Master Thesis

MSc Business Administration – Entrepreneurship, Innovation & Strategy

# A MIXED METHODS APPROACH TO INDIVIDUAL RESILIENCE AND INNOVATIVE WORK BEHAVIOR IN ADVERSITY

Lena Hülscher

GRADUATION COMMITTEE

Prof. Dr. Ir. Petra C. De Weerd-Nederhof

Drs. Ing. J.C. Koen Kuijpers

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UNIVERSITY OF TWENTE.

**Abstract**

The paper analyzes the relationship between individual resilience and innovative work behavior (IWB) while exposed to adversity. The main part of the study takes place in the context of a Dutch social company that faces a possible dismantling and drawback of governmental support for their work. In the context of this study, we refer to the potential dismantling for the social company as adversity. Based on three systematic literature reviews, we assume that individual resilience does not change when comparing pre- and post-adversity levels ($H_1$), whereas innovative work behavior (IWB) does change while exposed to adversity ($H_2$). Additionally, we hypothesize that IWB and resilience are connected and aim to find out how the two concepts are related while exposed to adversity ($H_3$). The study follows a mixed-methods approach: Study 1 consists of a quantitative analysis of panel data of 78 participants/staff members in the Dutch social company, which robustness is checked by the data of Dutch employees. Study 2 strengthens the quantitative analysis by 6 semi-structured interviews including a timeline mapping method and follow-up questions with the respondents 6 months after the initial interview. Quantitative results show no significant difference between the levels of individual resilience and IWB comparing pre- and post-adversity. A linear mixed effects model with supplementary analysis examines that there is a relationship between the concepts, but the adversity does not play a significant role in determining the levels when comparing pre- and post-adversity measurements. Our qualitative results support these results with underlying reasons and additional perspectives, for example the company's culture, characteristics of the employees or the state of the decision, adding to existing literature with regards to the individuality of the concepts. The unique research design with its contextual effect of adversity fills the gap of empirical studies in the field of resilience and innovation and also helps managers to understand what can be done to support employees in times of adversity.

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# 1. Introduction

As the context of business is increasingly volatile, the flexibility to react to unexpected challenges and adversities becomes more important (Näswall, Kuntz, & Malinen, 2015). Resilience emerged in research as an answer to the environment's complexity, building a strategically important capacity for organizational success (Bardoel, Pettit, De Cieri, & McMillan, 2014; King, Newman, & Luthans, 2015) and influencing the strength of organizational systems and employees' performance levels (Näswall, Malinen, Kuntz, & Hodliffe, 2019). Further, the especially challenging situations in the context of adversity require resilient capabilities, whether on the level of individuals, teams, or organizations (King et al., 2015).

In the individual context, resilience can be defined as "positive adaptation within the context of significant adversity" (Luthar, Cicchetti, & Becker, 2000, p. 543) and describes the ability of individuals to recover from challenging situations (Moenkemeyer, Hoegl, & Weiss, 2012). This does not exclusively emphasize the sole recovery, but also includes the learning for more challenging situations (Moenkemeyer, 2011). Individual resilience can further be viewed as a dynamic process or state facilitated by disruption and rehabilitation instead of only a fixed trait, embodying the conceptualization as a shapeable phenomenon that develops in the context of adversity (King et al., 2015).

As this context-specific conceptualization of individual resilience includes the recovery and learning capability, it could also influence innovative behavior in the light of the adversity. The connection between innovative work behavior and individual resilience can especially be seen in innovation projects including the development of new products and services. These are likely to be stopped before fulfillment and potential challenges need to be handled flexibly (Moenkemeyer et al., 2012). Although this is often natural to innovation processes and further challenging projects (Clegg, Viera Da Cunha, & Pina e Cunha, 2002), the potential impact on innovative work behavior can be immense (Välikangas, Hoegl, & Gibbert, 2009) and requires resilient capabilities (Moenkemeyer et al., 2012). Different authors even connect the two concepts of individual resilience and innovative work behavior, especially related to the context of innovation projects (Moenkemeyer, 2011; Moenkemeyer et al., 2012; Shoss, Jiang, & Probst, 2018). As challenging times require innovative approaches as well as resilient capabilities to deal with the problems, employees are forced out of their comfort zone and new situations arise, which are potentially a catalyst for new behavior (Brower, 2020).

Although theoretical contributions do exist, empirical research in the field of individual resilience has been limited so far (Näswall et al., 2019) and is lacking empirical evidence (King et al., 2015). Britt et al. (2016) specifically address the research gap of resilience in adverse work situations, further supported by King et al. (2015). In this regard, King et al. (2015) call for research that explores how adversity can influence resilience in the process of time. Additionally, van der Vegt et al. (2015) address how individuals behave in adverse situations and advise to study the longitudinal effects in experimental or in field settings, underlining the difficulty to introduce realistic crises and adverse situations.

The situational setting of individual resilience and innovative work behavior requires highlighting the type of adversity: What embodies the term adversity? Turbulence and discontinuities (Bhamra, Dani, & Burnard, 2011) or threatening and challenging situations (Meredith et al., 2011) are coining the term adversity. Moreover, "adversity can last a long time and encompass many events and changes in circumstances" (Coreprocess, 2019). In a blog article about adversity, de Bree distinguishes between three types of adversity: Adversities that affect oneself directly, adversities that affect the private life (i.e. people in one's private life) and adversities which have an impact on the professional life. The first type of adversity relates to circumstances like personal trauma, for example through health problems or toxic relationships, and is mostly malleable as actions can be taken to support the physical and mental health in most situations. The second type of adversity relates to people surrounding oneself and how their situations take an influence. For instance, divorce, losing a job, sickness or the personal trauma of other people can take its toll as well. As a third type, adversities concerning the professional life are mentioned: In his article, de Bree mentions mostly difficulties of young people, but this type of adversity also relates to problems surrounding the work environment.

The case study setting of this study optimally addresses the aforementioned research gap in the Dutch social company: As de Weerd-Nederhof, Kuijpers, Caniels, and Hatak (2019) state, sheltered workplaces require and base their performance on innovating, by means of the generation and sale of new services. Further, "it is likely that sheltered workplaces attract and value different individual characteristics of its employees, i.e. innovative work behavior" (p.10, de Weerd-Nederhof et al., 2019). Encouraging innovation and ensuring new services to continue to act as mediator between people with disabilities and work-providing organization is therefore vital and creates the ideal ground for researching resilience and innovative work behavior.

In the study, the adversity is taking the form of a potential dismantling. Since May 2019, the company is facing discussions about its future, as the six municipalities that support the joint arrangement proposed the dismantling. The final decision that still stands out can have a severe impact on personal and work life. This adversity for the individuals working at the company is likely to influence the state of resilience, innovative work behavior, and the relationship between the two concepts. Referring to the three types of adversity by de Bree as introduced earlier, the situation can be classified as professional adversity. Due to the state of the decision, the potential dismantling is first and foremast a professional adversity, with which the employees have to deal with during their job. Interestingly, as the decision moves forward, the adversity can also become more personal, depending on the employee's commitment towards the company.

The case company had already conducted surveys on employee well-being, including data on individual resilience and innovative work behavior in November 2018. As the data waves were continued, additional data about the variables after the adversity had been communicated became available, which brings the benefit of having realistic data in a field setting without artificially introducing treatments. Following a mixed-methods approach to get a diversity of perspectives as well as enhance the results, the quantitative design is supplemented by qualitative interviews.

This study aims to provide empirical research underpinning the relationship between individual resilience and innovative work behavior in light of adversity. Subsequently, the differences in individual resilience, as well as IWB before and after the adversity, are analyzed. Especially the unique research design, which resembles a survey without the participants as well as the researcher knowing about the adversity at the time of the survey, is valuable as a theoretical contribution. Taking the contextual effect of the adversity into account adds a new perspective on resilience research as well as its connection to innovative work behavior. Next to its theoretical contributions, the study is also practically relevant as it offers new perspectives on how adversities influence the behavior of employees. This can be taken up by managers to further support their employees, enhancing mental well-being and responsibility as increasingly important values for instance for HRM, but also overall company values and other disciplines.

The objective of this paper is to examine the relationship of individual resilience and IWB, while exposed to the possible dismantling. This follows the research question and the following hypotheses:

*RQ: How does the adversity impact the relationship between individual resilience and innovative work behavior?*

To answer the research question, we will investigate the difference of individual resilience pre- and post-adversity, the difference of IWB pre-and post-adversity as well as the relationship of individual resilience and IWB and how it is impacted by the adversity.

Subsequently, we introduce a working definition of the adversity in the case study. The theoretical constructs individual resilience and innovative work behavior will be explained, combined with a literature review on how the behavior potentially changes in light of adversity. We finalize our hypotheses with the focus on the relationship between individual resilience and IWB. After the mixed-methods approach is explained, the results are displayed separately before integrating both approaches and reaching a conclusion on the research question.

# 2. Conceptualization

## 2.1 Adversity

An adverse situation can take many forms: With 'challenging circumstances' as recurring part of many mentions of the concept, the range it takes is quite broad. Threatening and challenging situations (Meredith et al., 2011) or turbulence and discontinuities (Bhamra et al., 2011) can be mentioned as characteristics of adversity.

Examples include external challenges the COVID-19 crisis (Kuckertz, 2020), macroeconomic turbulence (Nyfoudi, Theodorakopoulos, Psychogios, & Dysvik, 2020), but also situations like personal trauma (de Weerd-Nederhof, Caniels, Hatak, & Kuijpers, 2018) or break-offs of projects in work-related contexts (Moenkemeyer, 2011). We earlier introduced the differentiation of the adversities as de Bree explained in his blog article and classified the possible dismantling as a professional adversity, with potential personal impact if the decision moves forward.

Since May 2019, the company is facing discussions about its future, as the six municipalities that support the joint arrangement proposed the dismantling. The consequences of the potential dismantling, which ongoing decision has still not reached a final solution one year after the initial communication, influence the lives of the most vulnerable people on the labour market

as well as the life and job of the current employees of the Dutch social company. In the following, we will use the term adversity to refer to the potential dismantling and form the working definition for the adversity as "the potential dismantling of the Dutch social company, where the decision and the future existence of the company are unclear at the time of the study."

## 2.2 Individual resilience

After first emerging in the 1970s in the research area of psychology, the concept of resilience has set foot in the organizational and business context around approximately 2000 (Moenkemeyer et al., 2012). The roots of resilience research lay in identifying risk factors leading to mentally dysfunctional individual and social characteristics as well as research focusing on surviving adversity (King et al., 2015). Despite several research directions in the field of genetic and neurological factors, individual protective factors like optimism, self-efficacy and self-esteem have mainly concentrated on psychological and clinical applications in contrast to the workplace (Van Hove, Herian, Harms, & Luthans, 2015). Nevertheless, resilience has taken foot in the research agendas as a recurring topic.

As explained, resilience has emerged in psychology, which makes the construct interdisciplinary and entails various definitions and explanations. Most authors reached common ground and describe it as the "ability to grow and move forward in the face of misfortune" (Jackson, Firtko, & Edenborough, 2007, p. 3) or very broadly as a factor that is affecting the individual's response to a challenging situation (Richardson, 2002), but ambiguous explanations try to grasp the underlying processes and reach only broad consensus.

Generally, two streams of research developed, dealing with resilience as different patterns of behavior. On the one hand, resilience is conceptualized as a trait, where resilience alters responses to day-to-day stress (Ong, Bergeman, Bisconti, & Wallace, 2006) and "individuals vary widely in their effectiveness of adaptation, in their ability to equilibrate and re-equilibrate in response to their ever-changing being and the ever-changing world" (Block & Kremen, 1996, p. 349). This approach uses the characteristics of human adaptability, like ego strength, emotional stability, coping, competence, self-efficacy, hardiness, and self-regulation (Block & Kremen, 1996; Tugade & Fredrickson, 2004).

On the other hand, resilience is treated from the process perspective as a state. Focusing on the malleability of the state, the concept can for example be defined as the "positive adaptation within the context of significant adversity" (Luthar et al., 2000, p. 543). This describes the ability of individuals to recover from challenging situations (Moenkemeyer et al., 2012) and

does not exclusively emphasize the sole recovery, but also includes the learning for further adverse situations (Moenkemeyer, 2011). Supporting this perspective is the growing research on cognitive transformation and personal growth training (Tebes, Irish, Vasquez, & Perkins, 2004) as well as psychological capital as antecedents and potential developing possibilities of resilience (Luthans, 2002; Luthans, Avey, Avolia, & Peterson, 2010). Additionally, this perspective is regarding individuals as both affected by and affecting their personality, behavior and the environment (Stajkovic & Luthans, 1998), meaning that "individual resilience can be seen […] as an antecedent of how a future setback affects an individual and […] as an outcome of a setback situation" (Moenkemeyer et al., 2012, p. 630).

Although the empirical research on individual resilience is in its first steps, some scales and measurement methods have been validated, which enables a further understanding of the underlying characteristics and meanings of resilience. They focus on different perspectives of the concept: Often, resilience is conceived as a trait, building a part of the individual's characteristics and therefore a relatively fixed personal concept which does not vary much if influenced by external situations (Caniels & Baaten, 2019; Luthans, 2002) . Another, relatively new perspective concentrates on a rather dynamic version of individual resilience. Authors following this conceptualization refer to resilience as a state and define it as varying with situations and over time (Britt et al., 2016; Kuntz, Näswall, & Malinen, 2016; Näswall et al., 2019).

We introduce the scales in this conceptualization of resilience, as we see the differentiation of resilience as a trait and resilience as a state in the conceptualizations of these. The items of the scale contribute to the understanding of the concepts and support the further process, in which the understanding of resilience is needed. The first scale displayed and later used in this article is by Smith et al. (2008) and focuses especially on resilience as a trait and on the measures to assess the concept instead of antecedents or personal coping styles. Ahern, Kiehl, Sole, and Byers (2006) identified this lack of measurement scales, grounding the 'Brief Resilience Scale'. The scale consists of six elements, which can be seen in table 1 and were tested on four separate samples. Although this scale was developed in the context of health research, it can also be used in business research.

*Table 1: The Brief Resilience Scale by Smith et al. (2008)*

| |
|---|
| I tend to bounce back quickly after hard times. |
| I have a hard time making it through stressful events. |
| It does not take me long to recover from a stressful event. |
| It is hard for me to snap back when something bad happens. |
| I usually come through difficult times with little trouble. |
| I tend to take a long time to get over setbacks in my life. |

The second validated scale was constructed by Näswall et al. (2015), further developed by (Näswall et al., 2019) and specifically focus on the individual resilience of employees. This scale is based on the conceptualization of resilience as a state, impacted by external situations and reflecting in dynamic behavior. The authors state that resilience can be observed through the behavior regarding work challenges, from adverse, extensive crises to day-to-day needs related to flexibility and complexity (Kuntz et al., 2016; Lengnick-Hall, Beck, & Lengnick-Hall, 2011)**.** Included in the scales is behavior that is associated with resilient employees – adaptive behavior, resource utilization, and development (Vera, Rodriguez-Sanchez, & Salanova, 2017)**.** Within three studies, the authors developed, initially tested and validated the scale, forming 9 items as can be seen in table 2.

