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# Societal transitions of work and health from the perspective of subjectification – Critical synthesis of selected studies from Applied Psychology<sup>1</sup>

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## ABSTRACT

Synthesized are seven studies on work and health, conducted in an interdisciplinary collaboration between applied psychology and occupational medicine. Based on thematic analysis, this critical interpretive integration operationalizes the „*subjectification of work*“ as complementary trends of *intensification* (performance focus), *internalization* (goal adoption), and *individualization* (job personalization), embedded in broader contexts of employment insecurity (employee self-reliance). Applied structuring schemes include: a) focus primarily on *work task* (activity) or *work setting* (context); b) references to (or connections with) aspects of subjectification (primary and secondary); and c) theoretical and empirical relationships with negative and positive short-, medium-, and longer-term *health outcomes*. Work tasks are investigated in four studies; three focus on contextual factors of the work setting; work intensification is examined in four; internalization processes in five; individualization of work in three. Identified are tensions between motivational effects of individualizing work and internalization of organizational goals, coupled with inherent tendencies of work intensification. Associated structural and psychological dynamics are discussed as risks factors for dysfunctional self-management, reflecting internalized incompatibilities between work and health. Outlined are implications for reevaluating assumptions of voluntariness, personal choice, and agency in psychological research on work and organizations. Lastly, discussed are broader paradigm shifts, necessary for the discipline to address the most challenging social and ecological issues.

## Keywords

Work and health – neoliberal transformation – work systems analysis – subjectification of work – research synthesis – meta-study – paradigm shifts

## 1 Introduction

Fundamental transitions in the world of work require integrated conceptual frameworks of currently evolving challenges that face applied psychology and related disciplines within social science, medicine, and adjacent fields (e.g., Bliese, Edwards & Sonnentag, 2017; Korunka & Kubicek, 2017; López-Andreu, 2019; Moscone, Tosetti & Vittadini, 2016; Seubert, Hopfgartner & Glaser, 2019). Importantly, public, oc-

cupational, and individual health and well-being need to be understood, protected, and promoted not only at the workplace-level, but within broader political-economic and socio-cultural contexts and developments. This article seeks to contribute to a called-for, integrated and reflexive, interdisciplinary, and explicitly humanization-oriented perspective (Bal & Dóci, 2018; Hornung & Sachse, 2020; McDonald & Bubna-Litic, 2012; Weber, Höge & Hornung, 2020). It presents a meta-study of seven empirical investigations within

<sup>1</sup> Earlier versions of this article were presented virtually at the 60th Annual Meeting of the German Society for Occupational Medicine and Environmental Medicine (DGAUM Jahrestagung, 2020), 67th Spring Congress of the Society of Occupational Science (GfA Frühjahrskongress, 2021), and International Psychological Applications Conference and Trends (InPACT, 2021). The authors thank Jürgen Glaser and Peter Angerer for their contributions. A Carnegie Mellon University Heinz School postdoctoral fellowship supported parts of this research.

applied (work and organizational) psychology. Each study addresses health-relevant aspects of work and employment in contemporary organizations compiled as part of an interdisciplinary research collaboration with occupational medicine (Glaser & Hornung, 2007; Seubert, Hornung & Glaser, 2015). The presented synthesis aims to show how these topics are interconnected and complementary from a meta-perspective, which takes into account broader societal changes and trajectories. This undertaking is based on identifying prototypical trends in the ongoing transition of work and assessing their relevance for complex dialectical relationships between work and health, characterized by simultaneous conflicts, synergies, and trade-offs (Glaser, Hornung & Höge, 2019). Subsequently, efforts are made to explore, evaluate, and explain how these transitional tendencies are reflected in topics, constructs, and results of reviewed studies. Methodologically, this qualitative meta-study uses a narrative and hermeneutic approach. It adapts elements of thematic analysis, as an iterative content-analytical (deductive-inductive) process of theory-based and exploratory structuring, categorization, and synthesis, with the stated goal of building and applying a suitable framework for „problematizing“ current challenges in the transition of work and health.

