms is the secrecy's continuous risk of leakage and restricting the flow of information in collaboration (Bos et al., 2015; Liebeskind, 1997; James et al., 2013).

There is a popular consensus, which is also reflected in the literature, that negative effects on organizational processes (e.g. lowering employee moral) are a necessary evil for creativity and innovation (James et al., 2013; Liebeskind, 1997). As firms attempt to withhold or compartmentalize information to protect it, such practices are assumed to reduce R&D efficiency by restricting internal ('reinventing the wheel') and external knowledge transfer ('missing opportunities') (James et al., 2013, p. 1132). Particularly in radical innovation processes that require manifold exchanges, patenting protection appears more desirable (Bos et al., 2014, p. 2621). Moreover, secrecy still carries negative connotations in relation to illegitimacy (De Maria, 2006), clandestine organizations (Stohl and Stohl, 2011), knowledge hiding or silence to cover up wrongdoing, unethical practices or mistakes (Connelly et al., 2012; Milliken et al., 2003).

Yet, as an increasing demand to be open and act transparently becomes a predominant social norm in organizations and innovation processes across organizational boundaries (Birchall, 2011), more attention has also been paid to secret and clandestine practices in and of organizations. Beyond the dysfunctional perspective on secrecy as an obstacle for knowledge exchange or 'cover up' for wrongdoing, these contributions highlight that secrets are not only often ethical and necessary for effective organizational functioning (Anand and Rosen, 2008; Costas and Grey, 2016; Dufresne and Offstein, 2008), they also show how secrecy may in fact be productive for creativity. Studies on the relation between creativity and organization show that working in secret and violating managerial orders (e.g. bootlegging, 'going underground') can be a company-committed and highly productive activity. The deviant behavior is often a proactive response in order to keep working on a promising idea if managers seem unsupportive of the idea (Courpasson and Younes, 2018; Criscuolo et al., 2014; Mainemelis, 2010; Malik et al., 2018). For example, Criscuolo et al. (2014, p. 1287) argue "that individuals' bootleg efforts are associated with achievement of high levels of innovative performance" because embryonic ideas are not as quickly dismissed as result of managerial scrutiny. Also, Haas and Park highlight that norm violation can occur "when professional norms are valued but it is difficult to ascertain the appropriate course of professional conduct" (Haas and Park, 2010, p. 873). Courpasson and Younes (2018), however, criticize these studies on the grounds that they consider creativity only as the effect of the isolated behavior of particular creative champions. Instead, their case study highlights the social character of secrecy *and* creativity and finds that working in secret increases commitment, cohesion and efficiency amongst the secret group, precisely because of the exceptional situation in which the group finds itself. Their sense of responsibility and vulnerability leads to intensified work relationships that catalyze creativity to achieve a common purpose.

To sum up, functionalist approaches of appropriability regimes are concerned with the question of the effectiveness and conditions of secrecy as a value capturing mechanism. Here, secrecy is defined as a protective function to avoid loss. It assumes that knowledge is only valuable if it is privately held and represents a static view on the content of the secret, as something that is clearly identified and already valuable. As Costas and Grey (2016) have pointed out, this approach does not take into account sociological and anthropological insights on the social and symbolic power of secrecy. For secrecy has more functions and effects than protecting a particular idea. It is, for example, also a signaling practice that can make certain ideas appear valuable *because* they are secret, and it has social and organizational effects in relation to power, group formation, and identity (e.g. Simmel, 1906; Canetti, 1984; Bok, 1989; Piot, 1993; Horn, 2011). This raises questions as to the generative capacities of secrecy as a social practice; a practice that should be considered at least among others in creative processes (Fortwengel et al., 2017). Secondly, and this includes the above-mentioned studies that view secrecy as a productive and collective endeavor, keeping a secret is usually considered in a static way. Secrecy is mostly considered as a single event, such as a 'state of exception' (Courpasson and Younes, 2018), a deviant practice (Mainemelis, 2010), or as a single (one-time) decision for a particular type of protection mechanism, which creates (permeable) boundaries with selected openings (Costas and Grey, 2016). Such a static view of secrecy fails to ask how secrecy requires a dynamic and continuous management process (Bos et al., 2014, p. 2619) that consists

of various overlapping modalities of *secrecies*, which are constituted in relation to uncertainties that emerge throughout the entire innovation process.

Rather than defining secrecy as ‘a protection mechanism’ as it ‘refers to a firm’s effort to protect the uniqueness of an innovation by withholding its technical details from public dissemination’ (James et al., 2013, p. 1126), this study aims to broaden the secrecy perspective by drawing on Costas and Grey's (2014, p. 1423) definition of organizational secrecy as “the ongoing formal and informal social processes of intentional concealment of information from actors by actors in organizations”. This allows us to expand the notion of secrecy in management and organization studies beyond the commonly assumed legal and rule based options and hence moves the analytical lens beyond the official realm of an organization by including the role of social activities and relationships (Costas and Grey, 2014, p. 1424; Courpasson and Younes, 2018). Considering secrecy as generative of social interactions (rather than an organizational protection mechanism), this perspective allows us to take into account issues of gossip (Clegg and van Iterson, 2009; Noon and Delbridge, 1993; Puyou, 2018), social control (Di Stefano et al., 2014; Loshin, 2007), and trust (Grey and Garsten, 2001; Oliver, 2009) in innovation processes, including their generative effects on how the idea as such is constituted and valued.

