

Benjamin Rampp
Martin Endreß
Marie Naumann *Editors*

Resilience in Social, Cultural and Political Spheres



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ISBN 978-3-658-15328-1 ISBN 978-3-658-15329-8 (eBook)
<https://doi.org/10.1007/978-3-658-15329-8>

Library of Congress Control Number: 2018965235

Springer VS

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Wiesbaden GmbH part of Springer Nature
The registered company address is: Abraham-Lincoln-Str. 46, 65189 Wiesbaden, Germany

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Introduction: Resilience as a Perspective for the Analysis of Societal Processes

Marie Naumann, Benjamin Rampp and Martin Endreß

During the past decade the term ‘resilience’ experienced, and still experiences, an ongoing growing reception in several disciplines of the social sciences, particularly in sociological research. This research context includes heterogenic approaches on how to conceptually frame resilience in the light of various theoretical foundations. Common to all these approaches is, however, that resilience becomes topical in the context of analysing phenomena and processes of the ‘resistance’ or the ‘resistibility’ of certain (social) units or actors which are perceived as faced with various constellations of disruptive change—be those social, cultural, political, economic, institutional or organisational disruptions which become relevant in terms of a self-perception and/or a foreign perception and which are identified as threats, hazards, dangers, shocks, catastrophes, risks, crisis etc. in empirical perspective. Thereby, the guiding terminological understanding of resilience generally targets the identification of varied potentials of (social) units or actors in certain spheres of action—that is to say resources, dispositions and strategies—which potentially enable or enabled them to encounter a disruptive constellation in the light of existential preservation.

Against this background, the present volume provides a preliminary appraisal of socio-scientific and sociological resilience research by assembling contributions of authors originating from different disciplines of the social sciences, thus,

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fostering an interdisciplinary discussion on the theoretical and analytical potentials as well as the empirical applicability of the concept of resilience. Simultaneously, it provides an updated state of the art of social sciences' and particularly sociological resilience research.

To systematically approach this objective, the volume is structured in three parts: the first part contains four contributions which discuss the potentials and difficulties related to the previous and further admission of resilience in socio-scientific and sociological research from a theoretical perspective, whereas the following two parts respectively assemble empirical analyses of its utilization in the context of various social, cultural and political spheres.

Stefan Böschen (Aachen), *Claudia R. Binder* (Lausanne) and *Andreas Rathgeber* (Augsburg) open up the first part which focuses on "Theoretical Considerations" by pursuing the question of which different theoretical models can be identified with view to the utilization of the concept of resilience in different scientific constructions of resilience and how they differ from one another. Based on the findings of a quantitative empirical survey, the authors argue that four different theoretical models can be observed in regard to the scientific use of the term 'resilience' which, in turn, can be described by two dimensions: firstly, the underlying theoretical conceptualization ('structural' versus 'process-related') and secondly, whether relations to the context are part of conceptual considerations or not ('context-resilience' versus 'self-resilience'). In the following contribution, *Martin Endress* (Trier) continues with a constructivist perspective on resilience. Having the overall goal of the development of a sociologically-viable concept of resilience in mind which current research is still lacking, he discusses the socio-historical constructedness of resilience from a firm sociological point of view which integrates both a social constructivist as well as a sociology of knowledge perspective. His theoretical considerations are guided by four central analytical dimensions, that is to say normative neutrality, temporality, perceptivity and power. Whilst emphasising quite different research-theoretical focuses, both of the above-mentioned contributions respectively make a claim for systematically approaching theoretical considerations on resilience and, thus, provide an updated, grounded basis for the further development of a (sociological) theory of resilience.

Benjamin Ramm (Trier), in turn, places a firm research focus on the question of 'identity'—or speaking more precisely from a social-constructivist sociological perspective: the question of 'identification'—which becomes thematic in course of the nexus between continuity and change as a central, yet essentialistically understood analytical aspect of previous discourses on resilience. By visioning resilience as a non-essentialistic theoretical perspective on non-linear social processes, he discusses this issue by productively comparing analytical potentials of

resilience heuristics on the one hand and figurational approaches to sociology on the other hand which, as he argues, both are, ultimately, linked to the analytical dimensions of scaling as well as relationality. The first part closes with a contribution by *Martin Voss* (Berlin) who analyses resilience through the sociological lens of the theory of symbolic forms and, thereby, discusses basic epistemological problems which underlie the previous scientific utilization of resilience at least in social spheres. Similar to the aforementioned contribution, he argues that theoretical considerations on resilience have to strictly partake in terms of relationality and processuality as central analytical dimensions.

The following second part of the volume includes five empirical contributions which respectively analyse different “Resilience Discourses” and, thus, focus on a rather meta-analytical level. *Michael Meyen* and *Janina Schier* (München) start off with a comparative investigation of the similarities and particularities of the utilization of resilience between different scientific discourses—among them (social) ecology, social geography, (comparative) economics, psychology and management research—and public discourses, that is to say the contexts of corporate communication of company-related health insurance funds, popular research and mass media. Their analysis, thereby, makes use of Foucault’s knowledge-analytical considerations on the topic of discourse analysis as a guiding research perspective and, thus, draws upon his heuristics of different rules of discursive formation.