Derived from the interdisciplinary literature and suggested as dominant tendencies in transitional patterns of work, organizations, and employment in advanced neoliberal economies are processes of intensification, internalization, and individualization (e.g., Allvin, Aronsson, Hagström, Johansson & Lundberg, 2011; Burchell, Ladipo & Wilkinson, 2002; Farrugia, 2019; Greene, 2008; Korunka & Kubicek, 2017; Weiskopf & Loacker, 2006). These interdependent, yet conceptually distinct trends are outlined and illustrated by embedding reviewed studies into the broader socio-cultural and historical dynamics of societal, economic, and workplace change. Tripartite tension fields among and within each of the identified trends toward intensification, internalization, and individualization are suggested as building blocks of a dynamic framework for analyzing work in transition. This approach aims to better reconcile research in psychology with critical analyses in other social science disciplines, such as history, anthropology, sociology, and critical management studies. These disciplines have developed sophisticated theories and concepts, addressing issues connected to the „subjectification“ of work (e.g., Becke, 2017; Moldaschl & Voß, 2002), „advanced neoliberal governmentality“ (e.g., Munro, 2012; Pyysiäinen, Halpin & Guilfoyle, 2017), „biopower and biopolitics“ (e.g., Moisaner, Groß & Eräranta, 2018), and post- or meta-disciplinary work regimes (e.g., Weiskopf & Loacker, 2006; Welsh, 2018). The stated goal here is to critically reflect and reinterpret the reviewed psycho-

logical research and its obtained results in light of the latter interdisciplinary body of theories, concepts, and observations (e.g., Hornung & Höge, 2021).

Against this background, the presented synthesis is oriented towards critical reflexivity, focusing on how tendencies associated with subjectification of work, specifically, dynamics of a) *intensification* (escalating performance requirement), b) *internalization* (employee identification and goal adoption), and c) *individualization* (personalization of work tasks and setting) are represented and reproduced in different degrees in the examined research topics, contexts, and results. To structure this research overview, three main content-analytical schemes (taxonomies or categorizations) were applied, which aspired to integrate core theories and assumptions of work psychology relevant to occupational health as examined in the presented studies: 1) focus on work task (activity) versus work setting (context); 2) references to, indication for, or connection with identified tendencies (facets or dimensions) of subjectification, operationalized in terms of primary (proximal, direct, explicit) versus secondary (distal, indirect, implied) relevance for the respective aspects; and 3) theoretical and empirical relationships with positive and negative short-, medium-, and long-term motivational, health, and socializing (personality-shaping) work effects. The resulting framework will be introduced next, followed by short descriptions and thematic classification of empirical studies, the aggregated presentation of results, and a concluding discussion.

## 2 Subjectification of work

Developing the thematic analysis scheme, i.e., the interconnected tripartite content-analytical framework of categorizations described above, involved scoping and extracting trends from the interdisciplinary psychological, sociological, economic, and management literature on the contemporary transformation of employment, work, and organizations. Explicitly aiming to assimilate a critical perspective, sources were selected to represent social criticism of the dominating political-economic system in the post-industrial (also post-Fordist, post-Taylorist, post-modern, post-disciplinary) era of advanced neoliberal capitalism and its manifestation in contemporary workplace regimes (e.g., Farrugia, 2019; Munro, 2012; Welsh, 2018). The literature review generated major themes or tendencies, subsumed under the framework of the „subjectification of work“ (e.g., Becke, 2017; Pongratz & Voss, 2005; Weiskopf & Loacker, 2006). Based on their significance and applicability for synthesizing the present research, relevant themes were sorted into three categories, reflecting processes associated with the a)



*intensification*; b) *internalization*; and c) *individualization* of work as three interdependent dimensions capturing tendencies of subjectification at work, embedded in a broader, overarching theme of increased insecurity and uncertainty at work, holding individual employees responsible for systemic problems and societal risks. A central meta-dimension, energizing or „driving“ identified tendencies of subjectification, is job insecurity (personal risk), associated with rising precariousness in employment practices (e.g., Seubert et al., 2019), cultivated in neoliberal management ideologies of employee self-reliance (e.g., Edwards, Rust, McKinley & Moon, 2003; Greene, 2008). Building a conceptual bridge between these critical analyses and the applied psychological literature is a *paradox perspective*, based around the core notion that dynamics in organizations are best understood in terms of conflicts of interests, tensions, dialectics, and double-binds (e.g., Putnam, Fairhurst & Banghart, 2016). The present summary emphasizes conflictual dynamics and challenges arising for individual well-being and health in the context of the above identified aspects of the intensification, internalization, and individualization of work, which are further elaborated on below. Table 1 summarizes the framework used to study subjectification of work, including a description of the core themes for the three dimensions, resulting in paradoxical tensions for employees, managerial func-

tions of subjectification, relationships with insecurity at work, and relevant exemplary constructs in applied psychology.