Method: Being transparent about secrecy

Despite, or, precisely because of its ubiquity in organizations, studying secrecy is a paradoxical endeavor (Costas and Grey, 2016; Keane, 2008). While the goal of research is to observe in detail, interpret and ultimately publish knowledge, the nature of the secret is to keep knowledge concealed. Instances of secrecy are by their very nature difficult to identify and depend highly on privileged access to and trust relationships with informants (Courpasson and Younes, 2018). At the same time, as the anthropologist Bellman points out, “it is the very nature of secrets that they get told” (Bellman, 1981: 1). Moreover, the need for a particular protection mechanism is also proof for the idea being valuable (Simmel, 1906; Canetti, 1984).

This case study is part of a larger and publicly funded research project on comparing the role of secrecy in creative processes in the music industry (arts-based creativity) and pharmaceutical industry (science-based creativity). When approaching informants, I was open about my interest in secrecy – not as an inherently problematic but instead as an integral part of the everyday life of organizational practices. Given the large sums of money, the long-term duration and the high risk involved in the development of pharmaceutical products, the industry is heavily governed by ‘regimes of appropriability’ that shape the R&D process (Hannah, 2005; Teece, 1986). Thus, for R&D scientists in pharmaceutical development, formal secrecy, as in trade secrets, patents, and confidentiality agreements, is in fact a mundane practice that is part and parcel of their everyday working lives.

As a methodological tool, I approached interviewees with the intention of creating an ‘innovation biography’ (Butzin, 2013) of their idea with a particular interest in the confidentiality involved. I approached informants to, firstly, narrate their idea journey and highlight particularly creative moments. Secondly, I asked how formal and informal secrecy mechanisms affect their innovative capacities (e.g. what mechanisms did you employ, when do you start sharing a new idea, with whom, and how?). I was less interested in the nature of the secret as such, and informants were also less willing to talk about concrete details regarding the specifics of their idea. It turned out that they usually expressed pride in their necessity for secrecy mechanisms, as this appeared to be an indicator of the worth of their idea. They were also open to talking about the inefficiency of formal ways of protection and how they find alternative ways to protect an idea.

After an explorative research phase with 29 interviews of scientists, managers and experts of the pharmaceutical industry, *BedroPharm* promised to be a suitable in-depth case study, as the company's idea development process is relatively progressed compared to other firms with a similar size. Moreover, and even more importantly, as the core group of the company had not changed since its inception ten years ago, it was possible to interview key people who were involved throughout the complete process. While this case study is still ongoing, I have currently gathered four interviews with three of the core group (two with the company owner,

one each with the head of development and chief medical officer) and with one of the firm's partner (a representative of biotech company, who produced the anti-body for *BedroPharm*). The current paper is based on these first interviews and an extensive desk study of the company information provided on the website, from press releases, news items (that reflect the public image of the idea and the company), nine academic papers on the particular idea published in high ranking natural science journals from 2010 until 2018 (which reflect the scientific aspect of the idea journey), and six patents from the German patent register (www.depatistnet.dpma.de), information on the status of the clinical trials from the clinical trial register (clinicaltrials.gov), and information about the company from the German commercial register (handelsregister.de). I have replaced all names of individuals and organizations with pseudonyms. All information that may have provided hints as to the identity of persons and organizations or their particular products and idea have also been omitted or replaced to avoid the identification of the organizations and persons involved.

As ideas have to be addressed as 'complex socio-cognitive processes' (Cohendet and Simon, 2015, p. 5) and as 'creativity is not merely the outcome of a set of independent variables, but rather evolves over time through a range of interdependent actions' (Fortwengel et al., 2017), the aim of this study was to consider the idea journey in its entirety as much as possible. This means being alert to the social factors and events that drive success or failure in each phase, the tensions between intended and serendipitous iterations, the formal and informal processes, the moments of validation and contestation, as well as the tensions and paradoxes that shape the innovation processes as embedded in a social network (cf. Perry-Smith and Mannucci, 2017; Cohendet and Simon 2015; Garud et al., 2013). Given the approach to secrecy as a fundamental category of social relations (Simmel, 1906) and hence generative of and in organizational and creative processes (Costas and Grey, 2016; Courpasson and Younes, 2018), secrecy is a lens to understand the social process of the idea journey (cf. Keane, 2008). In other words, by putting secrecy into the foreground, it allows us to see and locate the constitutive processes of creativity. I began inductively by exploring the creative process, to see which forms of secrecy emerged throughout the idea journey (rather than taking the secret or working in secret as a starting point). This means that in my interviews, I asked about key actors, milestones and obstacles, followed by direct and indirect questions that touched upon the processes of knowledge sharing, protection, confidentiality and trust. This narrative approach to the informants' personal experiences of past and ongoing events allowed me to distil those events and secrecy practices that shape the idea process and identify moments where the process 'culminate[s] in creative moments' (Fortwengel et al., 2017). Based on this, I developed a narrative of the idea journey and identified key moments that particularly shaped the creation, maturation and development of the idea, and their respective elements of confidentiality and secrecy.