The other four contributions, in turn, focus on specific societal discourses on resilience. *Gabriela Christmann*, *Heidrose Kilper* and *Oliver Ibert* (Erkner) provide an investigation of central theoretical conceptualisations which underlie the resilience discourse in the social sciences in general and the herewith strongly interwoven German planning sciences’ discourse on resilient cities in particular. Speaking more specifically, they analyse conceptual utilizations of ‘vulnerability’ and ‘resilience’ in the aforementioned discursive contexts with view to their analytical limitations as well as to crucial desiderata and, on this basis, to promising theoretical and analytical extensions from a sociological point of view. *Jonathan Joseph* (Sheffield) comparatively analysis the emergence and utilization of resilience in Anglo-Saxon and German discourses in regard to two material areas of policy making: national infrastructure protection and overseas disaster and humanitarian intervention. He especially discusses if and in how far a neoliberal understanding of resilience—that is the emphasis of individual self-regulation and, thus, limited government intervention—comes into effect in these discourses. *Philippe Bourbeau* (Quebec) and *Caitlin Ryan* (Groningen) continue with an investigation which addresses the International Relations’ discourse on resilience which is currently characterised by the debate on how the concepts of ‘resilience’ and

'resistance' have an analytical connection with each other. Instead of emphasising them in a substantialist-ontological perspective as competitive, mutually exclusive concepts, the authors advocate for a process-relational perspective which draws upon the disregarded mutual assistance of both concepts. The analytical surplus of considering 'resilience' and 'resistance' as complementary concepts is, thereby, empirically illustrated by the exemplary case of the Palestinian national liberation movement. *Julian Reid* (Rovaniemi) closes the volumes' second part with a discussion of the analytical potentials of the concept of the 'image' or 'imagination' for the advancement of a grounded understanding of resilience in social, particularly political spheres. Thereby, the psychological discourse on 'the resilient self' within which this concept is highly prominent marks the starting point of his critical considerations which are decisively based on philosophical approaches.

The third and last part connects six contributions in terms of a compilation of different "Case Studies" on the emergence, utilization and relevance of the term and/or concept of resilience in different societal contexts and, therefore, focuses on a more micro-analytical level. *David Chandler* (London) starts off with a discussion which critically explores in how far hacking can be understood as a mode of resilience in the context of digital policy activism. His considerations, thereby, are analytically strongly connected to the concept of the Anthropocene which is currently of growing interest in International Relations' discourses with view to the research-theoretical challenges it evokes in the context of the study of security. In a thematically similar orientation, *Stefan Kaufmann* (Freiburg) continues with a contribution which concentrates on the career of the concept of resilience in security studies with regard to its creation as well as previous contexts of its utilization. The authors' investigation is, thereby, analytically based on Foucault's genealogical works and argumentatively closes with suggestions concerning development potentials for the further application of the concept of resilience in the fields of security policy and research. Subsequently, *Markus Promberger* (Erlangen-Nuremberg), *Lars Meier* (Frankfurt/Berlin), *Frank Sowa* (Nuremberg) and *Marie Boost* (Nuremberg) follow up with an investigation of the analytical surplus which can be identified with view to taking in a resilience-orientated research perspective in the course of sociological poverty research. With regard to potentially as well as virtually effective resilience resources, they comparatively investigate empirical cases of autonomously conquered poverty and, relating thereto, social re-advancement in contrast to a case example of social relegation and the herewith connected solidification of poverty. *Marie Naumann* (Trier) proceeds with an objective-hermeneutical analysis of the utilization of the term and/or concept of resilience in the political context of German development policy which the author considers as a first step in the direction of a comprehensive

‘sociology of knowledge of resilience’. In terms of an explorative analysis, she focuses on the internationally operating non-governmental organisation “Welt-hungerhilfe” which is considered as one of the central operational practicing actors in the investigated material context.

Whereas the aforementioned four empirical contributions specifically concentrate on resilience in the context of a certain realm of political action, the following two contributions emphasise a firm cultural and organisational perspective on resilience and, thereby, both explicitly focus on the so-called concept of community resilience. Given that previous discourses already identify the role of a cultural dimension as centrally linked to the understanding of the concept of community resilience, *François Bousquet* and *Raphaël Mathevet* (Montpellier) discuss whether this linkage has to be considered as a question of ‘the resilience of a culture itself’ or of ‘resilience through culture’. Arguing from a social-constructivist perspective, the authors identify the perception of identity and, thereto related, distinctness as the central issue with which the aforementioned ambiguous question deals. Their considerations are illustrated with view to an analysis of the empirical case example of the Spanish festival “La Romeria del Encuentro” which is organised by and yearly held in Mauguio to celebrate the Spanish ‘culture’ or rather ‘identity’ of this French municipality. *Bo Tackenberg* and *Tim Lukas* (Wuppertal) close the volume with a contribution which empirically investigates the role of social cohesion as a central factor for building and enhancing community resilience in the context of the work of civil protection organisations. Thereby, the authors’ considerations are based on a critical review of previous socio-scientific approaches which frame social trust, shared values and norms, reciprocity, participation and social networks as main aspects of social cohesion in a community.