## 2.1 Work intensification

Work intensification is a widely observable and generalizable consequence of the economic primacy in employed work, exemplified in organizational interests to maximize operational efficiency, to increase production or service outcomes, and to reduce costs (e.g., Burchell et al., 2002). From a critical perspective, work intensification is an inherent property of capitalist economies, reflecting the systemic necessity of employer and managerial efforts to generate and extract additional (surplus) value with the same or less inputs to compete with alternative investments in the perpetual drive for capital accumulation (e.g., Sayers, 2007; Thompson, 2010). From a managerial view, intensification refers to desirable performance „improvements“, achieved by increasing the quantitative amount of work and/or qualitative work requirements. For employees, work intensification results in excessive work pressure and overload, that is, the need to work harder, faster, or longer hours (e.g., Burchell et al., 2002; Korunka & Kubicek, 2017). Theoretically and empirically related yet distinct, the temporal prolongation or extensification of work, is also subsumed under

Table 1: Summary of framework to study subjectification of work.

Dimensions of subjectification	Work intensification	Work internalization	Work individualization
<b>Description of core theme</b>	Continuous or intermittent performance increases through higher quantitative amount of prescribed work and/or extended qualitative or behavioral work requirements	Employee endorsement, identification with, and psychological integration of organizational or managerial work-related performance-oriented norms, goals and values	De-formalization, de-standardization, flexibilization, and personalization or person-specific customization of jobs, organizational structures, and human resource practices
<b>Paradoxical tensions for employees</b>	Activating occupational challenges and learning opportunities vs. Performance pressure and work overload	Intrinsic motivation and autonomous regulation vs. Overcommitment, self-endangering work behavior, and self-exploitation	Self-determination and need-based job personalization vs. Divisiveness, social isolation and precarization of work arrangements
<b>Managerial function of subjectification</b>	Externalization of negative work-health impacts on individuals and society	Indirect control through employee responsabilization and self-management	Erosion of standards for labor protection, broad benefits, and collective bargaining
<b>Relationships with insecurity</b>	Insecurity as driver to enforce intensification	Internalization as coping to reduce insecurity	Individualization as structural enabler of insecurity
<b>Exemplary constructs in applied psychology</b>	Work stressors (e.g., time pressure, quantitative and qualitative work overload), work-family conflict and work-life or work-home interference	Affective commitment, job involvement, work engagement, organizational and occupational identification, self-actualization, meaning	Individual negotiation of work and employment conditions (idiosyncratic deals), self-enacted changes through job crafting, proactive work behavior

intensification here (e.g., Allvin et al., 2011; Kubicek & Tement, 2016). For employees in contemporary, progressive high-involvement workplaces, intensification manifests itself in tensions between positive challenges and occupational learning opportunities versus work overload and stressors (e.g., Pérez-Zapata, Pascual, Álvarez-Hernández & Collado, 2016; Pongratz & Voss, 2005). As part of the responsibility-shift inherent in regimes of subjectification, this increasingly includes organizationally „externalized“ long-term healthcare costs in flexible and precarious employment arrangements (e.g., Moscone et al., 2016; Pedaci, 2010; Seubert et al., 2019), and individually „internalized“ behavioral and attitudinal work requirements and performance pressure. Strategically implemented uncertainty, in turn, ensures ongoing self-directed (subjectified) work intensification (e.g., Höge, 2019), as a form of psychological governance, reinforced by mobilizing employees to compete against each other for „high quality“ work and developmental assignments, a typical feature of market-oriented neoliberal workplaces.