The case: A new idea based on a previous success story

We started with humans, (...), as opposed to big pharma, that starts with cells. (p-15.05.18iFS)

BedroPharm is a small biopharmaceutical start-up company with the mission to improve the mortality rate of a particular globally widespread condition for which there is currently no cure. "X" is one of the deadliest conditions worldwide and extremely costly, as patients require extended treatment in intensive care – the most expensive of all hospital treatments. *BedroPharm* focuses on research and development of an anti-body based therapy to positively influence a peptide, which we will call "A" in the remainder of this paper. The innovative idea of *BedroPharm* is based on the researchers finding that "A" is responsible for "X" and therefore a potential drug target. Based on this discovery, *BedroPharm* has developed an anti-body to treat "X". Pre-clinical trials in mice and other animals conducted by the company over the past 10 years have shown that injecting the antibody significantly reduces the mortality rate of mice with condition "X" and is harmless for humans. The company recently received the green light and funding to test the antibody on humans (clinical phase 2). This advanced stage of the

pharmaceutical development process makes *BedroPharm* an attractive candidate for big pharma companies and other investors. At the time of research, the company therefore finds itself in a highly tense and exciting phase of ‘waiting’ for the results, ensuring that the trials are conducted properly and ‘keeping one’s fingers crossed’ (e.g. p-15.05.18iFS).

Findings: Idea trajectory in relation to (in)formal secrecies

The promising antibody that is currently being tested in clinical trials is the outcome of an idea that has changed its trajectory many times. The following section narrates the idea journey of the development of this antibody by pointing out which modes of (in)formal secrecies played a crucial role at various moments.

Idea spark: Norms-based secrecy

The idea spark can be traced back to the moment of identifying “A” as the substance that appears to play a crucial role in causing “X” during a ‘sparring meeting’ with an external colleague in the late 2000s, while the company founders were still working in senior management and CEO positions at their previous company *CohnsLab* (p-15.05.18iFS). John, who was Chief Research Officer at this company, had invited a “very experienced elderly scientist” (ibid.) who worked at a reputable research institute in the U.S. At this small meeting, John and his colleagues showed the American scientist a PowerPoint presentation of their latest results of blood tests from patients who had been critically ill with “X”. This included, amongst others, an irregularity in the data, which they had not been able to explain. A former *CohnsLab* and current *BedroPharm* employee recounts the senior scientist’s reaction upon learning about the irregularity as followed.

‘Man, you have to start a company with this. It’s crystal clear, this substance that dilates the vessels. It’s as clear as eggs is eggs, you have to make a therapy with it, you just create an anti-body against this substance, you inject it into the blood stream, it binds itself to “A” and blocks its efficacy. Then you have “X” under control and done!’ (...) that really was the trigger [for our idea](p-15.05.18iFS)

This data – comparing critically ill patients with healthy patients – demonstrated that the former group showed an increased incidence of the peptide “A”, which subsequently modified the patients’ vessel structure. This caused further negative effects leading to “X”, a life-threatening condition. In the participants’ narrative, this meeting is considered as the ‘breakthrough moment’ of the discovery, the moment that their history begins. It is accredited to the experience and combinatory logic of someone who was ‘outside of our inner circle’ (p-15.05.18iFS, p-24.04.18iFE), and saw something to which neither the group nor the literature had paid any attention. The ‘idea spark’ occurring at the meeting was, however, not coincidental.

It was always a particular approach of our chief research officer to talk as much as possible with other people and also to partly tell them ‘things’. Well, you always made some formal confidentiality agreements, but you never sue, that is all nonsense. Also, because you don’t really know what this may be good for, you just ‘throw something into the ring’. (...) Then someone else has a thought about it, and that was always John’s strategy, to proceed like this, the exchange, to invite people and exhibit your data (...) in the end, it increases the value of the company, because then people talk more about the company, and investors will ask, ‘do you know XX?’ (p-15.05.18iFS)

John’s intention to share internal information with an external colleague during an informal meeting had a clear purpose: inspiration and recognition. It allowed for a moment of collective ‘cognitive flexibility’ (Perry-Smith and Mannucci, 2017) based on bringing together experience from two divergent fields – diagnostics and therapeutics, each represented by the internal group

and the external expert. The exclusivity and confidentiality between selected and trusted individuals generated new ideas based on this information. In other words, the openness at the closed meeting enabled a ‘creative moment’ of convergence (Bilton, 2007; Kupferberg, 2006, 92). This meeting therefore shows how the tension between openness to share and closeness to protect can create an atmosphere of trust which enables the idea spark (in addition to protecting potentially valuable information). Here, the nature and value of the confidential information that is to be protected changes during the course of the meeting. This means that the *outcome of a secrecy process* is based on the productive tension created in the interplay of concealment and revelation in a small circle of entrusted individuals.