The editors are convinced that the concept of resilience offers interesting and promising ways to approach central societal subjects and spheres of action in the context of the social sciences in general and sociology in particular. Against this background, the present volume shall be understood as an attempt to comprehensively mark the variety of theoretical as well as empirical possibilities to embed and develop previous understandings and conceptualisations of resilience with regard to genuine socio-scientific and sociological questions and issues. In a research pragmatic perspective, it is, moreover, considered to foster the interdisciplinary dialogue on resilience in the aforementioned scientific disciplines.

The volume, thereby, is associated with an intensive discussion which took and still takes place in the context of the DFG-research group “Resilience. Phases of Societal Upheaval in Dialogue between Medieval Studies and Sociology” at the

University of Trier which examines socio-historical processes between the 13th and 16th century and analyses how the concept of resilience can be transferred to add more analytical insights to the investigations of these historical constellations.

We would like to take the opportunity to warmly thank all involved colleagues as well as contributors of this volume for the interesting and inspiring conversations which we have had so far and which, ultimately, led to this book publication. At this point, we also want to express special thanks to David Chandler, Gabriela Christmann and Jonathan Joseph who not only contributed to this volume but also enriched the research groups' work with their research stays and guest lectures at the University of Trier as well as to Antonia Hofmann for the editorial preparation of this volume. With this publication the editors hope to provide a further impetus for both a critical and a constructive discussion of the role and relevance of resilience in the context of the social sciences and sociology.

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Part I
Theoretical Considerations



Resilience Constructions: How to Make the Differences Between Theoretical Concepts Visible?

Stefan Böschen, Claudia R. Binder and Andreas Rathgeber

1 Resilience Constructions: Differences as a Problem

The concept of resilience has performed an amazing career. Starting out in some selected disciplines, such as psychology (e.g., Nöker and Petermann 2008) and ecology (e.g., Gunderson et al. 2010), it has been applied in a vast variety of disciplines including natural sciences, humanities, and social sciences (see Gabriel 2005; Günther 2009; Folke et al. 2010; Brand et al. 2011; Mergenthaler 2012; Endress and Maurer 2015; overview: Wink 2016). Resilience deals with the characteristics of individuals, units—more abstractly: entities—that enable them to not only maintain their identity in face of unusual or critical situations, but to potentially even emerge strengthened from such stressful situations. Its concurrent appearance seems to indicate the far-reaching impact of at present transformation processes. The concept of resilience comes into play when individual entities (no matter if these are individuals, groups or states) must prove their abilities and competences to face the challenges generated in the turmoil of contemporary

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dynamics. Resilience is the ability to resist to these challenges. The way this ability plays out depends not only on the specific capacities of an entity but also on its context.

As the concept of resilience is used by many disciplines and for a wide range of purposes, different ways of theorizing resilience are observed. This is why there are different entities and challenges, many and very different disciplines have been using and interpreting the concept of resilience in a—from their own perspective—fruitful way. Thus, it has also been argued that resilience might be a useful concept for interdisciplinary cooperation (see Günther 2009; Wink 2016). However, although the interdisciplinary application could be seen as useful, the different conceptualizations of resilience suggest that it is too simple to claim the interdisciplinary function of the concept as such. We argue that first of all, the wide-spread usefulness of one and the same concept should make us suspicious and raise some questions. Why could this concept undergo such a career? More specifically with regard to the epistemological form: how is the conceptualization of resilience related to the different applications?

Scholars have shown that there are some relevant differences among the ways in which resilience is conceptualized. On the one hand, the different conceptualisations emerge because the respective studies have very different targets (e.g., Biggs et al. 2012). On the other hand, they depend on the theoretical-conceptual background of the respective reference discipline (see, e.g., Olsson et al. 2014). In addition, it has been reported that the differences do not necessarily imply that the theoretical concepts are totally distinct from each other—on the contrary, there are some remarkable similarities in the design of resilience concepts (see Barrett and Constan 2014). We postulate that the different constructions of resilience are based on different theoretical models. These vary not so much in relation to a specific discipline (as, e.g., Olsson et al. 2014 suggest), but rather in respect to the issues addressed in the scope of specific research projects (see Böschen et al. 2017). Moreover, we hypothesize that a limited number of different theoretical models can be identified.