*Table 2: The Employee Resilience Scale by Näswall et al. (2015, 2019)*

| |
|---|
| I effectively collaborate with others to handle challenges at work. |
| I successfully manage a high workload for long periods. |
| I resolve crises competently at work. |
| I learn from mistakes and improve the way I do my job. |
| I re-evaluate my performance and continually improve the way I do my work. |
| I effectively respond to feedback, even criticism. |
| I seek assistance at work when I need specific resources. |
| I approach managers when I need their support. |
| I use change at work as an opportunity for growth. |

For further proceedings, we will mostly use the Employee Resilience Scale by Näswall et al. (2015, 2019), as our research focuses how individual resilience might change in light of an adverse situation. Additionally, the scale focuses specifically on employee resilience, which fits to the case study setting in the sheltered workplace and the professional adversity.

## 2.3 Individual resilience and adversity

How is individual resilience impacted by adversity? The following arguments are gathered in a literature review (see Appendix 1 for further information). In general, the literature regarding individual resilience in light of adversity finds common ground, although not much empirical research has been conducted to validate the theoretical constructs and definitions with regards to individual resilience in a work environment. Nevertheless, the definitions as mentioned by the different authors emphasize slight differences in the choice of words as well as belonging dimensions, which will be highlighted in the following as well.

Goldschmidt, de Paiva, and Irigaray (2019) as well as Ferguson et al. (2013) share the theoretical reasoning that individual resilience exists only under two conditions: The individual must be exposed to adversity and has to adapt positively to be resilient. This underlines the interdependent relationship to adversity (Vagero, Aronsson, & Modin, 2018). However, whereas Ferguson et al. (2013) focus on the context dependence in adversity and see only the successful adaptation as further characteristic, Goldschmidt et al. (2019) state clearly that the resilience capability increases after overcoming an adverse situation, which they ground on theoretical reasoning. The authors give the following definition for organizational resilience: "Organizational resilience is the procedural, dynamic, and ecosystemic capacity activated by persons (individual resilience) and processes (systemic resilience) in the face of adversity for a response, which allows the recovery of balance and the performance of healthy adaptation, through the activation of elements or assets in the subjective or internal and objective or external plans, which might be reinforced or renewed during the process, guaranteeing the sustainability of the resilient result and/or the expansion of the resilience capacity" (Goldschmidt et al., 2019, p. 42). Three elements are vital for the definition of resilience: 1. Generation of a response which supports the balance and performance of healthy adaptation, 2. Expansion of the resilience capacity AND/OR 3. Maintenance of sustainable resilience.

With an assessment of potential factors associated with resilience, Wojciak, McWey, and Waid (2018) support the improved outcomes after the adversity due to resilience. In their qualitative study related to wildfires, the interviewees also viewed their resilience as keeping up with the work, growing in strength and developing further (Kulig & Botey, 2016). However, Wojciak et al. use a different choice of words: "Resilience as a factor that can be influenced through the interplay of risk and protection in ecological context" (p. 9). Although this conceptualization differs from the one by Goldschmidt et al. (2019), it shows similarities. The balance of protection and risk factors as well as the ecological context is in line with the earlier mentioned

balance of healthy adaptation. As a context-dependent construct, individual resilience further manifests with the maintenance or successful overcoming of adversity according to Ferguson et al. (2013). Complementary to that, Richter, Kramer, Diekhof, and Gruber (2019) explain that the interaction between resilience and the adversity might differ depending on the situation. Additionally, what can also be found when looking at the conceptualizations by different authors is the extent of grounding in the contextual factors. The nature of the reaction can also depend on the situation the individual finds himself in, which the different authors embed in their conceptualization in different ways: "activation of elements or assets in subjective or internal and objective or external plans" (Goldschmidt et al., 2019), "in ecological context" (Wojciak et al., 2018, p.9 ), "Components essential to natural resilience are as follows: personality, (physical) environment and economy" (Kulig & Botey, 2015, p.5-6), and "social interactions within the community that enhanced its recovery and hence resilience" (Kulig & Botey, 2015, p. 8).

Rook et al. (2018) define that more resilient individuals demonstrate a larger capacity to quickly regain a balance after stressful situations and focus especially on workplace resilience. After challenging events, protective as well as coping skills are increased compared to before the disruption, which highlights the impact of the adversity. Phillips et al. (2016) share this view and additionally introduce a difference based on gender: early adversity potentially influences men and women differently, with women adapting positively in comparison to men.

Accordingly, although the authors disagree in some instances whether the adaptation after the adversity is aimed at maintaining a pre-level resilience or whether the resilient capabilities increase after adversity, the successful adaptation is based in the choice of words by the authors: "Recovery of *balance* and performance of healthy adaptation […], guaranteeing the *sustainability* of the resilient result and/or *expansion* of the resilience capacity" (Goldschmidt et al., 2019, p.42), "ability to 'bounce' back after an affliction, to a *pre-adversity level* of functioning" (Eshel et al., 2017, p. 160), "Those who are able *to adapt positively* to such risks and threats develop a resilience" (Phillips et al., 2016, p.1) and "cope under pressure and an ability to *return to a pre-stress state* soon after the stressor has occurred" (Rook et al., 2008). It becomes evident here that the "successful" adaptation might mean different things: In some instances, the choice of words emphasizes that returning to pre-adversity resilience is successful, as it means to overcome the adversity in a positive matter regarding the negative consequence that arises – or rather did not follow due to resilience – whereas other authors

mention the positive adaptation. This could mean both the overcoming in terms of no negative consequences, but also to come out of the crisis with enhanced resilience capabilities.

This theme also emerges under a group of authors (Eshel et al., 2016, Eshel et al., 2017, Eshel et al., 2018), who describe individual resilience as a process of *reestablishing* pre-adversity positive adaptation. This process is characterized by a strengthening of protective factors and the *overcoming of risk factors* as part of the definition of resilience – "Balance of individual strength (protective) factors and vulnerability (risk factors)" (Eshel & Kimhi, 2016). The choice of words differentiates from earlier mentioned conceptualizations, as it addresses individual strength and vulnerability factors, which also adds an interesting perspective to earlier mentioned literature: Earlier, we already read about the 'balance', 'risks and threats', but the definitions stayed at a surface level, whereas the balance of individual strengths and vulnerability and the balance with distress symptoms as impacting the reaction to adversity goes to a deeper level beyond the pure positive adaptation or maintenance. Eshel et al. (2018) specifically address both positive and negative components of resilience and state that "post-adversity strengths *successfully counter distress symptoms*, whereas a level of vulnerability which is higher than post-adversity strengths will often result in poor adaptation" (p.4).

Accordingly, the research group around Eshel states that most distress symptoms do not show more than little disruptions after adverse situations, increasing the difficulty to measure the construct of resilience and the change therein. This group of authors also shares the view that the maintenance or increase of functioning capabilities depicts the benchmark of individual resilience (Eshel et al. 2017) and is therefore congruent with earlier research, despite a different choice of words and a differing level of detail. Vagerö et al. (2018) also address the possible negative adaptation and coin the term susceptibility. They state that repeated adversity with successful responses constitutes a *dynamic learning process*, but luck, experience and genes might heavily influence the process. They add that if a failure to cope persists the repeated adversity, susceptibility will impact every reaction to further adversity. This means that resilience is not a naturally happening process but also depends on further underlying dimensions.

The review of papers gives evidence for the formulation of a hypothesis regarding the research question. We expect an impact of the adversity, with a dynamic process which potentially changes in light of adversity. However, authors do not find congruence whether a positive adaptation leads to a maintenance of the level of resilience or to an increase post-adversity. The

context of the adversity as well as the individual also play a role in the level of resilience, as we will address in the qualitative parts.

Based on the arguments as established by the literature review, we predict that there is no significant difference between the level of individual resilience before and after the adversity. As already stated, the majority of authors finds congruence in the impact of adversity on resilience, but it is not clear whether the maintenance or increase in resilience stands in the foreground when impacted by adversity. We formulate our first hypothesis as follows:

*$H_1$: There is no significant difference between the level of individual resilience before and after the adversity.*

## 2.4 Innovative work behavior (IWB)

Generally, the innovative capacity is gaining importance due to the volatile and radically changing environment that increases in complexity as well, creating the need to find new and creative solutions for ever-changing demands. High-performance levels of organizations can be traced back to innovative behavior at the workplace (Eskiler, Ekici, Soyer, & Sari, 2016), which can be conceptualized as individual behavior that contributes state-of-the-art and favorable ideas, work processes, products and procedures to the workplace (De Jong & Den Hartog, 2010; Farr & Ford, 1990). Siregar and Senen (2019) mention the underlying characteristics of IWB as not being satisfied with the present state of affairs and constantly searching for the development of methods and processes. IWB can include a large range of behavior, for example, incremental developments as well as state-of-the-art, radically thought-of new concepts (Swaroop & Dixit, 2017).

Innovative work behavior is distinguished by four dimensions by several authors (De Jong & Den Hartog, 2010): idea exploration, idea generation, idea championing, and idea implementation. Idea exploration focuses on finding opportunities for improvement and finding an alternative for current ways of operating (Farr & Ford, 1990; Kanter, 1988). As the next element, idea generation holds as key to combine and reorganize information, modules and constructs to improve processes or increase performance (Kanter, 1988). Promoting the ideas is relevant after generation in the championing dimension. Overcoming the resistance to change and finding a way to legitimize the idea are natural processes of realizing innovative ideas (Kanter, 1988). Finally, the implementation of ideas happens, distinguishing the IWB processes of creativity (De Jong & Den Hartog, 2010). Including innovations as part of day-to-day

processing is key to the successful operation of innovations (Kleysen & Street, 2001) and belongs to the fourth dimension.

Measurement scales have been developed for IWB as well, for example, the scale for Innovative Work Behaviour developed by Janssen (2000). The scale combines different earlier developed scales (Kanter, 1988; Scott & Bruce, 1994) and validated 9 innovative work behavior items as can be seen in table 3.

*Table 3: The 9 innovative work behaviors by Janssen et al. (2000)*

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|---|
| Creating new ideas for difficult issues (idea generation) |
| Searching out new working methods, techniques, or instruments (idea generation) |
| Generating original solutions for problems (idea generation) |
| Mobilizing support for innovative ideas (idea promotion) |
| Acquiring an approval for innovative ideas (idea promotion) |
| Making important organizational members enthusiastic for innovative ideas (idea promotion) |
| Transforming innovative ideas into useful applications (idea realization) |
| Introducing innovative ideas into the work environment in a systematic way (idea realization) |
| Evaluating the utility of innovative ideas (idea realization) |

## 2.5 Innovative work behavior and adversity

The literature concerning innovative work behavior in light of adversity is relatively scarce. Most researchers regard innovativeness in adverse times as connected to resilience or as part of resilience (see Appendix 2 for the full literature review), even though not always connected to individual resilience. For example, De Clercq and Pereira (2019) have found a positive relationship between employee resilience and disruptive creative behavior, with adverse work conditions as mediators. Disruptive creative behavior is here conceptualized as the generation of radically new ideas for improvement.

As another example, Hmieleski, Carr, and Baron (2015) report based on a survey with 223 founding CEOs regarding human, social and psychological capital, that especially educational attainment, network ties and psychological capital – which includes individual resilience amongst other concepts – influence firm performance in uncertainty positively. So, especially in adverse times, resilience can support innovativeness and therefore firm performance. Hallak, Assaker, O'Connor, and Lee (2018) report an effect of entrepreneurial resilience on innovation due to the market disruptions and demand shifts they see in the restaurant industry of their study

and base this on the impact of creative self-efficacy. Further, they see that the firm's degree of innovation impacts firm performance.

Despite this first glance at innovative work behavior, the aforementioned articles concentrate on innovative work behavior as well as resilience, which is not the focus point of this section, but rather the next one. The connection is partly inevitable, as the recovery from adversity or the rehabilitation process always has to deal with levels of resilience, which puts the concept at the heart of research in this regard. Nevertheless, due to the scarcity of research on the sole topic of innovative work behavior in light of behavior, some articles can contribute to this topic as well, which is why they are mentioned in this section.

On a general level, different articles can contribute to hypothesis building and we will compare the choice of words of the authors to reach a hypothesis regarding IWB in light of adversity. The concept of disruptive creative behavior for example addressed by De Clerq and Pereira (2019) has substantial overlap in meaning with several other definitions of other authors, although the level of analysis differs and the literature finds itself in different contexts, from HRM to social entrepreneurship.

Bendickson, Madden, McDowell, and Gur (2019) find that entrepreneurs face multiple psychological stages that follow a disaster, in which each show recovery efforts, stakeholder activities, and emerging opportunities. The psychological perspective is covering the cognitive dimension of disaster recovery and resilience, but on a separate level, the innovative efforts are required as part of the recovery process. Bendickson et al. (2019) mention *entrepreneurial opportunity recognition*, emphasizing the impact of the adversity on the entrepreneurial culture and its reinforcing effects on entrepreneurial opportunity recognition. This means that to deal with adversity, the innovative capabilities have to change, to recover from the crisis. The authors further emphasize the importance of entrepreneurial culture, "especially in the face of external shocks" (Bendickson et al., 2019, p.19).

Malik et al. (2019) share this view, but chose a different style of words: The authors focus on creating an *ambidextrous environment* described as supporting in adverse situations, which means in turn that the "simultaneous development of *exploitative routines and exploratory non-routines* can be achieved" (Malik et al., 2019, p. 560). Malik, Sinha, Pereira, and Rowley (2019) examine how global IT firms manage growth in adverse times and what strategy choices can support sustaining growth, concluding that different *ambidexterity designs* help to deal with adversity. Cross-functional teamwork, commitment to quality and continuous improvement as

characteristics of innovativeness contribute to ambidexterity. Ambidexterity can in this context be divided into temporal, structural and contextual processes, where all processes include exploration as well as exploitation, meaning that innovativeness is posed as a necessity for maintaining ambidexterity and firm performance. The conclusion to take with for this study is that the processes of ambidexterity include innovativeness, signing that to deal with adversity, the innovative capabilities change in various perspectives, e.g. temporal, structural and contextual processes.