This required two interrelated forms of trust to play a role that enabled the confidentiality of the meeting and facilitated cooperation amongst individuals in this informal network (Schrader, 1991). The external scientist, the recipient of potentially valuable information, was qualified as trustworthy because of his academic reputation in the field and his broad network (p-24.04.18iFE). Thus, both the social norm of academic knowledge sharing (Merton in Oliver, 2009) as well as a perceived absence of competition amongst the scientists played an important role. This was perpetuated by the external scientist’s generosity to return the ball and share his idea (p-15.05.18iFS, p-24.04.18iFE, cf. Di Stefano et al., 2014, 1645f). Thus, norm-based trust played a crucial role in creating an environment for convergence, which, on the one hand, sparked the creative idea, and, on the other hand, legitimized the idea as valuable (cf. Oliver, 2009, p. 174). As the quote shows, this informal form of secrecy based on trust was more important than promises of formalized confidentiality agreements. As the idea generated at the meeting had not yet been transformed into tangible or codified knowledge, the scientists relied on this informal practice.

Idea maturation: Interpersonal trust-based secrecy

Shortly after this meeting, *CohnsLab* was sold to an American company, which bestowed the founders with large profits. Restricted by a non-compete clause, two of the founders – who had been present at the above described meeting – asked a former *CohnsLab* colleague and protégé (who now owned a spin-off) to register the new company *BedroPharm* in their name (p-13.06.18iFM). After the work ban terminated, the two founders took over the company from him and immediately invested their private revenues into *BedroPharm*. During this initial period after the sale, the two founders informed only two other former colleagues of their new venture. These were colleagues, with whom they had worked closely for many years and whom one of the two founders had known since his student days nearly two decades ago. This small group of colleagues and friends started exploring the idea further by scanning the patent situation. For this period, it is not exactly traceable when and who carried out this work, as some of the group members were still working at *CohnsLab*, yet the group supported each other with ideas and expertise. It is important to point out that there was no formal conflict of interest, as *CohnsLab*’s successor was active in a different field and different market. Nevertheless, the scientists “*did not shout [about the company founding] from the rooftops*” (p-15.05.18iFS). As one researcher recounts: “*It was not in direct competition to our former company, but still you can... if you want to construe something... we did not want to risk it*” (p-15.05.18iFS).

In situations in which creative ideas are still emergent and fuzzy and ownership has not yet been formalized in forms of patents, the risk of idea appropriation is particularly prevalent. Hence, the scientists had to rely on informal mechanisms of knowledge protection. This example resonates with other recent literature that informal ‘skunk works’ or ‘going underground’ is common and crucial for the development of new ideas (Kupferberg, 2006; Courpasson and Younes, 2018; Criscuolo et al., 2014; Malik et al., 2018). In this case, the parallel work of the scientists enabled by the friendly good turns of former colleagues was necessary to keep the idea alive. What we find here is that different modes of secretcies come together in order to maintain the ‘creative collaboration’ (Ibert et al., 2018) by flexibly interpreting formal employment regulations until the right working conditions are established.

Not publicizing their idea also had another effect. The following narrative shows that being secretive about their idea also helped them to cope with the uncertainty of elaborating on this embryonic idea.

It was absolutely beneficial to the further development of the idea that we worked in a small group with great trust in each other. Especially in this phase, when it was unclear which direction the idea would take. (...) we could talk openly about results and observations in our close circle of confidants, it mutually stimulated us to evaluate and interpret [the idea] and also to question it, which helped us to enter a new path. This kind of 'sparring', this works efficiently, especially when the participants have a strong trust relation. It is about not exposing or compromising one another. (p-15.05.18iFS)

The confidentiality pertaining to the first two years of idea development created a 'safe space' for the small group to discuss, discard and develop further aspects of their idea. The mutual understanding of working covertly mitigated the risk that the idea would be killed too early. It created a degree of freedom to ask difficult questions, challenge each other, experiment widely and keep negative feedback at bay (Dufresne and Offstein, 2008, p. 103). In other words, the mutual trust amongst the group created a parallel world (Simmel, 1906, p. 462), or a 'fortress' (Bangle in Perry-Smith and Mannucci, 2017) that was necessary to further develop the idea, and increased the motivation of the entrusted individuals to work harder and get excited about the project (cf. Dufresne and Offstein, 2008; Courpasson and Younes, 2018).

Idea development: Law-based secrecy

Once the company was founded and the two group members officially joined the company for research and public relations, the now formalized group conducted about 30 series of animal trials to develop the anti-body. Here, the above-mentioned colleague, who was the official first founder of the company, played yet another crucial role. His company ran the first experiments, first free of charge, and later as an official contractor. As a contractor, he usually receives 'blinded substances' from his clients to produce cell-lines and anti-bodies, but in this case, he was let in on the idea, which gave him more flexibility 'to test in different directions' (p-13.06.18iFM). (However, as a standard procedure to avoid personal bias, the substances were still blinded during the trials). With relatively little knowledge as to what could be a promising anti-body, he and his team just 'tried everything' (p-15.05.18iFS), which *BedroPharm's* lead scientist described as a "rather technical phase with little innovative potential", as it meant fulfilling a number of required tests on toxicological models and animals to find the adequate substance that they could later use on humans. This process of idea maturation through experimentation and testing had the purpose of building up a patent position that made the company incrementally more attractive for investors, as well as building an academic reputation in the field through publication in highly renowned peer reviewed journals to make the company and their efforts more credible and public within the respective community. Lastly, the trials were, of course, the necessary step to comply with the regulatory terms necessary to start testing on humans (p-15.05.18iFS).