The following considerations try to answer the double question of whether the projects of a research consortium (on resilience) differ based on the theoretical models they use, and if so how these differences can be classified with regard to specific theoretical features. To put it short, we find that these models can be described by two dimensions, first, the underlying theoretical conceptualization (structural versus process-related) and second, whether relations to the context are part of conceptual considerations or not (context-resilience versus self-resilience). In light of this, our argumentation follows four steps: The first step shows that something like a shared core can, in fact—contrary to the assumptions of differences among

the concepts—be found in the term of resilience (chap. 2). In the second step, in a quantitative analysis, we present the differences of theoretical models of projects of a research consortium (on resilience). To do so, we run a factor analysis based on a survey on the utilization of resilience aspects within the projects. We found that 5 factors explain the differences among the projects' conceptualization of resilience (chap. 3). Third, we further uncover these differences by analysing the results of the factor analysis in relation to the different groups of theoretical models found, and by highlighting one exemplary project per group (chap. 4). In the final fourth step, we bundle the results from these presentations by illuminating the connection between the theoretical models and the application of the term resilience. Finally, we develop perspectives for future resilience research while reflecting on the chosen theoretical presuppositions. This is also a prerequisite for being able to cooperate in trans- and interdisciplinary projects (chap. 5).

2 Theoretical Models of Resilience

The dynamic in the development of concepts of resilience has already led to a diversity that is difficult to oversee. This is reflected in the fact that a large number of studies was set up in the last decade to structure the discourses from various disciplines and to put them at a relationship to each other (see Olsson et al. 2014; Wink 2016). In light of the differences among the theoretical models as presented above, the following observations appear particularly relevant: On the one hand, specific individual indicators of resilience seem to make up the shared analytical core of the term as they are widely used, e.g. the bounce-back ability or adaptability or transformativity (see Keck and Sakdapolrak 2013). On the other hand, it becomes evident that the way in which these indicators are used is anything but consistent and that the architecture of these individual indicators varies as well. This leads us to the above mentioned hypothesis that there are different underlying theoretical concepts of resilience.

Analyses of the differences among the theoretical concepts of resilience have focused so far on normative motives (see, e.g., Olsson et al 2014) or varying goals of the analysis, e.g., enhancement of theoretical understanding versus practical application (see, e.g., Biggs et al. 2012). However, we consider that these explanations are not sufficient. The explanations may be plausible because the concept of resilience is relatively easy to apply in several disciplines and for manifold ways of problem constructions. However, doing so, they underestimate the problem-transforming quality of ways in which resilience is understood. Therefore, it seems to be much more promising to initially look at the constructional act of problem generation and

to then take a close look at the theoretical architecture of resilience used by the scientists. We propose that this architecture is closely related to the selected theoretical model of resilience. A theoretical model thereby is defined as a basal analytical *form* for both opening up new areas of empirical research as well as offering explanatory interpretation of phenomena and which can be used independently of the specific object examined.

Typically, such a theoretical model results from taking a basic path for theory development, especially by selecting basic categories (e.g., specific indicators) and putting them into a coherent form. In physics, a relativistic perspective fundamentally differs from a classical one. In resilience research, a structural perspective differs from a process-related one, accordingly. Additionally, the context also differs in problem-oriented research, to which resilience research belongs to. Whether and how is this context considered and to which extent does it shape the theoretical model? An entity can be understood as a monad and thus with the status of a lone fighter against its environment—or vice versa, the resilience consideration may make the links and interdependencies between entities and their environment the core of a resilience analysis. Before we present this in detail, we want to note that there are important shared features in resilience analysis in spite of the postulated differences in theory-building in resilience research.

2.1 Basic Elements in Definition(s) of Resilience

Looking at an overview of attempts to define resilience (see Holling 1973; Adger 2000; Keck and Sakdapolrak 2013), none of them offers a comprehensive definition, but we can identify some common, basic elements. Resilience means the ability or characteristic of an entity (individual, actor, system) to react to crisis-like impacts in a way that maintains or even increases its ability to act while maintaining its own identity. This is shown in the following core elements of resilience definitions:

1. *Continuity of existence.* Initially, the further, i.e., future continuous existence of a unit, is considered a central aspect. It is by definition not possible for an entity to react resiliently by any form of self-destruction. The altruistic sacrifice for a community is typically not subsumed when we talk about resilience (Holling 1973; Walker et al. 2004), even if the altruistic sacrifice were the case from the point of view of the community itself (we refer to this duality as the differentiation between self- and context-resilience; see below).

2. *Preservation of core properties.* This criterion deals with the *form* of preservation of the entity. Preservation of identity hardly means that an entity will not change at all. Instead, independently on whether a resilient reaction simply takes the form of a bounce-back or a far-reaching system change, in any case the entity has to remain identifiable and therefore finally describable with selected properties (Walker et al. 2004).
3. *Event that acts or is interpreted as a disturbance.* Resilience mostly appears in reaction to a specific event that triggers a ‘stress’ for the entity. It is initially irrelevant whether this is a factual or a perceived ‘stress.’ Following the so called ‘Thomas Theorem’ (Thomas and Thomas 1928) things are factual in their consequences if they are seen as real by social actors. Therefore, obstacles are subject to a construction process, as well as strategies are to manage such obstacles.
4. *Situation-related management reaction, further development and reorganization to create new options.* This criterion finally treats the form of resilient reaction options of the entity across all existing differences. The resilient reaction of the entity takes place based on certain properties. These are usually based on competences, such as media competence or interaction competence. Such competences offer the entity options to react on events, which may reach from bounce-back to adjustment, to transformation, in a then resilient way (Keck and Sakdapolrak 2013).