Further, Bastian, Jetten, Thai, and Steffens (2018) find in their study of social interactions and *creativity* in adversity that the sharing of adverse experience increases the support between members, which in turn improves creativity. They conclude that social bonds might be the reason for increased creativity, however, they report that the creative capabilities change under the influence of adversity. Bastian et al. (2018) specifically state that the team was less innovative before the adverse situation, but refer to the limitation that this can also arise from the increase in social interaction. Edson (2012) focus on the team perspective, too, and see that *creative destruction and adaptive learning as dimensions of innovativeness* increase in the light of resource constraints as an adverse situation. Edson (2012) uses the variable proxy creative destruction for adversity and defines the relationship as follows: "An organization encounters an adversity such as economic regression, market shifts, or regulatory changes. The organization reevaluates its position, releases forms, processes and/or norms [...] and develops solutions that not only maintain the organization's function towards meeting its goals but also exceed expectations. As such, *creative destruction is often a precursor to innovation*" (p. 508). Walter, Parboteeah, Riesenhuber, and Hoegl (2011) reach the same conclusion but focus rather on *innovation championing behavior*. Although this term concentrates more on the advocating of ideas, Walter et al (2011) conclude that the relationship between adversity and innovation success takes the form of an inverted U. Despite innovation success not being equal to innovative work behavior, as the later excludes the succeeding of the idea and concentrates rather on the trials and errors connected to the innovation process, we can conclude that perseverance in adversity impacts innovativeness positively – up to some level - according to Walter et al. (2011).

Williams and Shepherd (2016) see a different direction and refer to venture creation as a mediator between human capital and post-disaster functioning. This case is very specific and refers to the social venture creation of victim entrepreneurs, but add a slightly different direction to earlier mentioned literature – "Individuals who are victims of the disaster and apply their

existing resources by engaging in the *creative and intensely demanding activity of venture creation* are more likely to experience *positive functioning outcomes*" (Williams & Shepherd, 2016, p. 366).

Building on the rehabilitation process as part of venturing, Kwong, Cheung, Manzoor, and Rashid (2019) examine the behavior of entrepreneurs in responding to adversity. The authors see different ways of adaptation and especially internal and external bricolage as strategies. Bricolage can be defined as a way of dealing with resource scarcity, often found in entrepreneurship and environments requiring innovation, characterized by unique challenges in dysfunctional markets (Di Domenico, Haugh, & Tracey, 2010). 'Making-do' with the resources at hand through skills, knowledge and capabilities for compensation is mentioned here as a vital part of the rehabilitation process in adversity – that means, *bricolage* as a strategy supports the increase in innovativeness and therefore the dealing with the adversity. Bricolage acts here as a proxy for the behavior, which determines how people deal with adversity leading to a positive outcome. This is supported by Langevang and Namatovu (2019), who research how young people make use of bricolage for social change in adversity. With peer mobilization, pluriactivity and rekindling culture as main parts of innovation, they see that mutual support mechanisms play a big role in facilitating innovativeness. Under adversity, the 'making-do' with resources at hand supports the continuous innovative activities to deal with ongoing crisis.

Best and Gooderham (2015) report a similar conclusion in their article about entrepreneurs in adversity and *improvisation* is used in challenging situations – "Improvisation is seen and used by entrepreneurs as a legitimate response to adversity" (Best & Gooderham, 2015, p. 64). Intuition, creativity and bricolage can contribute to improvisation during adverse times and enhance creative solutions, meaning that innovation capabilities get stronger during adversity. This is connected to the concept of bricolage: FI resources are limited and make planning impossible, certain actions have to be taken in uncertainty, facilitating more innovative decisions and creative progress.

Also focusing on exploration, but in the case of new product development, Choi and Phan (2014) investigate if adversity impacts *exploration as well as exploitation* and whether the influence increases new product development. They find that innovation – specifically exploration – increases in times of adversity. Although the exploration vs. exploitation focus of the SMEs as units of analysis is not explicitly studied, the authors find that mature firms are more sensitive to adversity. The level of exploration is lower in mature than in new firms but

rapidly increases in adversity for both types of firms. This signifies again that the level of innovativeness changes in times of adversity.

A counter argument for the aforementioned literature, which generally takes the same direction and reaches a similar conclusion, is built by Barrett, Vessey, Griffith, Mracek, and Mumford (2014). They find that adversity does not predict *creativity*. However, adversity is in this context defined for instance as distrust from a supervisor or need to fight into the field in scientific research, which differs from conceptualizations used before and focuses on a very specific field of research.

In its basis, the authors share the view of the aforementioned literature: The adverse situation stimulates the *innovative capacity* – no matter if the behavior takes place as entrepreneurial opportunity recognition, innovative work behavior, venture creation or creative destruction. Although the proxies for the variables take different perspectives and are based in different contexts, the literature does not face many discrepancies but reflects a relatively complementary view of IWB in light of adversity. After reviewing the literature in this field, it can be said that most researchers view innovative work behavior as positively changing in the context of adversity. Although different views exist regarding the contextual processes and underlying factors as well as how specifically the concept changes, the following hypothesis can be stated for our research:

*$H_2$: There is a significant difference between the level of innovative work behavior (IWB) before and after the adversity.*

## 2.6 Relationship of individual resilience and IWB

The relationship between resilience and innovation takes many forms in different topics, although research reaches consensus in the connection between the two concepts (see Appendix 3 for the full literature review). For example, Euchner (2019) argues that the connection is undeniable, as innovation necessarily disrupts businesses and resilience supports the adaptation to disruptions, linking both aspects together. Although resilience incorporates the idea of being mentally stable towards changes, disruptions and adverse situations, "stability and change are not paradoxical, but part and parcel of resilience" (Morais-Storz, Platou, & Norheim, 2018, p. 1158).

A quotation of Euchner (2019), written as an editor's note for an edition about 'Innovation and resilience', fits well in this context:

*"Resilience is about more than surviving; it's necessary to keep growing. It's what allows a company to adapt as markets change and new technologies emerge. Resilience is essential for innovation because, almost by definition, innovation disrupts the business."* (Euchner, 2019, p. 10)

In the following part, we aim at identifying the similarities and discrepancies between authors about why the two concepts are related. Because the literature on individual resilience and innovative work behavior is scarce, we focus on the search terms as listed in appendix 3. This enables us to form a hypothesis based on transferring knowledge and combining literature.

Azevedo and Shane (2019) found in their longitudinal pilot study of MBA students and professors about the introduction of a new cultural intelligence training program that *IWB and resilience are both preceded by cultural intelligence*. Both variables face a significant increase compared to the pretest in the group of MBA students. Although the study found a similar increase in both behaviors when comparing pre- and post- test surveys, Azevedo and Shane did not conclude anything about the direction of the concepts but rather focus on the embeddedness of the mutual characteristics.

In contrast to that, Bustinza, Vendrell-Herrero, Perez-Arostegui, and Parry (2019) find that *resilience mediates the relationship between technological capabilities and organizational effectiveness*. The authors describe the technological capabilities as a capacity to establish, implement and organize technological developments (Bustinza et al., 2019), which resembles characteristics of innovative work behavior. Therefore, the concepts overlap and the variable can be used as a proxy for innovative work behavior.

In another context, Mafabi, Munene, and Ahiauzu (2015) examine the mediating role of adaptive capacity in creative climate and organizational resilience. They argue that the *mediating effect is the adaptive capacity to resist any adversity, by developing structural, process and competence innovation*, which resembles the definition of resilience to adapt to and overcome adversity. In contrast to earlier mentioned literature, this article focuses more on the organizational level and the limited mediating effect of innovation on resilience, but they still add to the argument that innovation precedes resilience. Looking at the concepts in more detail shows that the authors conceptualize innovation as structural, process and competence innovation and aim towards internal innovations in the firm. That does not necessarily mean that the concepts of innovative work behavior and adaptive capacity are congruent, but yet it adds to the proceedings on this ground by emphasizing the overlap of concepts: Innovation and

resilience are no contrary behaviors, but are complementary and partially own the same characteristics, especially when embodied in a term like adaptive capacity.

Branicki, Sullivan-Taylor, and Livschitz (2018), Hallak et al. (2018) and Hmieleski et al. (2015) all see resilience as supporting innovativeness in light of adversity. Innovative work behavior (or its proxy) is seen here as a way of overcoming the challenge. Branicki et al. (2018) address the complementary characteristics of resilience and innovativeness, and state that the entrepreneurial mindset contribute to resilience, making the adverse situations key to develop innovativeness. Hallak et al. (2018) examine the effect of *resilience on creativity* and find that resilience has a positive impact on *creative self-efficacy and firm innovation.* Distinguishing between creativity (conceptualized as creative self-efficacy) and firm innovation, the authors find that both behaviors are impacted by resilience. Hmieleski et al. (2015) examines the relationship of human, social and psychological capital with firm performance in uncertain environments and finds that especially in adverse times, resilience supports innovativeness and therefore firm performance. Despite using slightly different concepts or focusing on varying perspectives, these authors come to the same conclusion.

Additionally, some literature has been developed that directly views the concepts as intertwined: For example, Todt, Weiss, and Hoegl (2018) focus on *innovator resilience potential*, which mediates the relationship of social support and the project commitment of the innovators. The term was specifically coined in organizational innovations and focuses on the future functioning of innovative capacities. Termed slightly differently as *innovation resilience behavior*, Oeij et al. (2017, 2018) construct and validate a scale with high-reliability organizations characteristics to measure the concept and further examine the relationship to mindful infrastructure. In a survey with 260 team members of project teams, they found a positive relationship between innovation resilience behavior and perceived project progress as well as success. In an earlier study, Oeij et al. (2016) stated that mindful infrastructure is resilience on an organizational level and a necessary, but not sufficient condition for innovation resilience behavior. This means that organizational resilience is an antecedent of *innovation resilience behavior, which in turn facilitates innovative behavior as it describes the resilient behavior to resist and overcome change*, keeping the capacity to be innovative ("Capacity […] to withstand and overcome critical incidents in a manner that enables sustained activity toward the goals of the innovation project by critical recoveries" – Oeij et al., 2017, p. 50).

The construct of innovator resilience potential as studied by Moenkemeyer et al. (2012) reflects this view: the construct of innovator resilience potential captures the potential for innovations

after the initial innovation project was terminated, *showing resilience as a process to continue innovative activities after termination*. Moenkemeyer et al. (2012) also address the mutual characteristics of resilience and innovative work behavior and categorize the underlying qualities as malleable and stable. This is discrepant with the conceptualization of resilience as a state or resilience as a trait because it views the concepts from another perspective: Rather than having the concept changed – or not changed - by the situation (resilience as a trait/state), the underlying concepts can be either changeable or fixed, but the concept can have both types of characteristics.

Specifically in the workplace, the *positive relationship between employee resilience and disruptive creative behavior* holds place, as studied by De Clercq and Pereira (2019). Creative behavior is in this context conceptualized as the generation of disruptive new ideas for improvement (De Clercq & Pereira, 2019). The authors focus here on the conservation of resources theory, which focuses on leveraging personal resources to generate resource gains by activities like innovative work behavior. Employee's resilience enables them to overcome the resistance and adds to wellbeing, meaning that it displays such a personal resource. This supports the claim that creativity generates resource gains and creates a sense of meaningfulness through innovativeness. Further, the authors state that resource gains protect against adversity, as adverse situations channel the resilience into innovative activities that act against the workplace adversity.

This is also reflected in the research of Cameron, Moore, Montgomery, and Stewart (2018). Their qualitative exploratory study was conducted 5 years after earthquakes in New Zealand to study the influence of the environment of entrepreneurial activities. In their case study, the adversity made the environment more supportive and encouraged entrepreneurs to take the chance to exploit opportunities, but they also found considerable differences in the characteristics of founders. Especially social ventures were discontinued, potentially due to the excess of agreeableness (Cameron et al., 2018). Although the term resilience was not specifically mentioned in the research, it has some points to take into consideration: the different reactions of entrepreneurs might be due to different states of individual resilience, which enable them to deal with the adversity in various ways and ultimately influence the level of innovativeness. This argumentation also reflects the argumentation of Morais-Storz et al. (2018): Investigating the meaning of resilience in VUCA environments, they conceptualize strategic resilience as an emergent and dynamic organizational resilience that facilitates innovation. Especially entrepreneurship and strategic resilience together focus on value capture

as well as value creation. Morais-Storz et al. (2018) therefore see the two concepts as embedded as well and contribute to the wide tapestry of literature. What does this mean with regards to individual resilience? By stating that strategic resilience largely depends on "a deliberate practice of strategic problem formulation, the future-oriented belief system […] and the antecedent of organizational legacy" (Morais-Storz, 2018, p. 1182), the authors build a bridge to individual resilience. This is based in the believe that to facilitate *deliberate* problem formulation and to form a *future-oriented* belief system, individual resilience is likely to be necessary.

Richtner and Lofsten (2014) as well focus on the needed resources in turbulent environments and view creativity as a way to manage. They define structural, relational, cognitive and emotional resources as dimensions of organizational resilience, where especially the latter two influence creativity within the organization, further contributing to the view that resilience influences innovation. They state that "if levels of resilience are low, this leaves little room for employees to fail, recover, and try again, a process necessary for successful creativity – and at the end of the day, innovation" (Richtner & Lofsten, 2014, p. 146). This conceptualization finds further dimensions of resilience on an organizational level but comes to a similar conclusion as Morais-Storz et al. (2018), Branicki et al. (2018), De Clercq and Pereira (2019) and others. Especially interesting is here to transfer the conceptualization to individual resilience: If organizational resilience already depends on different resources, e.g. cognitive and emotional, then individual resilience is also likely to be related to that. Can organizational resilience be seen as a network of individually resilient people? Does individual resilience build up? The conceptualization of structural, cognitive, emotional and relational resources could also refer to the capacity to be individually resilient.

Some attention in research has also been aimed at the concepts of resilience and innovation with regards to social and psychological capital: Fandino, Formiga, and de Menezes (2019) conducted a survey with 21 Portuguese companies, where they proved the relationship between individuals' resilience and innovation, mediated by organizational social capital. Both Yu, Li, Tsai, and Wang (2019) as well as Sweetman et al. (2011) see resilience as part of the psychological capital, among efficacy, hope and optimism. Similarly, both articles see a significant positive relationship between resilience and creative performance. As embedded in the concept of psychological capital, Sweetman et al. (2011) claim that resilience is rather sustaining employees' creativity than starting it off, so the concept is not focused on the mechanisms by which creativity is generated, but rather on the sustaining effort toward

achieving innovations. This is grounded specifically in the literature around psychological capital.

Although most of the research regarding the two concepts see some construct relating to resilience (e.g. strategic resilience, team resilience, organizational resilience) as the independent variable and some construct relating to innovation (e.g. creative performance, creative climate, innovative behavior) as the dependent variable, there has also been some research that views it differently. Sabahi and Parast (2019) for instance examine whether more innovative firms also are more resilient concerning supply chain disruptions. They argue that innovation positively impacts the skill to manage risks and state that knowledge sharing, agility and flexibility mediate the relationship between innovativeness and supply chain resilience. Sabahi and Parast (2019) also introduce the dynamic capability perspective. Following this theory, resources are responsible for developing a firm's capabilities, which are in turn source of competitive advantage. In this regard, the innovative approaches of the firm are a resource, ultimately influencing the capability of resilience.