Beyond this small core group of six men, who all knew and had supported each other in one way or another since their student days or working at *CohnsLab*, the group was linked to a larger network of service firms and academics that conducted more trials and experiments on their behalf. Contrary to the trust-based informal secrecy of the core group of initiated scientists, these business and academic relationships were organized by formal processes of secrecy, including codes of conduct and confidentiality agreements, and yet using blinded substances. In sum, this phase of idea maturation included both informal sharing of information beyond the standard procedures as well as relying on formal secrecy mechanisms.

Idea validation: Negotiated secrecy

Four years after *BedroPharm* was founded, the head of R&D received an email from the testing company on the mice trials that they had conducted. Two groups of mice had been made ill artificially with condition “X” and one of the groups was treated with the anti-body. The results showed a lower mortality in one of the groups. The head of R&D recalls the moment of revelation, i.e. when he ‘de-blinded’ the groups to see which group of mice had actually died, as an elevating experience. “As a scientist”, he continues “you don’t get to experience this moment more than 5-6 times throughout your professional career”, “it is not very often that it really goes ‘bingo’” (p-15.05.18iFS).

However, this moment of idea validation entirely changed the strategy of the company from relative confidentiality to as much publicity as possible in both the academic and business communities. As one of the owners recounts “Until the first patent, everything is extremely confidential within the in-group. After the first patent, as a start-up company, what you want is publicity” (p-24.04.18iFE). After the idea had been validated in the mice experiment, the colleagues started strategizing as to how to reveal the results to the academic community as well as to investors. Given that the patent situation is the most valuable asset for a start-up company, they withheld the results from their academic partners until the patent was filed. How, when and to whom to reveal the results vis-à-vis the academic partners and academic community had to be carefully calibrated, as their academic reputation was at stake.

This is because as an academic, which I still am, the academics are always suspicious about the company that it is a commercial bum, who wants to make money with just some kind of [stuff]. As a company, it is important to create a reputation as academically competent and on the same level as your academic partners. This is important, as it allows you to have an open conversation with your partners, which can lead to further cooperations, an interest that we nurture as a corporation because it helps us to further develop the idea. (p-15.05.18iFS)

While this first phase of research took place in relative isolation to protect their idea, the firm now needed to find a way to be open about their endeavor in order to entice the interest of investors. The firm had to negotiate carefully with their academic partners on how to present the findings in a way that showed the glass as ‘half full’ rather than ‘half empty’ (p-15.05.18iFS). In other words, lengthy negotiation processes had to take place with the academic partners about which parts of the secret to disclose and conceal in order to stay true to the facts, but also to create attractive signaling effects for potential investors (cf. Ndofor and Levitas, 2004).

Idea development and championing: Attuning facts and narrative

Shortly after revealing their first idea to the public, the scientists were confronted with competing results from another research group studying the same peptide “A”. This group showed radically different conclusions as to “A’s” effectiveness in relation to “X”. These findings had a confusing effect on the *BedroPharm* scientists, as it challenged them reject or at least radically question their original idea, something that they were not ready to do given their financial, operative and emotional investment in this idea. The head of R&D recounts that for a period of time they tried to ‘ignore’ these findings, or tried to beat the other group by telling themselves that what they have is better, more reliable. “We were confident that our idea was the right one and we pushed some of their results aside” (p-15.05.18iFS). With time, however, it became evident that they could no longer snub these findings, as their own experimental results also gradually contested their original theory. Additionally, and given that their idea was now ‘out in the open’, outside experts from the field increasingly questioned how their endeavor related to the results of the other group. “They increasingly asked us ‘you say A is bad, and they say A is good, how does this fit together?’” (p-15.05.18iFS). At some point, they admitted that

their original theory was no longer viable. *“It just did not fit together... the original idea was no longer true... but ... it still worked anyhow”* (p-15.05.18iFS)

While they had originally focused on the fact that “A” dilates the blood vessels being a cause of “X” occurring, the other group found that “A” solidifies the vessels, a condition that can alleviate “X”. Facing the results that they had kept ‘hidden from themselves’ eventually became a booster for their own idea. They added further experiments that found that “A” had different effects depending on whether it was located in the blood or in the tissue. Based on these observations, they adjusted the original explanatory model by modifying the story about how the antibody would have an effect on “A”. Instead of blocking “A”, they concluded that the antibody had the capacity to bind “A” and therefore increase its positive effect of solidifying the vessels and decreasing mortality. This changed interpretation, occurring six years after the original idea spark, of how the antibody functions (binding instead of blocking) is what the relevant scientists in the field now consider the truly “innovative potential” (as stated in the relevant publications) or “geniality of the idea” (as stated by an employee, who joined the company later) (p-13.06.18iFS). As this is a condition that coincides with many other illnesses, the new insight broadened the treatment spectrum beyond “X”. Thus, the idea as such radically changed from an antibody that can cure “X” to an antibody that demonstrates a radically new form of efficacy that could be used for many different illnesses. The idea funnel, so to speak, was widened again to a myriad of new possibilities. In other words, this form of deliberate group ignorance (Dufresne and Offstein, 2008) created a closure among those involved and was beneficial to the realization of the idea, as they reduced their level of perceived uncertainty and continued the normative pressure to work collaboratively towards a common goal. The effect was eventually to open up the idea spectrum again.