Therefore, resilience is always a relation with multiple points in which at least one triggering event, one entity and its reaction are linked to each other. Moreover, constructional moments are highly relevant. The perception of an event as a threat is a constructional process. Only in some cases, this can be condensed in a stimulus-reaction scheme and thereby in an essential way. The explicit design and examination of this relation, however, essentially depends on the respective specific theorisation of resilience. Which ways of constructing such theoretical models can be differentiated?

2.2 Two Dimensions of Theoretical Models

We consider two dimensions particularly relevant for the construction of theoretical models: The chosen theoretical concept and the contextualisation of the entity examined. The first dimension (structure/process-related consideration) of theoretical models refers to the theoretical perspective chosen that aligns the conceptualization. It can focus on the structure of a system or on its dynamics

(processes). For sure, structures and processes are necessarily interlinked. This means, structures can also be understood as dynamic equilibrium within processes and the procedural change in a system can only be measured making reference to its structure. But, there is a decisive difference based on which of the both perspectives is exposed and analytically put at the focus. The *structure observation* puts the system at the focus. This perspective on resilience is often used in social-ecological research. This is about maintaining a system and its functions; the focus is put on preservation (Walker et al. 2004). The *process observation*, in contrast, puts the learning capacity of a system at the focus. In this case, resilience means analysing the design options that preserve the innovation capacity of a system (see, e.g., Folke et al. 2010). The focus is on process observation, referring to changes to be assessed as resilient (see Luthe and Wyss 2015).

The second dimension refers to the fact that resilience analyses necessarily relate entities to their environment(s) (Folke et al. 2010; Walker et al. 2004). It is often assumed that increasing resilience of one entity is aligned with an improvement of resilience for other or superordinate entities or units. However, what happens if increased resilience of one entity reduces the resilience of another one? Self-resilience (‘first-order resilience’) describes the resilience of an entity in the context of its directly related environment. As this perspective does not consider to which extent this entity promotes or impairs the resilience of linked entities, another type of context-relation has to be considered. We suggest to distinguish context-resilience (‘second-order resilience’) from the above-presented self-resilience. It describes the specific resilience qualities of an environment of an entity. The contrast between these two forms of resilience offers a measure for making visible whether the resilience of an entity is related to the one of its environment or is de-coupled.

3 An Empirical Test: Four Theory Models of Resilience

We performed a survey to explore which different interpretations of resilience were present in the different disciplines and projects. The survey was based on the “resilience questionnaire” for social-ecological systems SES (Walker et al. 2006), and was adjusted specifically to include key aspects of resilience relevant for social systems (see the concept of Lebel et al. 2006). The questionnaire was put together by the following sections: a first section elicited general project-related information (such as the disciplinary background and research focus). A second section focused on indicators indicating on how the projects framed resilience allowing for the differentiation of theory models (see Table 1).

Table 1 Important indicators typically used in concepts of resilience and their assumed indication for respective dimensions (we also report indicators in the questionnaire which turned out not being selective)

| Indicator | Aim of question? | Structure/Process | Self-/Context- |
|---------------------------------|--|---------------------------------|--|
| Resilience of self, and context | Does it make sense to differentiate between self- and context-resilience? | – | High: context-resilience Low: self-resilience |
| Tipping points/ thresholds | Are tipping points and thresholds important for the project? | High: structure Low: process | – |
| Risks | Are the risks conceptualized as measurable factor? | High: structure Low: process | |
| Actors | Are knowledges as well as motifs of activity relevant for actors? | – | – |
| Diversity | Which importance is laid on the diversity of entities related to the entity under consideration? | – | High: context-resilience Low: self-resilience |
| Connectivity | How important is the interrelation between the different entities looked at? | – | High: context-resilience Low: self-resilience |
| Adaptability | Where and how adapts the analyzed entity to a change in environment? | – | – |
| Institutions | How important are institutions in the theoretical model of the research project? | High: Structure Low: Process | |
| Scales (geographic + social) | Differentiation by type and number | – | – |

It has to be noted that the relationship between theoretical models and indicators is only possible if the indicators can be allocated to a specific component of the theoretical model. Indicators are interpreted as information providers. This means, for example, that the indicator diversity does not measure the diversity of components of an entity (as interpreted by Folke et al. 2010), but determines the diversity of the setting surrounding an entity. Finally, some indicators cannot be related to a specific dimension or expression of it.