The same holds for Golgeci and Ponomarov (2013), who identified the relationship between organizational innovativeness as a dynamic capability and supply chain resilience. As supply chain resilience is the outcome of a design process, like for example material design and its robustness, these findings ultimately do not contribute to the hypothesis in a meaningful way, but rather show that resilience is a widely used term and scholars use it differently.

On an organizational level, Marwa and Milner (2013) examined the creativity and its influence on resilience. They argue that soft organizations that invest in creativity also build up resilient behavior. This does not mean that they necessarily see creativity as an antecedent of resilience – it rather seems that creativity can also be seen as a corporate value, as an organizational setting with 'soft' skills rather than 'hard' skills instead of the concrete behavior associated with it.

As can be seen, the literature regarding the connection of innovation and resilience has various facets, but ultimately, some conclusions can be drawn to state a hypothesis regarding the research question. Although literature does not find consensus in which concept predicts the other and takes several directions – IWB predicting resilience, resilience predicting IWB, a sole association between the concepts – we hypothesize that there is a relationship between the two concepts. This leads to the following hypothesis:

*$H_3$: The relationship between the level of individual resilience and innovative work behavior in light of the adversity is significant.*

In this regard, we further find some underlying concepts which are addressed in literature: For example, Hmieleski et al. (2015), Richtner and Lofsten (2014), Fandino et al. (2019), Yu et al. (2019) and Sweetman et al. (2011) all address the topic of psychological capital or personal influences on the job of individuals and the potential impact on the way resilience and innovative work behavior are handled. Moreover, with variables like creative climate (Mafabi et al., 2015) and mindful infrastructure (Oeij et al., 2016; Oeij et al., 2017; Oeij et al., 2018), the environment also might play a role in the relationship of resilience and IWB. Todt et al. (2018) also address the topic of social support on the impact of adversity and Bustinza et al. (2019) as well as Hmieleski et al. (2015) emphasize the influence on organizational effectiveness or firm performance. These underlying concepts which arose from the literature analysis might help in the qualitative supplement, as we will address later.

# 3. Methodology

## 3.1 Study 1: Quantitative analysis

The dataset as part of a larger research survey was kindly provided by J. C. Kuijpers (2019) and contains the data of 78 participants, of whom all worked for the case company. The participants were asked to fill in a 7-point Likert scale for the 9 items for individual resilience (Näswall et al., 2019) as well as 9 items for innovative work behavior (Janssen, 2000) according to the scales explained earlier (see table 2 and 3). We introduced the two conceptualizations of resilience – as a trait and as a state – in an earlier part, but we will continue to use the idea of resilience as a state in this context. The reason for this is that we study resilience in a dynamic context in light of adversity, hypothesizing that the level of resilience might change.

The earlier survey was conducted two times; once before the adverse situation was communicated, and once after. Not all respondents participated in both waves. The first wave of surveys was also conducted without the knowledge of any adversity and initially aimed at another research topic, but can now be used as an independent measure of individual resilience and innovative work behavior before the dismantling of the case company was communicated.

The variables under question for subsequent analyses were especially innovative work behavior as the independent variable and individual resilience as the dependent variable.

To address the three hypotheses, different procedures were necessary. As preparation and for summarization of the scales, a principal component analysis was conducted. The objective of this as a first step was to construct variables from our measured items. As a cutoff-criterium, we used eigenvalues greater than one to get to latent variables and preferred an oblique rotated

solution (Oblimin with Kaiser Normalization). Both lack of correlation with other items as well as communalities were reasons to exclude variables.

As both variables – innovative work behavior and individual resilience – were measured at two points in time, we aimed at creating one factor for each variable for each point in time, creating a total of four factors (individual resilience wave 2, individual resilience wave 3, IWB wave 2, IWB wave 3) to enable the analysis of differences and the comparison of pre- and post-adversity. The first variable, individual resilience in wave 2, was initially measured by a 7-point Likert scale for 9 items (Näswall et al., 2019). Based on principal component analysis, we constructed one item accounting for 57,307% of the total variance with a Cronbach's alpha of 0.844, using 6 of the original items. The second variable, innovative work behavior in wave 2, can be summarized to a one-factor solution that explains 61,487% of the variance with an internal consistency of 0,920 (Cronbach's alpha). Innovative work behavior initially consisted of 9 items (Janssen, 2000) and continues to load on all items.

For the third variable, individual resilience in wave 2, one factor can be used in subsequent analyses, explaining 65,7% of the variance with an internal consistency value of 0,930 (Cronbach's alpha) and loading on all 9 original items. Fourth is innovative work behavior in wave 3 with 74,8% total variance explained. This factor is also loading on all initially introduced items and has a Cronbach's alpha of 0.957. The results of the principal components analysis indicated that it was suitable to use the factors for further analysis and proved the internal consistency of applied subscales with thresholds as suggested by Taber (2018).

Further, to detect the differences between pre- and post-adversity as hypothesized in hypothesis 1 and 2, the question arose whether to use a parametric or nonparametric test. Many scholars criticize the use of parametric tests for Likert scales, as – strictly seen – the assumption of continuous data is not fulfilled and the question of normality exists (e.g. de Winter & Dodou, 2010). According to de Winter & Dodou (2010), both tests come to nearly the same conclusion, although power differences exist in some cases. Therefore, a thorough examination of assumptions is necessary in the case of Likert scales.

For the third hypothesis, two distinct tests were used. First, Pearson's product-moment correlation was run to assess the relationship between innovative work behavior and individual resilience before and after the adversity was communicated. As a second part, a linear mixed model was run to account for the dependency in the data introduced by the repeated measures design. This procedure allows us to study the individual change over time and fits the data to

longitudinal data sets (West, 2009). Especially the mild assumptions regarding missing data and the relaxation of the independence assumption are advantages of this study design (Shek & Ma, 2011). Because the variables are overlapping, the linear mixed model can be designed to test the relationship between a predictor and an estimated variable. As literature does not give a clear suggestion concerning the direction of the relationship, we estimate both models and report the one fitting the best to our data. In our base model, the time (before and after the adversity was communicated) was modeled as a random factor to account for variation in the sample sizes and the level of innovative work behavior was modeled as a predictor variable. Data were available for 33 individuals that participated in both panel studies.

As we were interested in the relationship over time, we applied a LMMs model explaining individual resilience with IWB as covariate, using time as factor and the interaction of both as a further fixed effect. We additionally modeled the intercept of fixed effects as a random effect to account for differences between the points in time (West, 2009). Following the strategy of Shek & Ma, 2010), the best model was selected based on the likelihood ratio/deviance test (-2 log-likelihood), Akaike Information Criterion (AIC), Hurvich and Tsai's criterion (AICC), Bozdogan's Criterion (CAIC9 and Schwarz's Bayesian Criterion (BIC), determined by a smaller-is-better format. The information criterion among the covariance structure models can be seen in table 4.

Table 4
**Results of information criterion among two covariance structure models**

| Covariance structure | -2LL | AIC | AICC | CAIC | BIC |
|---|---|---|---|---|---|
| Unstructured Correlations (df = 33) | 118.227 | 126.227 | 127.116 | 137.875 | 133.875 |
| First-order autoregressive (df= 33) | 118.233 | 124.233 | 124.754 | 132.969 | 129.969 |

Although unstructured covariance structure is often supposed to give the best fit and is common in panel data analysis (Shek & Ma, 2010) the model using the repeated covariance type AR(1) for repeated measurements improved model fit (except for a slight difference in -2log), as suggested by West (2009) for adjacent observations on the same individual. Subsequently, the AR(1) model was retained for further interpretation.

As a supplemental analysis, a linear mixed effects model with IWB as the outcome variable is used, with fixed effects of resilience time and their interaction as well as an intercept as a

random effect. According to literature, researchers do not fully research consensus regarding the order of the concepts. Hence, we will test both models and decide on a best-fit basis.

Combined with Pearson's product-moment correlation, this gives a comprehensive basis for decision regarding the third hypothesis.

### *3.1.1 Robustness analysis*

To check the robustness of our results, we further analyzed a dataset of 302 answers to questions about resilience, innovative work behavior and adversity in the Netherlands. Provided by a research team consisting of Caniëls, Hatak, Kuijpers & de Weerd-Nederhof, the data was part of a panel study hosted by Kantar Public.

Although this data is not gathered at two different points of time while the potential dismantling became clear, it includes data about innovative work behavior, resilience as a trait, resilience as a state as well as adverse situations in form of challenge and hindrance stressors. Whereas our main analyses include the adversity as part of the study design, the robustness analysis uses stressors as a measurement of adversity and embodies it in the analysis. The detailed procedure as well as detailed results can be seen in appendix 4.

## 3.2 Study 2: Qualitative analysis

To explore what role the adversity plays in the individuals' resilience as well as innovative work behavior over time, five interview parts support the semi-structured interview (see appendix 5).

The interview protocol consists of five topics: General information, resilience, innovative work behavior, adversity and the process of resilience and innovative work behavior under the influence of the possible dismantling. The topics were addressed individually, as it is important to understand the personal perception of resilience, IWB and adversity and prepare the interviewee to answer how the resilience and IWB changed in light of the news. Because the questions are aiming at a sensitive topic that influences both personal and work life heavily, the build-up of questions starting with general, broad topics going to specific, sensitive topics was planned.

The six interviewees were prepared for the interview with a mail (see appendix 6). Each interview starts with a general introduction of the research highlighting the topics and the purpose of the interviews. The interviewees are then asked to sign an informed consent paper (see appendix 7) and are again asked for permission to record the interview. The interviewees

are given the possibility to answer in Dutch whenever they want to, which was used a couple of times throughout the interviews.

For the connection of the topics, the timeline mapping method of Kolar, Ahmad, Chan, and Erickson (2015) was used, which was also used by de Weerd-Nederhof et al. (2018) in resilience research. The methodological issue of addressing the change and the potentially traumatic influence under the adversity requires a sensitive approach. The timeline mapping method provides this option to supplement the narrative with a visual description and structure thoughts. The question as listed in the interview protocol are asked and then the interviewee will be given the time to draw before explaining it.

The data analysis follows a thematic analysis of the interview and timeline mapping data. This approach follows the objective to get to the underlying role of the topics and further impacts. The data analysis strategy further adheres to the hybrid process of inductive and deductive thematic analysis by Fereday and Muir-Cochrane (2006), which uses the data-driven inductive approach by Boyatzis (1998) and the deductive template of codes approach as described by Crabtree and Miller (1999).

The same method was applied to the second point of contact: These were conducted 6 months after the initial interview and aimed at further questions about individual resilience, innovative work behavior, the connection of both as well as the impact of the COVID19-crisis on their behavior. Due to the COVID19 situation, physical interviews were not possible, which is why the participants were given the possibility to call or to fill in a form.

# 4. Results

## 4.1 Results of study 1: Quantitative analysis

### *4.1.1 H1: Difference in the level of resilience before and after the adversity*

We used a paired samples t-test to determine whether there was a statistically significant mean difference between the level of individual resilience before the adversity as compared to after the adversity.

For the residuals of resilience between the two waves, the inspection of outliers through assessing a boxplot revealed one outlier that was more than 1.5 box-lengths from the edge of the box, but it was not extreme and therefore kept in the analysis. The difference scores for individual resilience in wave 2 and wave 3 are normally distributed, as assessed by Shapiro-Wilk's test ($p = .515$) and visual inspection of a Normal Q-Q Plot. Respondents did not face a

statistically significant difference in individual resilience when comparing before and after the adversity, t(20) = -.576, p = .571.

Table 5
**Results of the paired-samples t-test for H1**

| Residuals | Mean | SD | Confidence interval | | t |
|---|---|---|---|---|---|
| | | | Lower | Upper | |
| RES3 – RES2 | -.171 | 1.36 | -.79 | .44 | -.576 |

To conclude: There is no significant difference between the level of individual resilience before and after the adversity, as can be seen in table 5.

### *4.1.2 H2: Difference in the level of IWB before and after the adversity*

Again, a paired samples t-test was used to investigate whether the difference in the level of innovative work behavior was significant when comparing the level of before the adversity with the level after.

Investigating the assumption of outliers via the boxplot, one outlier became apparent. The outlier was not extreme and therefore kept in the analysis. The result of Shapiro-Wilk's test fulfills the assumption of normality with a value of .163 as well as the visual inspection of a Normal Q-Q plot. After the adversity, the participant's innovative work behavior faced a mean decrease of -.219, which did not prove to be statistically significant, t (20) = -.933, p = .362.

Table 6
**Results of the paired-samples t-test for H2**

| Residuals | Mean | SD | Confidence interval | | t |
|---|---|---|---|---|---|
| | | | Lower | Upper | |
| IWB3 – IWB2 | -.218 | 1.07 | -.707 | -.27 | -.933 |

To conclude: Hypothesis 2 can be rejected, as there is no significant difference between the level of innovative work behavior before and after the adversity, as can be seen in table 6.

### *4.1.3 H3: Relationship between individual resilience and IWB*

To answer the third hypothesis about the relationship between the level of individual resilience and innovative work behavior, two different analyses were run.

First, Pearson's product-moment correlation was conducted to assess the relationship between innovative work behavior and individual resilience before the adversity. 44 respondents answered in this wave. Preliminary analyses showed the relationship to be linear with both variables normally distributed, as assessed by Shapiro-Wilk's test (RES2 p = .107, IWB2 p = .181) and there was one outlier as highlighted in the scatterplot in figure 1.

There is a statistically significant, positive correlation between the level of innovative work behavior and individual resilience before the adversity, r (44) = .587, p < 0.05.