Idea simplification and championing: narrative secrecy

The ‘tilted story’, as the scientists themselves call this new development, had another positive effect. Over the years, it had become more and more apparent that finding a treatment for “X” is a “pie in the sky”, an endeavor on which many other scientists and companies had already burned their fingers (p-24.04.18iFE). The field of finding a treatment for “X” had *“suffered from a huge array of phase II failures”*, so *“most players in the sector link [“X”] to failure”*. This made it more difficult for the company owners to convince investors of the viability of their idea. Given the new potentials of the antibody, however, relevant investors *“were more thrilled by the results in another medically underserved area”* (p-18.06.18aCS).

Investors and big pharma, they always need a story, they need an explanation of why it can work, this also has an emotional component, results alone are not always convincing if you cannot plausibly argue what is really happening there. (p-15.05.18iFS)

The changed story allowed the group to position themselves in new treatment areas that were more attractive for investors. At the same time, their ongoing clinical trials still treat patients with “X” with the antibody – a path-dependent decision. With the information the scientists have now, they know that they would have been more successful trying the anti-body on a different condition (p-13.06.18iFS). This shows that there are different degrees of sharing or withholding information from potential investors relating to different phases of communication. At the same time, attuning the story requires presentation of the various risks and uncertainties in a piecemeal fashion, so that risks can be mitigated.

To brush the risk under the carpet does not work, it may work in the first and second talks with investors, but once we get the specialists they turn over every stone. (p-15.05.18iFS)

Drug efficacy is only one of many uncertainties. Further areas of concern are how ‘water-tight’ the patent situation has been built up, whether the actual substance is available in sufficient amounts, whether the cell line is ‘alright’ (*“did it go idle through some kind of virus?”*), the drug

regulation situation, whether enough patients can be recruited for the trials, and so on. It is a puzzle of uncertainties, some more tangible than others, but each single one can threaten the idea and has to be contained vis-à-vis the investors. In other words, the idea that constitutes the secret is not clear-cut, it changes throughout the idea journey, also due to the various (strategic) forms of how the story is structured, framed and narrated, as well as which aspects are emphasized or completely concealed (cf. Sapir and Oliver, 2017, p. 35). Just as any idea is not viable without finding the right alliances to support and further develop it (Perry-Smith and Mannucci, 2017), the scientific discovery alone and the ‘data’ and ‘patents’ as evidence of the invention are not sufficient to successfully commercialize the idea. How to tell the story to incite successful commercialization of the discovery of “A” and the promising potential of the antibody to treat “X” is, thus, an important part of the daily management of *BedroPharm* AG.

Table1: Modes of (in)formal secrecies pertaining to the idea journey

Mode of secrecy	Intention	Boundary	Forms of implementation	Effect on idea trajectory
Norms-based secrecy (informal)	Academic knowledge sharing, convergence (inspiration, reputation)	Scientists vis-à-vis rest of the company	E.g. closed meeting to share and discuss confidential data	Idea spark
Interpersonal trust-based (informal)	Circumventing formal rules to operationalise the idea, predictability through reliance on known expertise	Scientist-entrepreneurs vis-à-vis (former) employer	E.g. working covertly	Idea maturation
Law-based (formal)	Avoid idea theft, protect and generate commercial value of company,	Company vis-à-vis partner firms	E.g. NDAs	Idea validation, championing
‘Physical’ (formal)	Avoid bias and vested interest	Company vis-à-vis partner firms, scientists vis-à-vis self	e.g. ‘blinded substance’	Idea testing and development
Exchange-based secrecy (informal)	Publication, creating a ‘signaling effect’, increase reputation in academic community and commercial value in business community	Scientist entrepreneurs and academics vis-à-vis academic community	e.g. Negotiations and calibration with academic partners on how to present results	Idea-questioning and re-interpretation
Self-enforced group ignorance (informal)	Protect idea from being refuted (eventually inducing)	Vis-à-vis self and colleagues	e.g. Consciously ignoring contradictory results from competitors until new interpretation has been achieved	Simplification and championing
Narrative secrecy (informal)	‘Impression management’ to increase commercial value of idea (making the idea convincing, understandable and attractive)	Scientific entrepreneurs vis á vis investors and general public	e.g. Consciously ignoring contradictory results from competitors until new interpretation has been achieved	Idea championing

Discussion and conclusion: The generative capacities of secrecy

This paper intended to illuminate the dynamic and generative role of (in)formal secretcies in idea generation processes. Moving beyond functionalist approaches, this paper focused on the social dynamics of the relationship between secrecy and creativity. In this case study, secrecy was not only effective in order to prevent some loss of a pre-defined, already existing valuable idea as the property of *an* organization or *a* group of individuals. Instead, we found secrecy generative in various overlapping and intersecting modes that affected the idea trajectory as well as its valuation. The remainder of this paper elaborates on how these findings may feed into existing discussions on idea trajectories, trust/social control and valuation.