The results of the cluster analysis, combined with individual project analyses, permit an initial typology of theoretical models of resilience. The first dimension in the topology defines the basic orientation in the concept, with either stability (structure) or growth (process) being the issue to be theorised. The second dimension defines the relevance of context for the resilience concept and distinguishes between self-resilience and context-resilience. Based on this, four theoretical models of resilience can be distinguished (see Table 2).

In order to analyse and interpret the differences between the groups, a principal component analysis was conducted as well. In the scope of this, the most important factors for the different projects are identified (see Hartung and Elpelt 2007). The basis comprised all groups of questions as given in Böschen et al. (2017), with the exception of the questions regarding the scales. The latter were not used, as in Böschen et al. (2017), because these questions were based on a different scale. For this, the answers to the groups of questions were transformed into factors using a principal component analysis. It becomes evident that five factors are sufficient to explain 86% of the variance of the answers. These five factors were rotated in the second step, in order to provide better interpretation opportunities. The loading matrix resulting according to the Varimax rotation is presented below. It indicates which answers are included in the calculation of each individual factor and how strongly.

Table 2 Typology of Theoretical models of resilience

| Perspective to Context | Theoretical Concept | |
|------------------------------|---|--|
| | Structure | Process |
| Closed (Self-Resilience) | <i>Focus of research:</i> entities, their form and stability Stability Model (Gr I) | <i>Focus of research:</i> entities, their reaction and change Expansion Model (Gr III) |
| Open (Context-Resilience) | <i>Focus of research:</i> entities, their stability in relation to a specified context Interference Model (Gr IV) | <i>Focus of research:</i> entities, their co-stabilization in relation to the context Transformation Model (Gr II) |

Table 3 shows that the first factor is strongly characterised by the difference between the *context and conceptualisation perspective*, or more specifically: positively dependent on the *resilience order and negatively on tipping points/thresholds*. Similar findings can be made for the second factor. Again, the context perspective (here: the *diversity*) is applied positively and the conceptualisation perspective (*risks*) negatively. The third factor is strongly determined by entity, adaptability and connectivity and negatively affects the context variables with the latter. While the fourth factor is not characterised by the two perspectives, the conceptualisation perspective is relevant for the fifth one. This primarily negatively affects the institutions and positively affects the thresholds. All in all, factor 1 and 2 reflect the differences between the perspectives, while factors 3 and 5 are assigned to one perspective each (rather negatively charged). Even though the fourth factor cannot be assigned to the perspectives, it is a factor that helps distinguish the projects. It positively affects time and negatively affects normativity.

Table 3 Rotated loading vectors for the first five factors (Method Varimax)

| | | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|----------------|----------------|-----------------|-----------------|----------------------|--------------|----------------|
| | | 0.03 | -0.10 | 0.34 | -0.04 | -0.06 |
| Entity | | 0.04 | -0.05 | 0.35 | 0.03 | 0.13 |
| Order | Context | 0.66 | 0.16 | 0.16 | 0.13 | 0.31 |
| Time | | 0.13 | 0.14 | 0.17 | 0.45 | -0.03 |
| Risks | Concept | -0.01 | -0.80 | -0.02 | -0.13 | 0.12 |
| Tipping Points | Concept | -0.68 | 0.14 | 0.17 | 0.07 | 0.33 |
| Actors | | -0.25 | 0.01 | -0.08 | 0.39 | -0.07 |
| Diversity | Context | 0.01 | 0.48 | -0.27 | -0.27 | 0.13 |
| Institutions | Concept | 0.00 | 0.06 | 0.05 | 0.05 | -0.85 |
| Connectivity | Context | 0.15 | -0.18 | -0.43 | -0.12 | 0.00 |
| Adaptability | | -0.03 | 0.02 | -0.61 | 0.14 | 0.07 |
| Normativity | | -0.04 | 0.13 | 0.17 | -0.70 | -0.07 |
| | Direction | Context-concept | Context-concept | Context | | Concept |
| | Most important | Order | Diversity | Besides adaptability | Normativity | Institutions |
| | Factors | Tipping points | Risks | Connectivity | Time | Tipping points |

In the last step, the values of the factors in the four theory models are determined. For this, the values of factors 1–5 for the individual projects are calculated (Table 4).

They are determined and then the arithmetic average is calculated across all projects that were assigned to a model in the cluster analysis at Böschén et al. (2017) (Table 5).

Against this background, the first important question is whether the identified factors can be related to the four theory models of resilience highlighted before. By grouping concepts and factors, one can first state that the process-related concepts have a positive value of factor 5 while the structure-oriented concepts have a negative one. Similarly positive values of factor 3 coincide with a context-resilience whilst negative value are in line with the self-resilience. The results related to factor 1 and 2 seem to be a bit more puzzling. This is why this factor combines contrasting elements. Therefore, the extreme values positive are related to a contextual and process related perspective and vice versa. By emphasizing specific qualities one gets the following connection between models and the main factors (cf. Table 6).