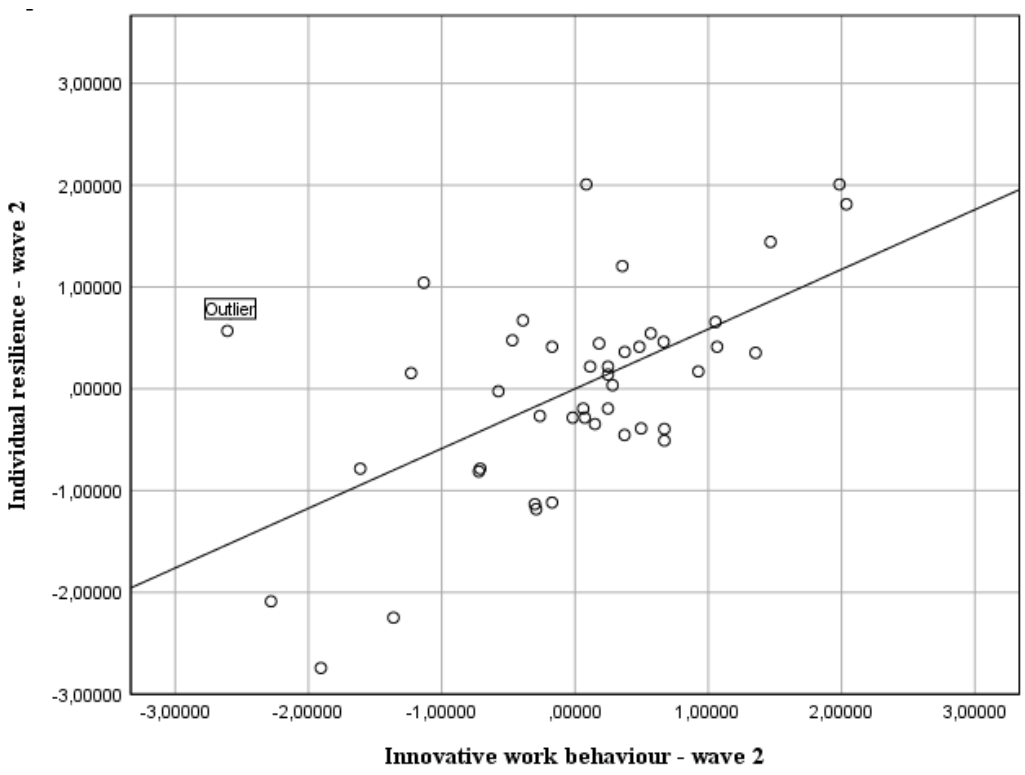


*Figure 1: Scatterplot of wave 2*

In wave 3, 33 respondents answered. Preliminary analyses showed that the relationship is linear with both variables normally distributed (see figure 2), as assessed by Shapiro-Wilk's test (RES3 p = .488, IWB3 p = .490). No outliers were detected. There was a statistically significant, strongly positive correlation between the level of innovative work behavior and individual resilience after the adversity, r (34) = .710, p < 0.05.

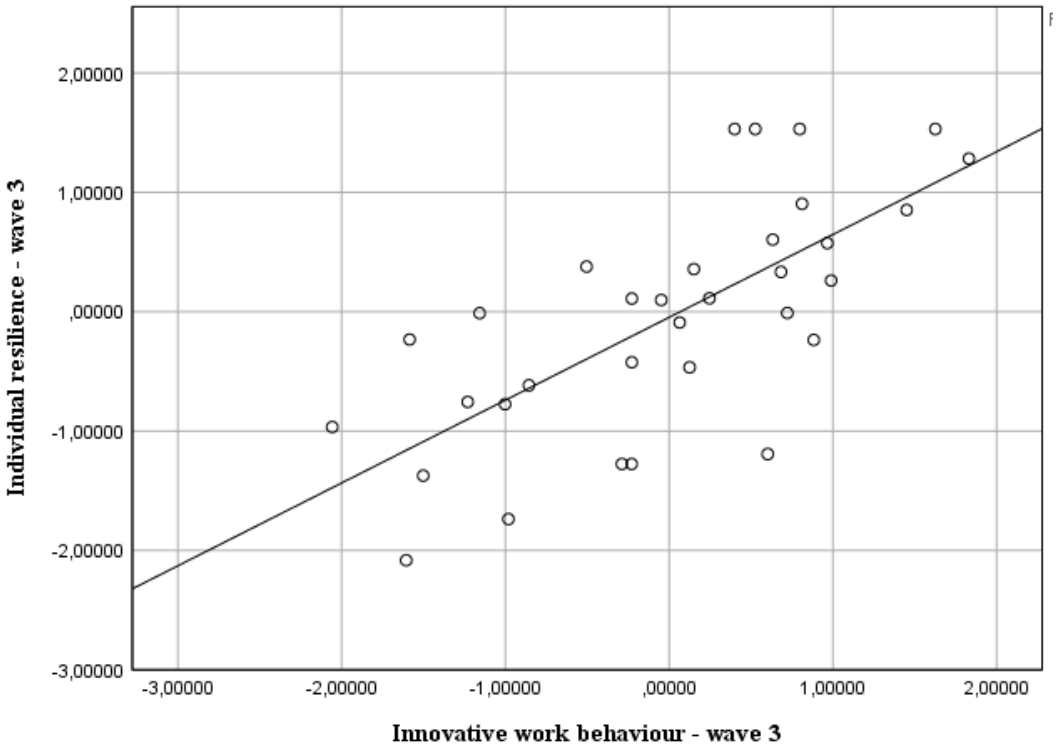


*Figure 2: Scatterplot of wave 3*

Accordingly – as can be seen in table 7 – individual resilience and innovative work behavior are significantly related both before and after the adversity. Both in wave 2 and wave 3, the correlation between the variables is highly statistically significant. Whereas in wave 2 the variables are correlated moderately, wave 3 signals a strong correlation according to Dancey and Reidy (2007).

Table 7
**Results of Pearson's product-moment correlation for wave 2 and 3**

| Point in time | N | Correlation | Sig. (2-tailed) |
|---|---|---|---|
| Wave 2 | 44 | .587 | .000 |
| Wave 3 | 33 | .719 | .000 |

Coming to the linear mixed model to address the third hypothesis, we fit a linear mixed-effects model with individual resilience as the outcome variable, with fixed effects of innovative work behavior, adversity and their interaction. Preliminary analyses show that there is a linear relation between predictors and outcome variables (see figure 3) and that the dependent variable

at Level 1 is normally distributed, as assessed by Shapiro-Wilk's Test (p = .479). Further, the random residuals are normally distributed and uncorrelated with the predictors, as assessed by a plot with standardized residuals and predicted values.

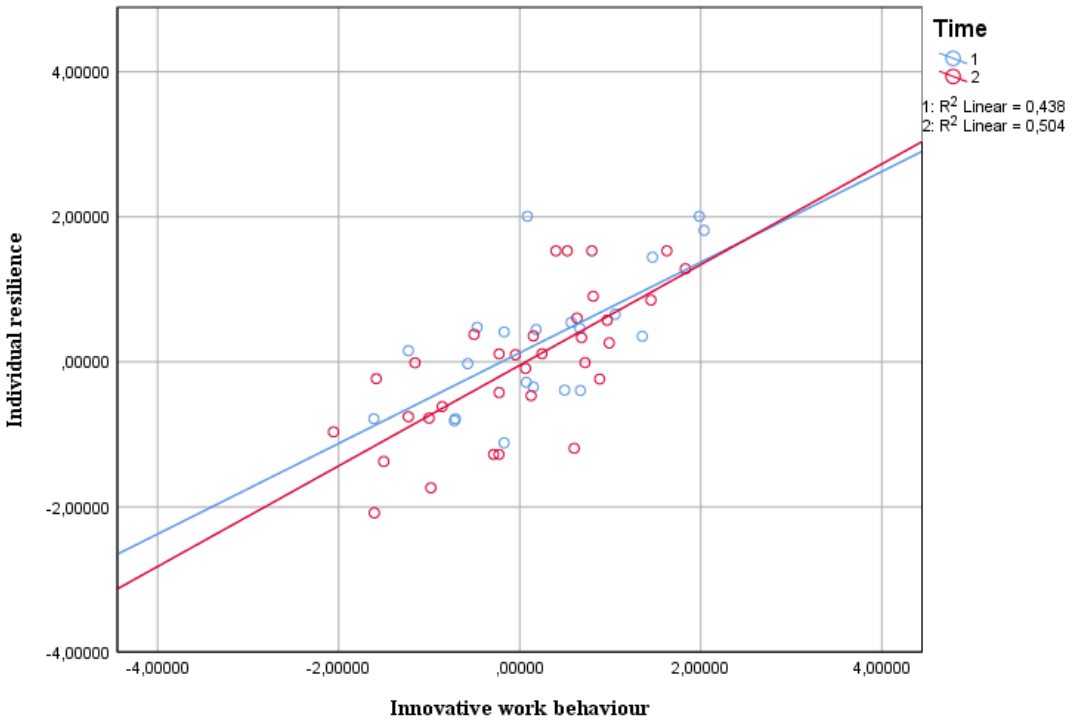


*Figure 3: Relationship of IWB and individual resilience before (time 1) and after (time 2) the adversity*

As we are interested in the relationship between IWB and individual resilience and whether it potentially changes under the influence of the adversity, we directly estimate a conditional linear mixed-effects model. In the first instance, we fit the intercept of the fixed effects as a random effect, following the procedure outlined by West (2009) and Leech, Caplovitz Barrett, and Morgan (2011).

In total, 7 parameters are estimated in our model: four regression parameters (the intercept, the linear effect of adversity, IWB and interaction of the adversity and IWB – fixed effects), one parameter linked to the intercept of the random effects, and two parameters linked to the random errors.

Looking at the estimates of the fixed effects (see tables 8 and 9), the conditional model suggests that innovative work behavior is a statistically significant predictor, F (1, 34.76) = 50.99; p <

0.001. However, the main effect of time as well as *Adversity*IWB* are not statistically significant predictors, p > .05.

Table 8
**Type III Tests of fixed effects**

| Source | Num. df | Denumerator df | F | Sig. |
|---|---|---|---|---|
| Intercept | 1 | 26.52 | .440 | .513 |
| Adversity | 1 | 32.012 | .926 | .343 |
| IWB | 1 | 34.77 | 50.99 | .000 |
| Adversity*IWB | 1 | 49.34 | .188 | .667 |

Table 9
**Conditional model of the relationship of IWB on individual resilience**

| Effect | Estimate | SE | df | t |
|---|---|---|---|---|
| *Fixed effects* | | | | |
| Intercept | -.46 | .12 | 47.631 | -.38 |
| [Adversity = 1] | .21 | .22 | 32.012 | .97 |
| [Adversity = 2] | 0[a] | 0 | . | . |
| IWB | .71*** | .12 | 49.203 | 5.86 |
| [Adversity = 1]*IWB | -.09 | .27 | 49.342 | -.43 |
| [Adversity = 2]*IWB | 0[a] | 0 | . | . |
| *Random effects* | | | | |
| *Repeated measures* | | | **Wald Z** | **Sig.** |
| Within-age variance | .40 | 40.83 | .01 | .992 |
| Between-age covariance (rho) | -.59 | 164.25 | -.004 | .997 |
| Between-subject variance | .09 | 40.83 | .002 | .998 |

a. This parameter is set to zero because it is redundant.

**p < .01. ***p< .001.

Table 10
**Results of information criterion among three covariance structure models, compared with re-run model without random intercept**

| Covariance structure | -2LL | AIC | AICC | CAIC | BIC |
|---|---|---|---|---|---|
| Unstructured Correlations (df = 33) | 118.227 | 126.227 | 127.116 | 137.875 | 133.875 |
| First-order autoregressive (df= 33) | 118.233 | 124.233 | 124.754 | 132.969 | 129.969 |

| Covariance structure | -2LL | AIC | AICC | CAIC | BIC |
|---|---|---|---|---|---|
| First-order autoregressive (df =33), without intercept | 118.233 | 122.233 | 122.488 | 128.057 | 126.057 |

None of the residual covariance parameters (see random effects in table 9) are statistically significant. For the intercept, we conclude that we do not need a random intercept (Wald Z = 0.002, p = 0.998), following the suggestion of Seltman (2018). Rerunning the model improves model fit as shown in table 10 but leaves test statistics for fixed effects as well as estimates of fixed effects remaining the same.

With the re-run models, the covariance parameters are newly estimated and define the structure of error covariance in the model, as shown in table 11. Associated with our observations linked to the fixed effects, the random error (AR1 diagonal) is estimated to be 0.49, suggesting a normal distribution with a variance of 0.49 (Estimate = 0.494760, p < 0.001). Following Leech et al. (2011), the significant AR1 diagonal suggests a large amount of variance within the different points of time (before and after adversity) – so, the levels of individuals for the independent and dependent variables differ largely within each point in time.

The insignificant AR1 rho indicates that covariation between the points of time is little, considering the variations of individuals (-0.27, p = 0.18).

Table 11
**Conditional model of the relationship of IWB on individual resilience**

| Effect | Estimate | SE | df | t |
|---|---|---|---|---|
| *Fixed effects* | | | | |
| Intercept | -.46 | .12 | 47.631 | -.38 |
| [Time = 1] | .21 | .22 | 32.012 | .97 |
| [Time = 2] | 0[a] | 0 | . | . |
| IWB | .71*** | .12 | 49.203 | 5.86 |
| [Time = 1]*IWB | -.09 | .27 | 49.342 | -.43 |
| [Time = 2]*IWB | 0[a] | 0 | . | . |
| *Random effects* | | | | |
| *Repeated measures* | | | **Wald Z** | **Sig.** |
| Within-time variance | .49*** | .010 | 4.88 | .000 |
| Between-time covariance (rho) | -.27 | .2 | -1.342 | .18 |

a. This parameter is set to zero because it is redundant.

**p < .01. ***p< .001.

As a supplementary analysis, we ran a linear mixed effects model with innovative work behavior as the outcome variable, with fixed effects of resilience, time and their interaction as well as an intercept as random effect. In the literature review, we found that researchers do not reach consensus regarding the order of the concepts, meaning that we focus on the association. As the first model with resilience as the outcome variable proves to be a better match in terms of model fit, we continue to interpret that one. However, in terms of results, it gives similar significant levels at the corresponding variables.

To conclude: There is a statistically significant relationship between the level of innovative work behavior and resilience, both before the adversity and after the adversity. The level of variation between the individuals at one point of time (e.g. before the adversity) is large, meaning that the respondents differ largely in their respective values. As opposed to that, the variance between the times - so the difference of the relationship when comparing the values before and after the adversity – is not statistically significant, meaning that the relationship of individual resilience and innovative work behavior consists independent from the adversity.

### *4.1.4 Robustness analysis*

To check the robustness of the results, we add to the third hypothesis by analyzing a dataset of 302 Dutch employees. The aim is to estimate the relationship of resilience and innovative work behavior while accounting for the difference of the types of resilience as well as including challenge and hindrance stressors as adversity measures. By testing several levels of the model as we did in the main analysis and differentiating between the different types of resilience, we focus on the model fit and the predictions based on the independent term.

The results show that resilience as a trait does not predict IWB in a significant manner. Resilience as a state is – in contrast to that – highly statistically significant. With interaction terms, we see differing results of the two types of resilience and their relationship with IWB as moderated by adversity: For resilience as a trait, we estimate an insignificant relationship on its own but notice that the interaction of both hindrance stressors and challenge stressors with resilience as a trait is significant. For resilience as a state, we see that both interaction terms are not significant.