## 2.2 Work internalization

Traditionally in the core disciplinary focus of research in work and organizational psychology, processes of internalization are often examined with regard to employee endorsement, adoption, identification with, and cognitive integration of organizational or managerial (typically performance-relevant) goals, norms, and values (e.g., Brown, 2017; Miscenko & Day, 2016; cf. Hornung & Höge, 2021). However, internalization is not only at the core of instrumental „managerial“ constructs, such as organizational commitment, involvement, and identification, but also plays a central role in (quasi-intrinsic) autonomous work motivation and psychological regulation of work activities (e.g., Ryan & Deci, 2000). From the perspective of subjectification, tensions between tendencies of psychological internalization and systemic work intensification manifest as paradoxes between motivation and self-regulation at work versus „pseudo-intrinsically“ motivated and „self-executed“ behavioral tendencies in the form of self-endangering and „overcommitted“ work behavior and dysfunctional coping strategies, potentially causing erosion of medium- to long-term psychological and physiological health and work ability (e.g., Deci, Dettmers, Krause & Berset, 2016; Dettmers, Deci, Baeriswyl, Berset & Krause, 2016; Höge, 2019; Laurence, Fried & Raub, 2016; Pérez-Zapata et al., 2016). These ambiguities are reinforced by or seen as a consequence of indirect and individualizing organizational (managerial) control practices, such as delegation of responsibility, goal setting, and self-management, eliciting self-directed and autonomously regulated increases in work performance, i.e., self-enacted or sub-

jectified work intensification. A particularly instructive analysis and critical assessment of these „progressive“ management practices as technologies of subjectification is provided by Weiskopf and Loacker (2006), including the underlying subtle shifts towards indirect coordination and internalized control.

## 2.3 Work individualization

In the context of work and employment, individualization refers to de-formalization, de-standardization and flexibilization, and personalization or person-specific customization of jobs or positions, organizational structures, and human resource practices (e.g., Bal & Hornung, 2019; Hornung & Höge, 2019; Hornung & Sachse, 2020). Although research typically focusses on the advantages of these developments (e.g., increased opportunities for self-actualization at work) over conventional rule-bound and formalistically „impersonal“, rigid bureaucracies, the downsides of the individualization of work are seen in the erosion of employment standards, collective agreements, and other protective labor policy mechanisms (e.g., Allvin et al., 2011; López-Andreu, 2019). For employees, in general, individualization opens up conflictual areas of tension between self-determination and self-design of work tasks versus increasing uncertainty and insecurity, social isolation and loneliness, and stressful coping behavior, required for the self-responsible fulfillment of expansive and/or unpredictable performance and behavioral demands in increasingly precarious work arrangements (e.g., Weiskopf & Loacker, 2006). Increasing importance of such inherent tensions, contradictions, and paradoxes of individual self-control and self-exploitation has been identified as a central characteristic of employment under the post-disciplinary regimes of progressive flexible work systems, as discussed, for instance, by Deci et al. (2016), Dettmers et al. (2016), and Glaser et al. (2019).

## 3 Psychology of work and health

The second applied thematic frame draws on the core mission and responsibility of work psychology as the human-centered and humanization-oriented analysis, evaluation, and design of work systems, tasks, and processes (e.g., Oesterreich & Volpert, 1986; Glaser & Hornung, 2007; Seubert et al., 2015). A conceptual framework informing this meta-study is the Organization–Task/activity–Individual (OTI) approach (Büssing, 1992), which is a theoretically elaborated, empirically tested, and practically applicable model of work systems based on sociotechnical design (e.g., Ulich, 2015), forming the basis of psychological work and activity analysis, assessment, consulting, and in-

terventions (Glaser, Hornung, Höge & Strecker, 2020). The OTI approach positions the work activity as the nexus of interdependent pathways of reciprocal (bi-directional) influence between the organizational structure (division of labor, supervision, discretion) and the working individual (occupational health, skills, abilities, attitudes, motivation). Thus, it builds on and extends notions of reciprocal determination in activity theory, social cognitive theory (Weber & Jeppesen, 2017), and interactional psychology (Terborg, 1981). The three distinguished core domains of analysis are the work activity, the individual, and organizational structure. Each of these domains appears to entail a particular relevance for the identified trends of inten-

sification (activity), internalization (individual), and individualization (organization), and is likely affected in specific or differential ways by the respective trajectories. In the following, some theoretical considerations on work systems and health impacts of work are summarized, drawing on the psychological literature, specifically the OTI approach and related socio-technical models. Figure 1 offers an overview of the broader framework applied here, its central concepts and distinctions, as well as some core results regarding the allocation of the seven studies to categories of the qualitative synthesis, details of which are provided further below.