Exploiting the tension between concealment and revelation

As Simmel (1906) pointed out, secrecy should be a fundamental category in the analysis of social relations. Practices of secrecy are constitutive of social relations, organizations and consequently also of creative processes (cf. [Costas and Grey, 2016](#); [Courpasson and Younes, 2018](#)). Based on these assumptions, this paper mobilized the concept of secrecy as a lens to understand the social processes of an idea journey (cf. [Keane, 2008](#)). Contrary to considering secrecy as an exceptional or deviant practice that evokes and catalyzes creative processes by enhancing employee motivation or divergent thinking ([Courpasson and Younes, 2018](#); [Malik et al., 2018](#); [Criscuolo et al., 2014](#); [Mainemelis, 2010](#)), this case study drew out instances of secretcies as mundane practices that are part and parcel of the working life of R&D scientists. Following the idea journey in its 'entirety', that is, along different moments and phases (e.g. ideation, maturation, championing, implementation) ([Cohendet and Simon, 2015](#); [Perry-Smith and Mannucci, 2017](#)), these instances of secrecy do more than protecting the idea. They can shape, support and challenge the development of the idea in productive ways. In this sense, the case underlines recent studies in management and organization that show that secrecy is not inevitably the necessary evil of innovation processes (i.e. quelling the free flow of knowledge) ([Courpasson and Younes, 2018](#); [Mainemelis, 2010](#); [Malik et al., 2018](#)).

This productive aspect of secrecy as a social practice has already been noted by Simmel, who states that

secrecy involves a tension, which, at the moment of revelation, finds its release. This constitutes the climax in the development of the secret; in it the whole charm of secrecy concentrates and rises to its highest pitch (Simmel, 1906, 465).

The creative tension that Simmel describes derives from the fact that willfully concealing information is always imbued with the intention or the threat that information will be revealed at some point. In the case of the meeting that generated the idea spark, we can argue that the meeting's initiator strategically exploited this tension. The 'whole charm of secrecy' was felt by the small, selected and entrusted group that participated in the closed meeting. The confidentiality of the meeting allowed for a free exchange of ideas between scientists from divergent fields, and it was the moment of sharing their confidential blood test results ('*an irregularity in the data*') that culminated in the idea spark ('*it is as clear as eggs is eggs*'). Thus, secrecy is a reciprocal practice that revolves around carefully navigating which information to share or withhold, when, and amongst whom (Simmel, 1906, p. 465). While drawing on the scientific norm of open knowledge exchange, it was the confidential and trustworthy aura of the meeting that triggered the generous comment by the external expert later identified as the 'breakthrough moment'. This adds to current literature indicating that covert activities enhance the cohesion and social bonds amongst scientists and therefore create an 'intensive' atmosphere that can catalyze creativity ([Courpasson and Younes, 2018](#)). In this sense, the closed meeting can be considered as a strategic management decision to induce creativity. It shows that creativity as an outcome of the intensity generated by the 'exceptional status' of the covert activity is not restricted to the 'grey area' of subverting, ignoring or circumventing managerial orders. The intensity can also be generated in the mundane scientific norm of confidential

knowledge exchange. The confidential status of the specific situation of the mundane meeting nevertheless created a sense of the exceptional, which momentarily annulled “competitive interests” (Simmel, 1906, p. 492).

Ignorance as self-imposed constraint

Adding further to current literature on creativity in innovation processes, this case provides some inspiration to think of secrecy as a self-imposed constraint to reduce uncertainty in order to anticipate creativity. As extant literature has pointed out, imposing constraints or ‘making things difficult’, such as deadlines or limited financial resources, are an important driver of creativity (Bicen and Johnson, 2015; Ortmann and Sydow, 2018). The scientists mobilized an informal modality of secrecy that can be considered as self-enforced group ignorance. By temporarily ignoring and moderating the results of a competing scientific group that radically challenged the soundness of their idea, the scientists created a temporary closure amongst themselves. This was necessary to reduce their level of perceived uncertainty about the validity of the efficacy of the anti-body. Moreover, ignoring the competing results became a necessary tool to maintain the motivation and reduce the anxiety of having to forfeit an idea in which they had invested years of work, large amounts of their private capital, and lots of hope. Rather than knowledge hiding, we find a situation in which ‘knowing what not to know’ becomes an important form of knowledge (Taussig, 1999). McGoey and other recent sociological research on ‘strategic ignorance’ suggest that This example shows how the practice of withholding information is conducted openly, a ‘public secret’ as a necessary constraint to avoid an early ending of the idea trajectory. The successful management of non-knowledge at this organizational level helped the group to function more efficiently by dismissing the unsettling knowledge in the form of simply not discussing or devaluing it. Thus, self-enforced group ignorance as a constraint is a form of informal secrecy that becomes a key asset to ensure certain freedoms for the process of incremental innovation and is firmly integrated into the daily practices of the scientists’ work.

Overlapping secrecies

Following the idea journey beyond the ideation process also revealed that secrecy is neither a one-time decision nor a static process. Just as the innovation cannot be characterized as a straight-forward process that begins with the idea spark and ends with a successful market entry (Cohendet and Simon, 2015; Garud et al., 2013), secrecy cannot be limited to the one-time and rational decision for a particular protection mechanism. The case study revealed that the idea journey is shaped and molded by overlapping and intersecting modes of secrecies.