Taking IWB as the independent variable, we see that it does statistically significantly predict resilience as a state, but the interaction effects are not significant. Accordingly, the adversity does not moderate the relation significantly. Resilience as a trait can be predicted by IWB in a statistically significant manner, and the stressors (i.e. the adversity) moderate the relationship.

In the results of our main analysis, we concluded that there is a statistically significant relationship between the level of IWB and resilience, both before and after the adversity and independent from the changes of the adversity. Our results in the robustness check add to this conclusion: We see that resilience as a state (which we focused on in the main analysis) predicts IWB with moderate effect size, but the relationship is independent from the interactions. This is confirmed when estimating the relationship with resilience as dependent variable: Again, the interaction terms are not significant. This verifies our findings from the main analysis. Additionally, we emphasize the difference of resilience as a state and resilience as a trait with respect to the impact of adversity.

## 4.2 Results of study 2: Qualitative analysis

Enhancing the results of the quantitative analysis, the interviews are aimed at gaining additional perspectives on the underlying influences, dimensions and processes of the individual's resilience and IWB concerning the adversity. Although the qualitative statements cannot find significant differences with the hypotheses, they can still be considered in their light, meaning that each of the hypotheses can form the basis for the analysis of the interview. This means that the qualitative analysis now pays special attention to how and why, for example, the resilience changes in view of the adversity, the innovative work behavior changes or how resilience and innovation behavior are affected as well as what factors might be influencing the relationships. Before focusing on the hypotheses-specific results, more context-specific information is explained for each of the interviewees, for example job description, the concepts of resilience and IWB and the attitude towards the adversity. The individual results per respondent can be seen in appendix 8, together with the timeline mapping pictures.

Taken together, the interviews give a unique view of the two concepts and reveal many dimensions. As the adversity has a different effect on everyone, the reactions and changes in behavior differ as well. Nevertheless, the six respondents can be distinguished into two groups, based on their opinions on the three hypotheses. Despite differences in each group regarding the underlying factors, the respondents have nearly similar opinions about the concepts, how the individual resilience and IWB changed and how the two concepts are related. Additionally, the results of the second contact point are also similar within the groups.

The earlier addressed propositions or hypotheses (as visualized in three columns in table 12) can be answered for the two groups separately, largely depending on the underlying factors, which is presented in the fourth column of table 13 for each of the hypotheses.

The first group of respondents, including A, B and C, experienced an increase in resilience and a constant or relatively similar level of IWB compared to before the adversity. They supported the relationship between resilience and IWB and emphasized that the fight to continue (also recovery from the adversity) requires innovativeness, which in turn needs resilient behavior to work with the obstacles. This shows a recursive circle of resilient behavior and IWB.

Although the three respondents show similar results, they differ slightly in terms of the underlying factors. Comparing the resilience before and after the adversity, all three of them reported an increase in resilience, displayed by a fast recovery. Especially respondent B and respondent C grounded this in the state of the decision, the passion and purpose of the job and the commitment to the company. Both were determined to keep the performance up, not giving further reasons for the dismantling, and are very passionate to keep helping the people. Additionally, they were committed to the company and believe in the purpose it fulfills, having a strong sense of loyalty. Respondent B also gave another reason: She experienced a change in the management structure, affecting her independence at work. Respondent A also reported increased resilience but relates that to his future career orientation. He had already planned to change jobs but gave the impression to value social interaction. He mentioned this as the reason for the downturn after the dismantling was communicated, but he could quickly recover, although his feeling of 'being stuck' returned. During the second point of contact, all three respondents stated that the level of individual resilience did not change when comparing the six months timeframe after the initial interview. They related this mainly to the ongoing insecurity about the decision, which creates a situation where the respondents feel the need to hold on.

Regarding IWB, the three respondents reported a nearly similar or only slightly changed level compared to before the dismantling was communicated. The reasons for this differ: Respondent A mentioned the state of the decision which influences the support of stakeholders, whereas respondent B explained the trade-off of passion and purpose and the state of the decision, and respondent C was determined to keep supporting the company. In the second point of contact, the three respondents described a changed level of innovative work behavior but related this to the new adverse situation in terms of the COVID19 crisis. Due to the lockdown restrictions, employees were required to work from home, which has differing impacts: Respondent A and C described their IWB as less due to the changed way of working, whereas respondent B felt like the new situation had given her innovativeness a boost to deal with the problematics of the progressing situation. Nevertheless, all respondents saw no change in their IWB with regards to the potential dismantling.

All three respondents of the first group saw a relationship between resilience and IWB. An interesting result of especially respondent A and B is that they saw their character as creating the relationship between resilience and IWB: They had similar views about the need to be resilient to be innovative, emphasizing that the recovery itself requires to be innovative and the mistakes and step backs in innovative processes pose a need for resilient behavior. Respondent C acknowledged that her need to stay innovative, which is based on the wish to further support the company, definitely requires resilience to mitigate the burdening effects of stress and tiredness. During the second point of contact, the three respondents acknowledged the association of the two behaviors, but also saw difficulties of work with the influence of the Coronavirus. Whereas respondent A and B agreed that the difficult situations needed problem-solving as well as strength to deal with the situation in congruence with their earlier statements, respondent C saw the Corona situation as also contributing positive sides: She stated that "if you don't feel resilient, you won't come up with any innovative ideas" (12:14). The "certain amount of peace of mind to make your mind work that way" (12:18), which she saw as relative calmness created by the Coronavirus, contributes to keeping the balance between resilience and innovative work behavior.

The second group, as shown in table 12 as respondents D, E and F, saw no change or a diminishing variation in their resilience in times of adversity and reports decreased innovative work behavior. As well as the first group, they saw resilience and innovative work behavior as related concepts but differ in their underlying reasons.

Concerning their individual resilience levels, respondents D and E stated that they did not see a change in their resilient behavior. Both relate this to the commitment to the company and their future career orientation. In contrast to the first group, which showed their clear commitment to the company and its purpose, especially respondents D and E showed an opposing view. With a focus on the future career orientation, both respondents did not see their future in the company anyway, independent from the adversity.

In the case of respondent E, this is for example based on the change of contract, which resulted in her "investing in [her] career options" (8:20). Although respondent F belonged to this group as well, the resilience behavior was slightly different: Despite the statement in the interview that the adversity did not affect him, the timeline method led to the depiction of his resilience behavior as increasing slowly until the respondent continuously asked about the effort's ultimate use. In the second point of contact, for which only respondent D and F were available in this group, both respondents described an immensely changed situation: Both were laid off

and need to leave the company in summer 2020. Their changes in individual resilience were described differently. Respondent D reported himself as independent from the situation as congruent with his first statements, whereas respondent F saw himself in a “second resilience trap” (15:17).

| Table 12: | **Res → Res** | **IWB → IWB** | **Relationship Res & IWB** | **Underlying factors** | |
|---|---|---|---|---|---|
| Respondent A | **Resilience increased**<br>Limited effect of adversity<br>Effect through social interaction<br>Fast recovery, feeling of 'being stuck' returned | **IWB decreased, then increased again**<br>Feeling of 'kicking the brakes' | **Related**<br>Recovery requires working around obstacles | R | Future career orientation<br>Social interaction<br>Passion & purpose |
| | | | | IWB | State of the decision influences lack of support of stakeholders |
| | | | | R&IWB | Character<br>Commitment to company |
| Respondent B | **Resilience increased**<br>Fast recovery<br>No effect on freedom and independence of work<br>Confidence in a way out and fight to continue | **IWB changes in phases**<br>Capacity to be innovative as 'switch on and switch off'<br>Need for IWB still present | **Related**<br>Struggle to be innovative requires resilience to get back up<br>Being resilient helps to continue if mindset stays in one place | R | Management structure<br>Passion & purpose<br>State of the decision |
| | | | | IWB | Future career orientation<br>Personal development |
| | | | | R&IWB | Character |
| Respondent C | **Resilience increased**<br>Fast recovery<br>Fight to continue<br>BUT: stress & tiredness | **No change in IWB**<br>Focus on purpose and existing operations | **Related**<br>To keep being innovative, the level of resilience increases (mitigating the burdening effects of stress and tiredness) | R | Commitment to company<br>State of the decision<br>Passion & purpose |
| | | | | IWB | Commitment to company<br>Passion & purpose |
| | | | | R&IWB | Commitment to company<br>Passion & purpose |
| Respondent D | **No change** | **IWB decreased**<br>Long implementation and confirmation<br>No use of ideas after adversity | **Related**<br>Need to take risks and initiative, need to learn from mistakes relates to recovering from failure | R | Future career orientation<br>Commitment to company |
| | | | | IWB | Company's culture<br>Later use of ideas |
| | | | | R&IWB | Character<br>Company's culture |
| Respondent E | **No change**<br>Contract changed reasons for resilience | **IWB decreased**<br>No visible change, so IWB deflates | **Related**<br>Necessity to deal with the problems and acknowledge the challenge is part of being innovative | R | Commitment to company<br>Future career orientation |
| | | | | IWB | Later use of ideas<br>Company's culture |
| | | | | R&IWB | Character |
| Respondent F | **Resilience increased, then flattened out**<br>Recovery of the adversity in a positive way | **IWB decreased**<br>No relation to adversity | **Related**, two-sided<br>Stress can make you innovative or locked-in<br>Different types of people | R | Passion & purpose |
| | | | | IWB | Company's strategy/culture |
| | | | | R&IWB | Commitment to company |

The level of innovative work behavior is seen as decreasing in the case of all three respondents in the light of the possible dismantling. All three respondents saw the reason for this in the long time frame of implementation and a lack of confirmation and feedback for new ideas and continuously wondered about the use of ideas after the adversity, which made the innovation efforts useless until further decisions are known about the company's future. This is not only related to the usefulness as influenced by the adversity, but also to the company's culture. Not appreciating change and averting any new processes stopped innovations already before the communication of the adversity and might also be preceding reasons for that, as respondent D and F hypothesized: the lack of innovative drive to keep the company surviving could ultimately be the reason that the decision of a possible dismantling is now faced. The difference to six months later is further going into that direction: Both respondents did not see the use of contributing their ideas anymore and reported their IWB as further decreasing with regards to the employment in the case company. Respondent D already explained that his innovative efforts are now directed towards new projects.

Regarding the connection of the two concepts, the three respondents of the second group saw a relation, as well as the first group did. Respondent D stated that from a profit-driven perspective, there is always the need to take risks and initiative as well as to learn from mistakes, which is inevitably connected with recovering from failure. This statement also coins respondent E's thoughts, mentioning that part of being innovative is the necessity to deal with the problem and acknowledge the challenge. Both respondents saw the relationship as based on the character and the way of dealing with problems. Respondent F saw a two-sided relationship between the two concepts: He stated that stress can make you innovative, but also locked-in, depending on the type of person. A certain amount of stress, as faced in any adversity, can make you come up with good ideas to escape the situation, but it can also restrict the innovation drive. Six months after the initial interview, both respondents still supported the association of the two behaviors. Respondent D further underlined his arguments from the first interview, whereas respondent F added to the personal perspective: He claimed that the personal characteristics as well as experiences also impact both behaviors and described that he sees a connection beyond the work environment. He also distinguished between the level of individual resilience – regarding which he stated that he has a "kind of fighting spirit" (15:19) not specifically focused on the work environment – and the innovative work behavior, for which his motivation has decreased in his job. With regard to the different adverse situation, the Coronavirus, both respondents in this group saw Corona as not having such an impact on the company as the potential dismantling. Respondent D reported that the company is already in a phase where the

old is dissolved and new frameworks are developed. Respondent F saw the global character of the Coronavirus as less affecting than the specific situation of the uncertainty surrounding the potential dismantling. As both respondents stated their termination of contract, the potential dismantling therefore had a larger impact on their behavior as the Coronavirus did. The impact of the decision therefore strengthens their arguments already made in December.

Ultimately, both groups show that the concepts are very personal and that everyone deals with resilience as well as innovative work behavior differently. Also, the understanding, especially of individual resilient behavior, is different: Some respondents focus on the quick recovery from the shock and refer to the 'holding on' as resilient behavior, continuously trying to save themselves from the adversity and restrict any environmental shocks. This is further supported by the results of the supplement with data collected six months after the inital interview, which supported the findings as the levels of behavior did not change or changed only slightly because of the impact of the Corona crisis. As opposed to that, others see their resilience in letting loose of the consequences and cutting themselves off of any negative impact, focusing on their own future instead of the company's future. This can be seen in the second group, which is also reinforced by the results of the second meetings: Both participants here faced a termination of contracts, which also contributed to their behaviors. This means the concept of resilience is very personal and there are many ways of being resilient. As a consequence of the statistical analysis, this might mean that no change in the level of resilience might be proof for the level of resilience itself: If nothing changes, the individual is resilient towards the adversity, making the measurement of the concept increasingly complex. Also, when the underlying situation changes, the level of resilience might stay the same. The behavior within different situations can vary and different behaviors are perceived.

Although the interviewees had different views regarding the underlying factors, some similarities can be found. For instance, the state of the decision, the passion and purpose towards the companies' task field, commitment to the company and the future career orientation can be found as largely impacting the respondents' views of the concepts.

What is interesting to see is also that resilience can be perceived in different ways: On the one hand, the participants see it as grounded in their characteristics and personality, which goes in line with literature with the concept resilience as a trait. On the other hand, especially resilience changes within different situations, contributing to the view of resilience as a state, as we will address further in the discussion.

So, what do we take away from the qualitative supplement of this study? The interviews show different perspectives on the concepts and emphasize the personality and character behind the change. Also, the emotional side of the adversity and its impact on resilience and innovative work behavior is underlined. The recap with the respondents six months after the initial interview brought additional insights into the future and mainly reinforced the results found in the first round of interviews.

# 5. Discussion

## 5.1 Integration & interpretation

Following the suggestion of Steinmetz-Wood, Pluye, and Ross (2019) concerning an integration strategy in mixed methods research, this section focuses on the identification of agreements and complementing arguments in the results, but also on finding discrepancies and additional perspectives to the arguments made so far as well as connections to literature.

The primary aim of the study was to provide empirical research regarding the relationship of individual resilience and innovative work behavior in light of an adversity, while also analyzing the difference of resilience as well as IWB before and after the adversity.

### *5.1.1 Hypothesis 1: Individual resilience before & after the adversity*

Regarding the first hypothesis, our quantitative results did not find a significant difference between the level of individual resilience before and after the adversity. In the qualitative results, more distinguishable results become visible: One group of respondents, divided according to the qualitative results, feels like their resilience increased, whereas the other group felt like maintaining their pre-adversity resilience levels. In line with previous research, e.g. King et al. (2015), these individual changes can be traced back to the shapeable and dynamic nature of resilience as facilitated by disruption and rehabilitation, defined as resilience as a state. This is also supported by the findings six months after the initial interview: Due to the differing situations and underlying reasons, the behavior is also developing in varying ways, as can be seen when comparing the two groups. The different individuals face different underlying dimensions and individually varying concepts and influences (Block & Kremen, 1996; Moenkemeyer et al., 2012; Tugade & Fredrickson, 2004), which the quantitative scale might lack to perceive. Additionally, the underlying reasons for the maintenance or growth in resilience are neglected, which can be found either in the individual, but also in the environmental characteristics. For example, one respondent explained that social interaction with colleagues helped to recover from problematic situations, whereas the insecurity of the

decision further complicates the reaction. This is in line with the findings of Richter et al. (2019), who report that the interaction between resilience and the adversity depends on the situation and differs largely between individuals.