Table 4 Value of the factors for the different projects. (In bold are the sample projects analyzed in detail)

| Projects | Group | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|--------------------|-------|--------------|--------------|--------------|--------------|--------------|
| 2 | I | 0.03 | −0.67 | 0.50 | 0.06 | −0.55 |
| 9 | I | −0.27 | 0.07 | 0.90 | 0.71 | −1.00 |
| 8 | II | 0.16 | 0.48 | 0.07 | 0.10 | −0.55 |
| 11 | II | −0.02 | 0.17 | 0.20 | −0.55 | −0.25 |
| 3 | III | 0.57 | −0.90 | 0.60 | −0.23 | 0.07 |
| 4 | III | −0.40 | −0.11 | 0.37 | 0.38 | 0.23 |
| 7 | III | 0.62 | −0.07 | 1.00 | 0.91 | 0.70 |
| 12 | III | 0.60 | 0.09 | 0.17 | 0.78 | 0.31 |
| 13 | III | 0.33 | −0.04 | 0.02 | 0.41 | 0.07 |
| 1 | IV | −0.64 | −0.25 | −0.07 | 0.17 | 0.44 |
| 5 | IV | −1.00 | −0.73 | 0.00 | 0.70 | −0.51 |
| 6 | IV | 0.16 | −1.00 | −0.10 | 1.00 | −0.57 |
| 10 | IV | −0.39 | 0.18 | 0.21 | 0.26 | −0.32 |
| Mean | | −0.02 | −0.21 | 0.30 | 0.36 | −0.15 |
| Standard Deviation | | 0.50 | 0.47 | 0.36 | 0.46 | 0.49 |

Table 5 Value of the factors for the different projects. (Depicted in bold are the groups with the highest and lowest values)

| | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|--------|--------------|--------------|-------------|--------------|--------------|
| Gr III | 0.34 | -0.21 | 0.43 | 0.45 | 0.28 |
| GR IV | -0.47 | -0.45 | 0.01 | 0.53 | -0.24 |
| GR I | -0.12 | -0.30 | 0.70 | 0.39 | -0.78 |
| Gr II | 0.07 | 0.33 | 0.13 | -0.23 | -0.40 |

Table 6 Typology of theoretical models of resilience and the related factors

| Perspective to Context | Theoretical Concept | |
|---------------------------|---|---|
| | Structure | Process |
| Closed (Self-Resilience) | <p><i>Focus of research:</i> entities, their form and stability</p> <p><i>Factors:</i> (negative Values for factor 2), positive value of factor 3, almost positive factor 4 and negative value of factor 5</p> <p>Stability Model (Gr I)</p> | <p><i>Focus of research:</i> entities, their reaction and change</p> <p><i>Factors:</i> about zero for factor 2, slightly positive value on factor 3, positive value for factor 4 and slightly positive value of 5</p> <p>Expansion Model (Gr III)</p> |
| Open (Context-Resilience) | <p><i>Focus of research:</i> entities, their stability in relation to a specified context</p> <p><i>Factors:</i> about zero value of factor 2 and negative value of factor 3, (almost positive value for factor 4)</p> <p>Interference Model (Gr IV)</p> | <p><i>Focus of research:</i> entities, their co-stabilization in relation to the context</p> <p><i>Factors:</i> positive value of factor 2, (slightly negative for factor 3) and negative value of factor 4</p> <p>Transformation Model (Gr II)</p> |

We saw within this section that there is a plausible correlation between the models and selected factors. Nevertheless, we found that the references between factors and models are not conclusive in all cases. Therefore, a deeper analysis seems to be appropriate.

4 Theoretical Models and the Construction of Resilience

Such a deeper analysis should shed light specifically on the contrasting values of the factors discussed above. Some of the inconclusive findings seem to be related to the fact that the factors in some cases combine conceptual as well as contextual

indicators. Therefore, the interpretation of specific values of factors becomes a difficult task. We assume that it might be helpful to look at the different theoretical models while doing two things. First, to discuss in an overview the different cases (i.e., specific projects) found in the collaborative research program. Thereby, the specificity of the different factors is reflected in an overarching way. Second, one selected project is discussed exemplarily per theoretical model. This is done to offer an insight why there are obvious inconsistencies in the relation between factors and theoretical models. Our assumption is that relations between models and factors are resulting in a more difficult picture as the indicators behind influence these. Thus, the four theoretical models of resilience are specifically detailed based on a qualitative analysis of selected projects from the examined research cooperation, highlighting the relevance and effectiveness of this theoretical-conceptual model formation.