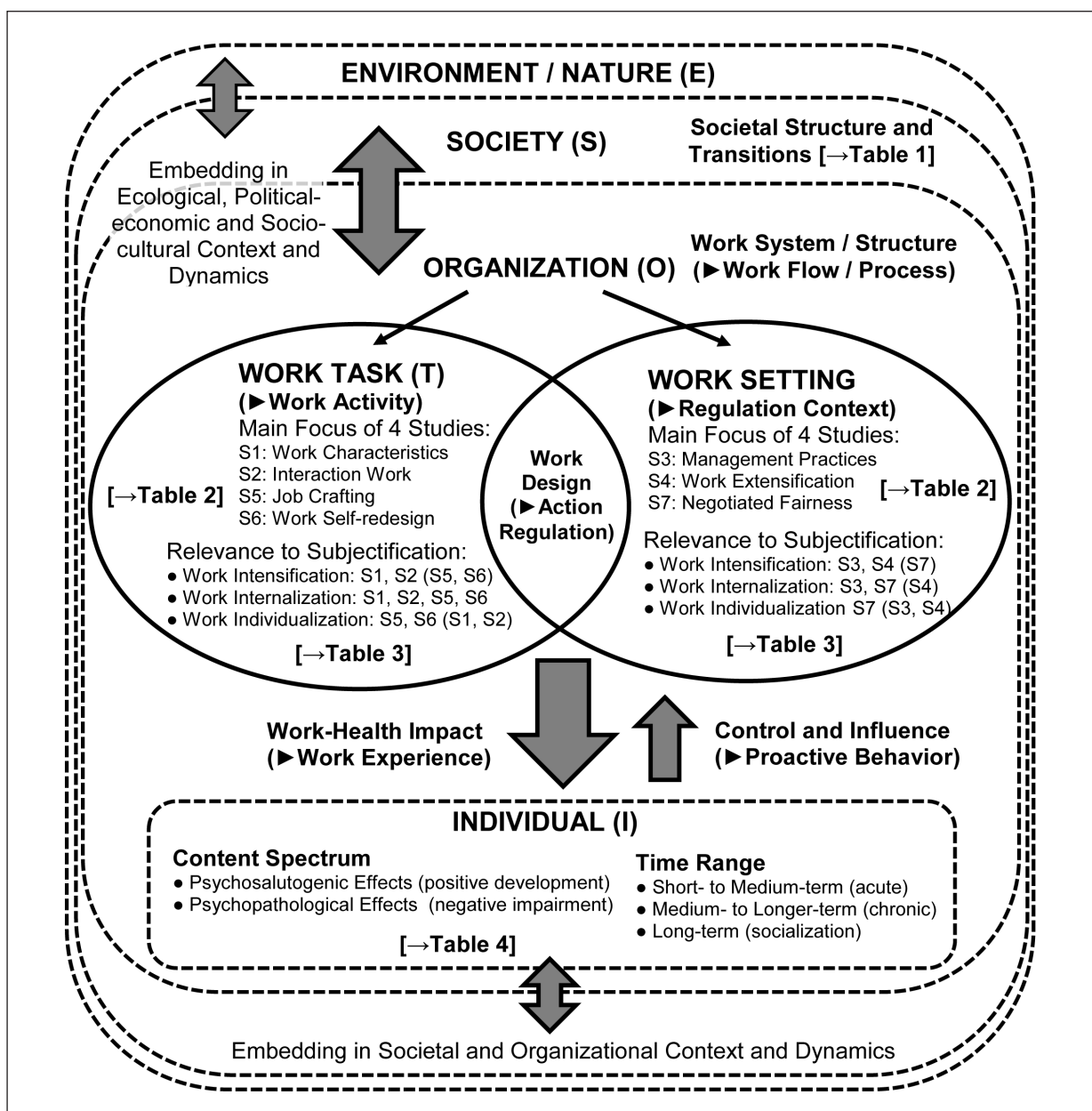


Figure 1: Overview of developed framework for synthesizing studies and organizing core results.