When looking back at the distinction of resilience as a trait and state, we can reflect here that we see support for the conceptualization of resilience as a state, as supported by Näswall et al. (2015, 2019), but also for resilience as a trait, as supported by Luthans (2002) and Caniels and Baaten (2019). This calls for the differentiation of the concepts: Although we see no significant difference when comparing the level of resilience pre-adversity to the level post-adversity, which could be a sign for a robust trait that signals the level of resilience, we find in our interviews – both the initial interview as well as the follow-up six months later - that the respondents do see their resilience as changing, emphasizing the state-like characteristics of resilience. This goes in line with research of Caniëls, Hatak, Kuijpers, and de Weerd-Nederhof (2020a), who report that employees who are resilient according to the trait conceptualization can take advantage of the resources of their environment or are able to draw benefits from social interactions, improving the situation for themselves. This means that they are utilizing their environment and their individual characteristics to deal with the situation, which in turn creates a learning environment and facilitates continuous improvement. We conclude for the differentiation of trait- and state-like resilience: Although resilience is also based in the characteristics, as can be seen in the qualitative interviews and their perception of their character as a reason for reactions, the environmental and external factors also take a heavy impact on their reaction. This is grounded in the state-like resilience, which faces dynamic changes in different situations.

Moreover, as the waves were collected in two points of time, the process of resilience is neglected in the quantitative part. For instance, as three interviewees reported, they perceived a slight bump in their resilience after the adversity was communicated and reported that they recovered quickly from that – a small change that might have personally impacted them a lot, but cannot be seen by the quantitative measures. Rook et al. (2018) found this in their study concerning resilient individuals as well: They report that most symptoms of distress do not show more than little disruptions after situations of adversity. The same authors also argue that the benchmark of individual resilience is depicted in the maintenance or increase of functioning capabilities, as also suggested by Eshel et al. (2017). This means that an insignificant difference as reported by the quantitative method as well as the consistent or perceived as slightly increasing level of resilience is congruent with earlier research.

However, as most authors argue, resilience can be defined as "positive adaptation within the context of significant adversity" (Luthar, Cicchetti, & Becker, 2000, p.543) and the positive adaptation is a necessary symptom of resilience (Goldschmidt et al., 2019; Ferguson et al., 2013). What literature does not find consensus in is what positive adaptation means: does it mean to persist and keep the level of behavior as before, positively maintaining the same level? Or does it rather focus on only increasing in resistance? Maintaining the same level of resilience can also mean that the individual is highly resilient – after all, the level of resilience would resist the adverse situation and stay at the same level. But also, learning from the situation and increasing in resilience can also be meaningful to resilience. This can also be seen in the follow-up information that the respondents gave: Group one maintained their resilience, whereas group two differentiates between the contexts of job and general resilience. This goes in line with our earlier found characteristics of resilience as supported by the literature review.

As can be seen, there is more to the concept of individual resilience as only a 'high' or 'low' level and the concept entails many more perspectives than anticipated by most authors so far. We conclude – following the resilience characteristics supported by the literature review (Impact of adversity, dynamic process, successful adaptation i.e. maintenance or increase, balance of positive and negative factors, context of adversity and context of individual) – that we see support for the characteristics, but emphasize the dynamic process and the contextual situations of the individual as impacts on the reactions to adversity.

### *5.1.2 Hypothesis 2: Innovative work behavior before & after the adversity*

To recap for the second hypothesis: According to literature, we tested the hypothesis whether there was a significant difference between the level of innovative work behavior before and after the adversity. The paired-sample t-test did not find a statistically significant difference, although there was a small decrease recognizable in comparing the means. In the qualitative supplement, the interviewees reported again – comparable to the difference in individual resilience – varying results. Group one reports a nearly similar or only very slightly changed level as congruent with the quantitative findings. According to Bendickson et al. (2019), recovery efforts, stakeholder activities and emerging opportunities coin the phase after adversity, maintaining the level of innovative work behavior as part of the recovery process. Fitting to the qualitative results and the underlying reasons the participants mentioned, the innovative capabilities have to continue to recover from a crisis. For instance, the state of the decision, the sense of passion and purpose and the need to support the company help to maintain the level of innovative work behavior. Especially respondent C reports a heavy emotional

commitment to the company and states that the continuance of innovativeness is burdening, but that determination helps to overcome the crisis. Complementing that, respondent B reports that she faces "moments of resistance", where she describes her innovative work behavior as having a switch-off button, which can be impacted by the determination to overcome the adversity. Also, Bastian et al. (2018) found in their study of social interactions and creativity in adversity that the sharing of adverse experience increases the support between members. Reaching the same conclusion as Edson (2012) and Walter et al. (2011), social interaction and passion as well as a sense of purpose contribute to the maintenance of the level of innovative work behavior. Interesting to see is also the difference to respondents' statements about innovative work behavior in the follow-up: Especially the respondents from group one felt that the Corona virus situation has a large impact on the way of working, which also influences IWB.

As opposed to the first group, the second group of respondents sees their innovative work behavior as decreasing, when faced by adversity. They report a long-time frame of idea implementation, a lack of feedback and the question of the use after the adversity. Generally, this is seen to be connected to the company's culture. The respondents state that change is not appreciated, and any new processes are limited already before the adversity was communicated. The lack of innovative drive to keep the company surviving is now the reason that the respondents are detaching from further development and seeing the contribution of innovative ideas as useless. Branicki et al. (2018) argue that innovation and creativity focus individually on the adversity, which draws a scarcity of resources with it. This means that in order to overcome the challenge, innovativeness might consist or even increase – but, as for instance Malik et al. (2019) report, various perspectives play a role in the change of capabilities. Temporal, structural and contextual processes heavily influence the impact of the adversity (Malik et al., 2019) and in the case of the Dutch social company, the culture is seen as restricting the innovative work behavior independently from the adversity. For the respondents of this group, the innovative work behavior also changed in the follow-up when comparing it to six months earlier, which also supports the statement of Malik et al. (2019) concerning the temporal, structural and contextual processes. For instance, respondent D had already new projects in mind where his efforts are concentrated on, which is a different contextual situation than respondent F faces, who reported a diminishing level of innovative work behavior in the context of the company he was laid off of.

To conclude for this hypothesis: We can agree that there are again many underlying factors that influence the difference of innovative work behavior and highlight especially the commitment to the company but also the company's culture as factors. Although the quantitative analysis

does not see a statistically significant difference before and after the adversity, which is partly reflected by the qualitative analysis, the qualitative supplement adds additional perspectives. On the one hand, the commitment to the company enables employees to hold on and be innovative to overcome the challenge – which is also a sign of the connection to resilience as will be addressed in the next part. On the other hand, preceding circumstances, like the culture or the strategic direction of the company, might impact the reaction on the adversity negatively, ultimately having an influence on the commitment to the company. Additionally, different people react differently to the circumstances: as respondent F stated, the reaction is two-faced. Stress might support innovativeness, but it can also restrict the drive, building a context-dependent relation to resilience as addressed in the next part. Further, the contextual circumstances play a role in the development of innovative work behavior.

### *5.1.3 Hypothesis 3: Relationship of individual resilience and IWB*

The last hypothesis investigates the relationship between individual resilience and innovative work behavior. In the quantitative analysis, a statistically significant correlation between IWB and resilience was found before and after the adversity by Pearson's product-moment correlation. These points are further enhanced by the mixed effects model, which takes the relationship over time into account. Although the random effect was ultimately excluded due to model fit, time does not have a statistically significant impact on the relationship of IWB and resilience.

Regarding the complementary concepts and the causality of behaviors, as both directions were argued in literature and only an experimental treatment study can reveal causality, we tested both directions – IWB impacting resilience and the other way around – of which both gave nearly similar results. Both directions were tested to detect any underlying directions of the association. The variance between the times is not seen as statistically significant, meaning that the relationship is independently seen from the adversity. This is partly supported by the findings of the quantitative supplement: Analysis of Dutch employee work behavior data revealed that resilience as a state – which is measured in our main analysis as well –has a significant effect on IWB, but its interaction with the adversity proxies does not. The same goes for the relationship in the other direction: IWB does also statistically significantly predict resilience as a state, but the interaction effects do not show a significant impact of the adversity interaction.

However, IWB impacting resilience gave the better model fit, which is why the version was preferred. In the quantitative supplement, both IWB predicting resilience as a state and

resilience as a state predicting IWB gave a nearly similar model fit with 35.6% compared to 37.9% of variance. Thinking about the connection of the two terms, both versions seem to be logical: if an employee is innovative, meaning that he can come up with one-of-a-kind well-fitting solutions to original situations and problems, he might also be more likely to recover from adverse situations, as the need to deal with problems contributes to recovery. The other way around, if an employee is especially resilient mentally, meaning that he can be very optimistic, adapt well to new situations and is eager to fight through, he might be more likely to be innovative and find creative solutions to get out of the crisis. This poses the question of causality of the behaviors – what comes first, resilience or innovative work behavior? Regardless of the challenge, there needs to be a reaction and the problem is potentially solved with creativity and innovativeness.

In the qualitative supplement and the follow-up, all respondents agreed that they see a relationship between IWB and resilience. Although they have slightly differing understandings of the concept, they see the concepts as deeply connected: for example, respondent A and E emphasize the need to solve problems with new approaches while having an objective in mind, growing with the problems and seeking challenges. Respondent B underlines the need to bounce back and explains that without the capacity to be resilient towards problematic situations, innovativeness is not possible. Respondent C rather takes the perspective that in order to keep being innovative, the level of resilience increases, fighting the burdening effects of stress. Resilience is an essential part of growth and development and a personal characteristic, as seen by respondents D and F. The reported behavior is associated with resilient employees – especially adaptive behavior, resource utilization and development are stressed in the literature (for instance: Vera et al., 2017). Interesting to see here is that the two groups that reported differing results in earlier hypothesis now find congruence in the relationship of IWB and resilience. In line with research, most researchers regard innovativeness in adverse times as connected to resilience or as part of resilience. For example, De Clerq and Pereira (2019) have found a positive relationship between employee resilience and disruptive creative behavior with adverse working conditions as mediator. This goes in line with Moenkemeyer et al. (2012), who argue that the context-specific conceptualization of individual resilience influences innovative work behavior. Also, Caniëls et al. (2020a) emphasize the organizational learning climate as crucial for the facilitation of resilient behaviour at work and differentiate between trait-like and state-like resilience in this regard. As the quantitative supplement addresses both conceptualizations, it contributes to this differentiation with regard to our third hypothesis: We found out that the relationship of resilience as a state and innovative work behaviour is not

moderated by the adversity proxies. Both directions have nearly the same model fit, signifying a substantial amount of covariation. This fits to the results of our main qualitative analysis. Interesting to see in comparison to that is the relationship of resilience as a trait and innovative work behaviour. In both directions, both interaction terms are significant. This might point further to the learning capabilities as mentioned earlier: Resilience as a state is dynamic and depends on the situations the individuals face themselves in. Accordingly, we might see that the variables in itself change, but they change independently from the adversity, meaning that they learn and improve their skills to deal with the situation without further impact. Additionally, resilience as a trait is more robust and relates to personality characteristics. This fixed feature and its relationship to innovative work behavior might be moderated by the adversity, which is a finding in our quantitative supplement.

Addressing the variance of time, which is not statistically significant in the quantitative analysis, was difficult for respondents in the interviews. They argued for the connection between the concepts but did not specifically state if and how the relationship changed in light of the adversity. According to the linear mixed model, the relationship is not significantly modified by the adversity, which partly diverges from literature. De Clercq and Pereira (2019) as well as Cameron et al. (2018) reported that the relationship between the two concepts is altered by adverse situations. In the study of Cameron et al. (2018), the different reactions were also traced back to individual characteristics and how that impacts in resilience as an emergent and dynamic state. In the interviews, respondent F made an interesting statement regarding the individual characteristics, which takes up the perspectives lacking in the quantitative parts: He explained that he sees the relationship between the level of individual resilience and IWB as heavily influenced by characteristics. He explains that the relationship is two-sided: On the one hand, the people who are very committed to the company, have a strong feeling of passion and purpose and are loyal to their employer are reacting more heavily to the adversity. They are fighting for the company and need to keep up the innovative work behavior. In turn, this impacts the level of resilience, as the situation is emotionally tiring and brings large levels of stress. On the other hand, are people who are more focused on personal development. Although they are also committed to the purpose of helping people, they see open opportunities and additional ways of development without their current employer and are more flexible. Ultimately, the state of the decision is also influencing the reactions of the respondents, as the dismantling is not fully decided at the time the research was conducted. This again takes up the issue of differentiation: Trait-like resilience and its impact or relationship to state-like resilience is an issue to discover. The two-sided relationship as described earlier can take up part of this

differentiation issue: For instance, in terms of the state resilience, the commitment to the company might support the temporary increase of state resilience, but the emotionally tiring and stressful situation could be signals for a lower level of trait-like resilience.

Further, the unclarity of order of the behaviors, which resulted in the fitting of different models, could also be seen in the qualitative part: The respondents did not see a clear direction and line of causality between the behaviors. The same can be seen in literature: for instance, Marwa and Milner (2013) argue that soft organizations investing in creativity also build up resilient behavior. Reason for this might be that different scholars as well as the interviewed individuals or respondents in the questionnaire have different concepts of resilience and innovative work behavior: In some instances, innovativeness can be seen as an organizational setting and individual resilience as a successor of that (Marwa and Milner, 2013), whereas in other instances, organizational resilience contributes to innovation within turbulent environments (Richtner and Lofsten, 2014). Euchner (2019) argues that innovation facilitates disruption, which in turn is dealt with by resilient capabilities. In some instances, the two concepts are even seen as closely intertwined, for example by Todt et al (2018), Oeij et al. (2016, 2017, 2018) and Moenkemeyer et al. (2012). These authors focus on concepts like innovator resilience potential, innovation resilience behavior or mindful infrastructure.

### *5.1.4 The type of adversity: COVID-19 excursus*

While the contextual setting of the research and the adversity in form of the dismantling were a substantial part of the research from beginning on, we faced another adversity on which we would like to reflect shortly: the Corona crisis.