This includes the simultaneous use of different protection strategies as well as the combination of formal protection mechanisms and informal concealing practices. For example, after the mice trials had validated *BedroPharm's* idea, the company could secure the idea with a patent. However, this set in motion a process of careful negotiation with academic partners about which parts of the results to publish in the academic journals, without revealing too much about the risks involved so as not to quench investors. Thus, again, concealing and revealing is not a one-time event, but rather requires constant decision-making and negotiation with the scientists’ academic partners. Moreover, the case also showed that mobilization of and reliance on the ‘old boys’ network’ rather than formal modes of secrecy trumped the latter. These insights allow us to think of the role of secrecy in innovation processes not as a gradual process. Formal and informal secrecies overlap and intersect as the idea continues to be modified, based on new internal and external insights. Thus, we can perceive of secrecy along the idea trajectory as a ‘set of movements’ of various overlapping, formal and informal, strategic and incidental, clear and ambiguous modes of secrecy. Secrecy is a dynamic (Bos et al., 2015) and collective process (Courpasson and Younes, 2018) that is sometimes just as unpredictable as the idea journey itself.

Secrecy as a valuation apparatus

Lastly, this case opens new questions in regard to understanding secrecy as a valuation apparatus (Orlikowski and Scott, 2014), i.e. secrecy as a process to not only constitute the idea as such but also its valuations. The knowledge appropriation approaches conceive of secrecy as a protection mechanism or as a practice to further develop an already existing idea. In this approach, value is understood as an intrinsic property of the idea or its innovative potential. If we think of secrecy through the lens of practice-based approaches that understand the act of valuing as constituted through everyday practices (Kornberger, 2017; Orlikowski and Scott, 2014) or as “a quality that has to be performed” (Hutter and Stark, 2015, p. 2), the static conception of secrecy as a protection mechanism of an existing value changes. It raises questions as to how secrecy as a practice not only captures but also creates value.

For example, we have shown that the meeting that generated the idea spark used the tension between openness to share and closeness to protect. This created an atmosphere of trust that enabled the idea spark. The *secret* here was *only the outcome of the secrecy process*. By decoupling value from secrecy, Simmel shows how value can be an actual or perceived effect of secrecy (Costas and Grey, 2016: 27). Simmel (1906) states that secrecy as a practice has more qualities than the assumed means of protection. He states that secrecy contains “the charms and the values which it [secrecy] possesses over and above its significance as means” (Simmel 1906, p. 464). He describes secrecy as a practice of group formation and creating boundaries between the knower and the ignorant and how it has powerful effects on the perceived worth of the group, such as a sense of specialness amongst the group insiders (e.g. an elite formation of the group). This has an effect on the valuation of the group and consequently may motivate insiders to work harder, become more committed or loyal in regard to working on the idea because of the elevated position resulting from the exceptional status of secrecy (Costas and Grey, 2016, p. 26; Courpasson and Younes, 2018). This valuation effect can also be extended towards the valuation of the idea as such. Knowing of the existence of a secret, but not necessarily the content of the secret creates an aura of mystery that can “elicit awe” (Luhmann, 1989, p. 138), which can become an affective judgment device to confer value. For example, a key value for *BedroPharm*, as cited in most of the interviews, is the strong patent position, which secures the antibody from idea theft. The patent as such becomes a judgment device to confer value on the idea, even though what the patent as such guarantees remains uncertain to many of the stakeholders due to the complexity of the knowledge field. The insistence on the ‘strong patent situation’ of the company shows that “there is nothing intrinsic to the content of the transmitted information that necessarily constitutes it as a secret, until it is labelled as such by the teller” (Rodriguez et al., 1992, p. 301). Patenting is a form of ‘secret telling’ that is infused with social meanings and interactional implications, such as attracting investors or new employees. Patenting creates a ‘fence around the field’ that then allows them to further develop the idea, but keep competitors at bay.

A second device for valuation is creating a narrative on the efficacy of the antibody. Here, secrecy becomes an important part of impression management and image construction (Phillips et al., 2009, p. 711). The strategic exploitation of the tension of concealment and revealing features a secret in order to signal the company’s innovative capacity. This, however, implies careful management and steady adjustment of the narrative (Sapir and Oliver, 2017). For example, in this case, the narrative has changed from treating “X” as major promise to highlighting the innovative efficacy of the anti-body for several causes. The ‘tilted story’ involves the careful disclosure of positive information around the framing of drug efficacy and reduced mortality, while withholding other information on other uncertainties (such as the ‘water-tightness’ of the patent situation, the availability of the actual substance for trials, the drug regulation situation, whether enough patients can be recruited for the trials). Thus, narrating the story of the antibody is a double act of highlighting and hiding (Kornberger, 2018, p. 1760). The common dimension of ‘mortality’ is “all that counts in the end”. In other words, the focus on reduced mortality ‘flattens’ the many risks, it transforms the messy, heterogeneous process into a neat order that is conducive for investors. It is a way of conveying information to

diminish the salience of other risks. Here secrecy “sets in motion a process – of interpretation, ambiguity, and the quest for hierarchy” (Piot, 1993, p. 362).

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Otto (2018), The generative properties of secrecy in idea development

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Organized Creativity - Practices for Inducing and Coping with Uncertainty

The aim of this DFG-sponsored Research Unit (FOR 2161) is to examine different dimensions of uncertainty in several practice areas and investigate what role they play in creative processes in different contexts and over time. Therefore four different projects will be conducted, in which the dynamics in both the music and pharma industries will be compared. The focus of all these projects will thereby be the creative process both in organizations and in interorganizational networks.

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Organized Creativity Discussion Paper