4.1 Expansion Model (Gr III)

Projects from this group have a procedural understanding of resilience and examine the reactions of the entities in change. Their object of study is the entity itself and its ability to react. Self-resilience is at the focus. All the projects have a positive value of factor 3, which is related to a negative value of the context-resilience indicator ‘connectivity’ (see Table 1 and Table 3). This matches not only with the perspective of self-resilience in this model, but also indicates a clear contrast to Gr IV—which is positioned diametrically opposite to Gr III. This is also indicated by a low factor 2. Looking at factor 5, one can see a positive value indicating a process-oriented view. Moreover, the groups Gr I and Gr III (both following a self-resilience perspective), which at the same time differ in the theoretical concept, are distinguishing most with regard to factor 5. Finally, looking at the aspect of the theoretical perspective, with one exception, the value of factor 1 is slightly positive, meaning that in these cases the indicator ‘threshold’ is low as there is a minus (see Table 1 and Table 3). This relates to a process-related concept for theory. Examples from the research cooperation are studies on the change of the media system (P7; Meyen et al. 2014), the change of the work organisation towards team-based work (P3), change of specific corporate structures under internationalisation conditions (P4), change to consulting structures from foreign policy (P12), and changing cascade use of forests (P13).

For a more detailed analysis, we look at the project 13. In the scope of this project, a clear field of transformation is put at the focus, which WBGU (2011) also dealt with in its World in Change study: sustainable use of wood. WBGU

recommended to support cascade use of wood from sustainably managed and certified forests (see ForChange 2017, p. 257). In light of this, the project turned to the question of how transformation paths could be identified in the scope of a defined wood use and forest system and which factors could strengthen or weaken these.

Factor 4, which includes the order of time positively and that of normativity negatively, is particularly relevant for this project. In this case, it appears particularly noticeable that both aspects are of high importance for the conceptualisation of the project. Although the project raises a specific normative demand, it transfers it into analytically-empirical issues to specifically include the aspect of normativity only as a justifying background assumption. Furthermore, the project analyses long periods of time, asking about the conversion-critical relevance of time. This results specifically from dealing with transformation paths.

Factor 1 indicates a process-related perspective as the indication of thresholds is low. This is why, as it has to be noted, that one selected research strategy seems to have led to this specific loading of the factor. This is based on the conceptualization of change within a model of interrelated systems, “[...], one is a socio(political)-ecological system under forest management while the other is a socio(technical)-economic system under industry management” (Bobar and Winder 2017, p. 194). This interrelatedness in the empirical situation corresponds to a theoretical model based on a process-related perspective. At the same time, several influences from the context were used to describe changes of the wood use and forest system. In describing the cascade use of wood, possible thresholds (indication for self-resilience) were given less attention in order to characterise the transformation processes in this.

All in all, the project showed on the one hand that the forms of sustainable forest use and wood management did only multiply but also spread. On the other hand, it showed that this process was brought about by “institutionalisation of networking and innovation promotion” (ForChange 2017, p. 258) which also stabilised it.

4.2 Stability Model (Gr I)

Projects of this group have a structural understanding of resilience and combine this with a closed context perspective (focus on self-resilience). This corresponds to an analysis of preservation and stability of the entity. It differs from group IV in particular in factor 3 (context factor), which refers to connectivity. The central difference from group III can be found in the context perspective of factor 5.

Factor 5, which loads on institutions and thresholds, is negative in case of Gr I, whereas it is positive or group III. Group I differentiates itself from Gr II in factor 2, which contains both the context and conceptualisation perspectives in diversity and risks. Typical examples for this are the ecosystems (Holling 1973), development of economies under special consideration of the system transformation of Communism into a market economy or the conversion of legal systems (Frensch 2015). Both projects from the consortium that fall into this group treat issues of stability, in one case based on international economic disturbances leading to weaker legal prerequisites for an economic equilibrium (P2), and in the other case from digital change leading to growing relevance of media competence as a resilience resource (P9).

Exemplarily, we focus on P9. Project nine asks a central research question regarding resilience: How does media competence develop from the teens into the young adult age? Is media competence an important resilience factor? (See Gralke et al. 2017a, b) The main proposition is that media competence is a (protective) resilience factor that protects from potential risk factors such as the rapid media change and negative media effects, while at the same time serving to utilise the positive potential of media. It can be recorded as a central result that media competence correlates positively with positive development factors and negatively to inhibiting factors. However, a relationship between media competence and the scope of resilience according to Connor and Davidson (2003) could not be found, which is particularly due to the construction of the measure. Project 9 also showed that media competence correlates positively with the interest in politics in the model, which in turn influences the self-concept of young recipients. This provided initial evidence for media competence being a resilience factor for youths and young adults.

Braun et al. (2018) describe resilience as a resistance fed by various resilience or protective factors. From a developmental psychological point of view, a protection factor is a measurable characteristic of persons or environmental conditions that predicts a positive development during the transition to adulthood. These factors ensure a healthy and successful development in spite of possible risks and dangers of the environment. The research project is thereby based on the seminal work by Werner et al. (1971), according to which resilient children were successfully integrated into the community in spite of harmful initial conditions.

Project nine thus generally focuses on resilience of the entity and therefore on first-order resilience. Resilience factors therefore are personal characteristics. Media competence positively correlates with these protective factors, such as intelligence, mathematical skills, success at school, media diversity, interest in politics,