Contrasting both adversities, they seem to vary widely: Whereas the dismantling impacts only one company and the final outcome is not clear at the time of writing this paper, the Corona crisis influences the whole country – if not the whole world – and its impact has stopped businesses from operating in a normal manner.

The respondents in our research, when asked for the implications of the Corona crisis on their work, on their level of individual resilience and innovative work behavior, had also varying opinions. For example, respondent A continued to see a link between the behaviors, also he related both situations to an unfortunate way of working and saw the social insecurity as one of the main impacts on his resilience, despite his continued optimistic feelings. Respondent B felt the need to be more innovative and draw some positive things out of the calmness of the situation, such as a peaceful state of mind or the concentration to return to the most important actions. Respondent C focused on a more flexible and more independent way of working, but

did not see a difference in her resilience or IWB: respondent D as well as F emphasized that the dismantling has more impact. A quote of respondent F displays the perceptions of the respondents well: “Corona leads to a survival mode that looks like a return to normal. There’s a greater degree of certainty in this and a larger scale. We’re all in this. As far as dismantling goes, it’s not clear what that’s going to be . Both in terms of work and job retention and in terms of continuity in the long term.” (15:22).

This shows that the type of adversity – or even the overlap of types of adversities might play a large role in the perceptions of individual resilience and IWB. The dismantling was not impacting the personal lives of the employees yet, meaning that the participants handled the situation well. See for example group 1, which is committed to the company and handles out of passion, as they still see hope for the company. In contrast to that, group 2 has already had an personal impact, meaning that they were fired from their job. This changes the type of adversity and is also likely to influence the level of individual resilience and IWB.

In the case of the Corona crisis, the respondents reported that they are relatively independent from the crisis’ impact or even felt the ability to work better. This could for example be traced back to the way the Netherlands are handling the crisis, which has an effect on the confidence and feeling of security of people. Additionally, referring to the learning capabilities and the ‘ability to bounce back’ as addressed in the theory framework earlier, it could be that the difficult situation has already impacted the resilience. This would mean that the participants are able to be more resourceful and creative when another adversity strikes and points to a fast circle of learning as well as a quick adaption to the situation – also a characteristic of a resilient person.

Finally, distinguishing between resilience as a trait and resilience as a state could also deliver value when looking at different adversities: In our robustness check, we found that resilience as a trait does have an interaction effect with adversity, meaning that it is impacted by different types of adversity. This goes in line with the preliminary findings of de Weerd-Nederhof (2020), who currently tests that Corona worry has a negative relationship to resilience as a trait, which in turn impacts IWB negatively – meaning that adversities, such as the Corona crisis, can also alter and re-shape personality characteristics.

## 5.2 Contributions & limitations

### *5.2.1 Practical contributions*

In increasingly volatile environments, the resilience to unexpected problems and adversities becomes more and more important (Näswall et al., 2015) and builds a strategically important capacity for organizational success (Bardoel et al., 2014). In line with these results, our findings help to improve the knowledge about the concepts which are continuously growing in importance.

Our research can contribute to finding out what activities can help employees deal with the effects of adverse events. To study necessary actions, the first step is to fully understand the concepts and how employees might react to adversity. Study 1 as well as study 2 therefore contribute to building resilience research and also addresses the connection to innovative work behavior, which poses another trait to deal with problematic and adverse situations, which often come spontaneous and unexpected. The findings can be used to investigate what can be done to help individuals to deal with adversity and how can employees be managed, not only before but also after a disaster has taken place. Although the recovery and maintenance of organizational capabilities also play a role, the recovery of individual skills and psychological influence cannot be neglected.

Study 1 shows that even though quantitative results might not indicate a significant change in the concepts, the underlying thoughts and perceptions of the employees as addressed in study 2 can signify negative reactions. Following an adversity, employees might not be as able to perform in their roles as before and can potentially be more focused on self-protection, leading to absent minds and decreased commitment at adverse times – often the times that organizations need their employees the most.

Especially interesting for practical contributions are therefore the underlying concepts and factors that influence the concepts, as we emphasized in study 2. For example, the organizational climate or culture might foster resilient and innovative work behavior, which in turn can have positive implications for the organization when times of need are imminent. Also, investing in activities that build up resistance – for example, promoting social interaction, strengthening the commitment and identification with the company or caring that employee initiatives are valued – can have a long-going impact on resilience as well as innovative work behavior. Characteristics and their influence on resilience – which can also be differentiated as trait-like resilience – can also contribute to further understanding of the workforce. Especially for HR, knowing the characteristics and how to optimally support the employee in building

resilience and strengthening innovative work behavior with individually adapted actions can contribute to an extensive understanding and support of employees. Also, finding potential ways to increase commitment to the company requires a thorough understanding of why the employees are committed in the first place, which can later be used to investigate actions to help employees to be more resilient as well as enhance the innovative work behavior.

### *5.2.2 Theoretical contributions*

Especially individual resilience is widely cross-sectional among psychological and socioecological scholars but faces a lack of generalizable theories in organization research (van der Vegt et al., 2015). While previous researchers so far mostly contributed to the field in conceptual articles or case studies, our study contributes to the field by addressing the research gap as identified by Näswall et al. (2019). King et al. (2015) also call for practical evidence, further supported by Britt et al. (2016), who call for research exploring how adversity influences resilience in the process of time. Van der Vegt et al. (2015) theorize that adverse situations influence work behavior – amongst others innovative work behavior (Moenkemeyer et al., 2012) – and mention the possibility to research the effects in experimental or field settings while emphasizing the difficulty to introduce realistic crises. We address this research gap by investigating in a mixed-methods study how individual resilience and innovative work behavior change in light of an adversity and how the two concepts are related.

Further, our research contributes to clarifying how individual resilience and innovative work behavior change in light of an adversity. We did not find evidence for a significant difference when comparing the quantitative data before and after the crisis was announced (Study 1) but can substantially contribute to existing research by the second study. Underlying factors and individually varying concepts and influences were found to play an overarching role in the concepts, which supports the findings of Richter et al. (2019), Block & Kremen (1996) and Moenkemeyer et al. (2012), amongst others. In this way, we start to pave the way for further research in this area.

We also contribute to existing research by examining the relationship between the two concepts in light of adversity in our study 1. We find that the pre- or post-adversity measurement does not play a significant role in our quantitative analysis. However, we see that individual resilience and innovative work behavior are related, supporting the research of De Clerq and Pereira (2019) as well as Moenkemeyer et al. (2012). This finding contributes to the existing literature by finding practical evidence for the concepts' association, but also calls for additional research in this area as explained later.

Additionally, our approach confirms the multi-level perspective of individual resilience and the individual reactions of employees, adding to the research of Stajkovic and Luthans (1998). We find in our second study that many underlying factors and environmental circumstances contribute to the concepts. For example, social interaction can have an influence on how an individual's level of resilience changes when confronted with adversity (Richter et al., 2019), but also the company's culture and sense for purpose (Edson, 2012) can influence the level of innovative work behavior, as respondents agreed on. These findings build on existing literature and can potentially contribute to establishing a framework for resilience. Additionally, they point out inconsistencies in research so far, which also underlines the difficulty of measuring the concept: There is more to the concept of resilience than 'high' or 'low' levels and positive adaptation as part of the definition of many scholars (Luthar et al., 2000; Goldschmidt et al., 2019; Ferguson et al., 2013) might not be the most remarking indicator for resilience, leaving room for further research.

As the next contribution, our paper emphasizes the process with its methodology: Using the two studies in a mixed-method design, this research can emphasize the process of change, which results in adverse situations. The unique research design resembling a repeated measures study adds a new perspective on resilience research with the adversity as a contextual effect and directly connects it to innovative work behavior. This underlines the value of mixed methods research in social sciences. We would further like to emphasize the value added by the second study, the qualitative supplement. Getting the perceptions of interviewees on this very personal matter has helped to understand the concepts and underlying factors. Also, the timeline mapping method by Kolar et al. (2015) brought further value to the interviews, as it supported the sensitive addressing of topics and provides the visualization of the narrative. We also noticed in the interviews and when comparing the drawn timelines, the differences in handling should be appreciated. Some interviewees might draw a complete timeline, whereas others choose to not use the offered method. The flexibility in handling helps the participants to remember and to display their thoughts. In hindsight, we see this method as adding immense value to our research, as it helped participants to think about the progress of change and display how they perceived their levels of resilience and innovative work behaviour.

### *5.2.3 Limitations*

Our research also faces some limitations, requiring explanation and providing potential opportunities for future research to further get in the field of individual resilience.

First, as the data was exclusively gathered in a case study setting in a Dutch social company known for its innovative approaches, the generalizability is limited to companies in a similar setting. For example, companies which are dependent from other institutions and require and base their performance on innovating, by means of the generation and sale of new services, are potentially in a similar setting and could be compared. Nevertheless, the adversity that the Dutch social company faces is very specific. Despite the limited generalizability, our findings offer insights into the relationship of individual resilience and IWB in adversity and add to the limited empirical research on this topic so far.

The quantitative data was gathered independently from this research in a survey on employee well-being (Study 1), while the qualitative data was collected for the purpose of this research (Study 2). Whereas the independence of data without previous knowledge of the impending decision regarding the potential dismantling is a strength of the research, the point of time of interviews is suboptimal, as there were conducted approximately half a year after the potential change has been communicated. On the one hand, this may have affected the respondents' ability to remember, but on the other hand, it allows a far-reaching view of the process of change.

Further, the interdependencies between the employees who took part in the questionnaire and who were interviewed are unknown, which poses restrictions on the sample in study 2. It could be that study 2 focuses on a group that thinks quite similar because the interviewees volunteered and there was thus no influence on the sample. However, as the results generally show two groups with different reactions and the respondents also address this two-sided reaction, we conclude that the sample is representative of the questions posed.

The state of the decision has to be considered as well. As the possible dismantling was announced as one option to the participants and the decision was taking a long time, this might have affected individual resilience and innovative work behavior as well. In March 2020, so approximately 10 months after the potential dismantling was announced, an outline was presented to guide the future of the company. Accordingly, as the interviews were conducted in December 2019, the decision was yet to be taken. This also relates to the type of adversity: Different types of adversities might cause different reactions. For example, an adverse situation at work might have varying emotions, reactions and underlying factors when compared to sickness in the personal context or also the current World pandemic COVID-19.

Regarding the study design of study 2, further interview questions at later time points could have contributed further valuable insights into the study. Interviews before the adversity was

communicated would have been ideal to find an initial point of reference and compare the perceptions of resilience and innovative work behavior. But, because the adverse situation is almost impossible to represent realistically in an experimental manner, the interviews had to focus on a post-evaluation on the concepts.

Finally, the causal nature of the two behaviors remains unclear. The association is proven based on the quantitative and qualitative results, but if there is causality of the behaviors cannot be analyzed based on the setting. Again, this would have been the case in experimental research with baseline and treatment groups, but due to the realistic adversity this is not possible. Because a broad range of literature does also not give clarity in this matter, we assumed to use the best fitting model for this research. Forerider in this regard is a study by Caniëls, Hatak, Kuijpers, and de Weerd-Nederhof (2020b), using cross-lagged analysis to address causality of trait resilience and idea generation.

### *5.2.4 Recommendations for future research*

Despite the limitations as addressed in the earlier section, our research brings further recommendations for future research to light.

As the concept of resilience and its connection to innovative work behavior, especially in light of adversity, is lacking empirical research, the field can benefit from further proceedings in this field. As the literature so far has mostly focused on conceptual and solely theoretical papers, practical evidence can contribute a lot to develop an understanding of the concepts.

Especially the unclarity of the concepts can be addressed in later research: What do individuals actually understand under the term resilience? What does it mean for them? What is additional and specific behavior associated with resilience? This is important especially in qualitative studies, as we found that the opinions and thoughts about the concept differ largely.

Moreover, a look into underlying factors of individual resilience and innovative work behavior as well as the relationship can potentially contribute valuable insights. For example, are there certain personality characteristics that make people the most resilient and most innovative? This could give more insights into trait-like resilience based on personality characteristics. In contrast to that, the following questions addresses the state-like resilience: Are there environmental circumstances under which individuals can learn to be more resilient or more innovative? Here, the contextual environment is considered with resilience as a dynamic state depending on the context. Interesting could be also to examine the two-sided relationship of individual resilience and IWB, for example what different factors might impact the reaction to

the adverse situation. Although this topic is very much associated with psychological literature, it can also lead to organizational proceedings, for instance how an organization might foster a culture that better supports resilience.

Further, we would like to recommend the usage of qualitative supplements to quantitative studies in this regard. Qualitative methods like narrative research or diary research could potentially contribute value to getting insights into the changing processes, as it focuses on the underlying factors and dynamically changing perceptions. For instance, Amabile and Kramer (2011) focus on the progress of inner work life and use diary research as a method, which increases traceability and helps to analyze changes.

Proceeding to a more specific understanding of resilience and its connection to IWB, these topics are already interesting for organizational research and can become even more so with the right research direction. For instance: Can resilience be learned? Can it even be taught? Do you perform better when you are resilient to adverse situations? Questions like these are bound to become indispensable in the increasingly complex business environment.

# 6. Conclusion

This research aimed to investigate the relationship between individual resilience and innovative work behavior in light of an adversity. In particular, we examined the difference between the level of individual resilience before and after the adversity, the level of innovative work behavior before and after the adversity and the relationship between the level of individual resilience and innovative work behavior.

Based on a mixed-methods approach consisting out of the first study, a quantitative component with two datasets and the second study, qualitative interviews, we show that the levels of individual resilience and innovative work behavior do not differ significantly when comparing the levels before and after the adversity. We hypothesized based on the literature reviews that resilience would be maintained in resilience, with the quantitative analysis supporting the maintenance of the resilience level. Further, innovative work behavior was expected to increase, but our analysis disproved that. However, the interviews reveal underlying factors, which influence the reaction to the adverse situation heavily. For example, personal characteristics, the attitude towards the organization and context-specific settings like organizational culture can influence how resilient and innovative an individual is and how that is impacted by an adverse situation.

Further, we investigated the relationship between individual resilience and innovative work behavior. There is a significant association between the behaviors, with each explaining a substantial amount of variance in the other. In the relationship between the concepts as well, we recognize that the concepts take many levels and each individual perceives their reaction to the adversity differently – there is an entire continuum of reactions to adverse situations, also depending on the differentiation of trait-like and state-like resilience.

Contributing to a deeper understanding especially about the concept of individual resilience, our study contributes to empirical research with a mixed-methods study. We further emphasize the process of change related to any adversity and call for additional research to build common ground in the topic of resilience. Moving forward in this area does not only mean to make strategic or organizational advances in a business context. It also means achieving a mentally healthy, durable society that is able to face crises without feeling uneasy – or even emerges with the feeling that people have survived well and learned from the situation.

**Appendices are available upon request from p.c.deweerd@utwente.nl.**

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