### 3.1 Work system structure and work process

As a framework for change, a systems-theory perspective posits dialectic relationships between work system structure and its dynamics, manifesting in antagonisms, tensions, interdependencies, and emergent properties, both within and across levels of analysis (e.g., Levins, 1998; Putnam et al., 2016; Glaser et al., 2019). The organizational-level work system (structure) and work flow (process) partly determine individual-level job features, which can be partitioned into work tasks (activity) and work setting (context). The „primacy of the work task“ puts the focus of psychological action regulation on the work activity, as distinguished from the surrounding setting, situation, or context within which these actions are performed (e.g., Büssing, 1992; Ulich, 2015). The work task–setting (activity–context) separation bears similarities with the common distinction of intrinsic (task-inherent) versus extrinsic (situation-related) job characteristics (e.g., Ryan & Deci, 2000), but carries more far-reaching activity- and systems-theoretical assumptions on dynamic interactions between work activity, acting individual, and socio-technical embedding in organizational structures (e.g., Seubert et al., 2015; Weber & Jeppesen, 2017). The task-setting (activity-context) distinction was used as an initial structuring element, based on theoretical considerations regarding possibly differential impacts of identified transitions on structure and dynamics of work systems.

### 3.2 Spectrum and range of work-health impacts

Representing a core segment of the interdisciplinary intersection between work psychology and occupational medicine, work–health impacts were conceptualized broadly and divided into psychosocial (motivational, health-preserving, personality-promoting) aspects and psychopathological health impairments (e.g., Harvey et al., 2017; Huppert, 2009; Stansfeld & Candy, 2006). This spectral categorization was combined with assumptions regarding the temporal horizon to yield a matrix of positive (psychosocial) and negative (psychopathological) manifestations of personal health, in the: a) short- to medium-term (acute), b) medium- to longer-term (chronic), and c) long-term (socialization) perspective of personality-shaping occupational impacts on the working person (e.g. Frese, 1982; Frese, Kring, Soose & Zempel, 1996; Woods, Wille, Wu, Lievens & De Fruyt, 2019). Including this frequently neglected perspective of occupational socialization corresponds with an important paradigmatic position in work psychology, owing to its humanistic roots (e.g., Weber & Jeppesen, 2017). Although relatively stable in the short to medium term, individual orientations and predispositions are as-

sumed to develop over longer periods in processes of adaptation and habitualization, eventually resulting in changes in attitudes, values, orientations and personality traits (e.g., Roberts, 2006; Weber, Unterrainer & Schmid, 2009). Some implications of this perspective become evident in the evaluation of individual differences, such as the need for autonomy and personal growth as well as trait components of depression and anxiety.

## 4 Study series (S1-S7)

Presented is a thematic analysis and conceptual integration of a series of studies, based on a developed framework of work and health in transition (see Figure 1), incorporating assumptions on tendencies towards the subjectification of work (Hornung, Weigl, Herbig & Glaser, 2021). Included are  $n = 7$  collaborative studies (S1-S7), conducted between 2015 and 2019 at university institutes of occupational medicine and psychology in Germany and Austria. All were presented as oral (S1, S5, S6) or poster (S2, S4, S7) reports at the Annual Scientific Congress of the German Association of Environmental Medicine and Occupational Medicine (55th-59th DGAUM, 2015-2019; conference proceedings in German referred to in Appendix Table A1). Further, internationally presented and published were English-language versions of all studies (two in this journal), which are referred to in the following (these studies are marked with an \*asterisk in the references section of this article). The range of investigated topics is reflected in short titles, specifically, work characteristics (S1), interaction work (S2), management practices (S3), work extensification (S4), job crafting (S5), work self-redesign (S6), and negotiated fairness (S7). Short study descriptions are provided below, followed by summaries on methods and results. Table 2 gives an overview of studies, samples, and investigated constructs.

### 4.1 Study 1: Work characteristics

The first study (S1) examines the roles of selected work characteristics as stressors and resources for action regulation (Hornung, Seubert, Weigl & Glaser, 2015). For this, it draws on action regulation theory as a framework for the conceptual–empirical integration of core assumptions of the job demands–resources model of work design and the self-determination theory of motivation. Analyses are based on path modeling, using a sample of  $N = 1,008$  tenured civil servants in a state financial administration. Independent variables are adverse and supportive work characteristics (work stressors, work-related resources) as well as individual differences in autonomy orientation. Two types

Table 2: Overview of studies and investigated constructs.

Study: Short title (sample / setting)	Independent variables	Mediating variables	Dependent variables
S1: Work characteristics ( <i>N</i> = 1,008 public administration clerks)	<ul style="list-style-type: none"> <li>- Work demands / stressors</li> <li>- Work-related resources</li> <li>- Autonomy orientation</li> </ul>	<ul style="list-style-type: none"> <li>- Intrinsic work motivation</li> <li>- Psychological irritation</li> </ul>	Organizational involvement: <ul style="list-style-type: none"> <li>- Identification</li> <li>- Alienation</li> </ul> Psychosomatic complaints
S2: Interaction work ( <i>N</i> = 1,848 geriatric nurses)	<ul style="list-style-type: none"> <li>- Patient aggression</li> <li>- Interaction control</li> <li>- Interaction competence</li> <li>- Quantitative work overload</li> <li>- Qualitative work overload</li> <li>- Social support supervisors</li> <li>- Social support colleagues</li> </ul>	Negative emotions toward patients; Forms of emotion regulation: <ul style="list-style-type: none"> <li>- Identified</li> <li>- Introjected</li> <li>- Integrated</li> <li>- Incongruent</li> </ul>	Burnout syndrome: <ul style="list-style-type: none"> <li>- Emotional exhaustion</li> <li>- Depersonalization</li> <li>- Impaired performance</li> </ul>
S3: Management practices ( <i>N</i> = 14,372 city employees)	Employee-oriented management practices: <ul style="list-style-type: none"> <li>- High-investment employment practices</li> <li>- High-involvement management practices</li> </ul>	<ul style="list-style-type: none"> <li>- Organizational and occupational identification</li> </ul>	Work Ability Index (WAI): <ul style="list-style-type: none"> <li>- Subjective WAI aspects</li> <li>- Objective WAI aspects</li> </ul>
S4: Work extensification ( <i>N</i> = 334 hospital physicians, longitudinal, 4 measurement points)	Social role conflicts: <ul style="list-style-type: none"> <li>- Work-to-family conflict</li> <li>- Family-to-work conflict</li> </ul> Personality dispositions: <ul style="list-style-type: none"> <li>- Depression as trait</li> <li>- Anxiety as trait</li> </ul>	---	Affective disorders: <ul style="list-style-type: none"> <li>- Depression as state</li> <li>- Anxiety as state</li> </ul>
S5: Job crafting ( <i>N</i> = 1,196 Chinese telecommunications employees)	Individual, interpersonal, organizational antecedents: <ul style="list-style-type: none"> <li>- Growth need strength</li> <li>- Transformational leadership</li> <li>- Situational constraints</li> </ul>	Job crafting: <ul style="list-style-type: none"> <li>- Task crafting</li> <li>- Cognitive crafting</li> </ul>	Psychological empowerment: <ul style="list-style-type: none"> <li>- Self-determination</li> <li>- Influence</li> <li>- Meaningfulness</li> <li>- Competence</li> </ul>
S6: Work self-design ( <i>N</i> = 279 employees in heterogeneous occupations)	Work self-redesign: <ul style="list-style-type: none"> <li>- Task autonomy</li> <li>- Task crafting</li> <li>- Task negotiation</li> </ul> Work characteristics: <ul style="list-style-type: none"> <li>- Task complexity</li> <li>- Task interdependence</li> <li>- Work overload</li> </ul>	---	<ul style="list-style-type: none"> <li>- Organizational identification</li> <li>- Meaning in work</li> <li>- General well-being</li> <li>- Work-life conflict</li> <li>- Work-life enrichment</li> <li>- Emotional exhaustion</li> <li>- Psychosomatic complaints</li> </ul>
S7: Negotiated fairness ( <i>N</i> = 111 employees in heterogeneous occupations)	Individual negotiation: <ul style="list-style-type: none"> <li>- Own personalization</li> <li>- Observed prevalence</li> </ul> Employment relationship: <ul style="list-style-type: none"> <li>- Procedural justice</li> <li>- Distributive justice</li> </ul>	---	<ul style="list-style-type: none"> <li>- Fairness of individual negotiation as management practice</li> </ul>

of organizational involvement (identification, alienation) and psychosomatic complaints were examined as longer-term (second-order) work outcomes. Confirmed as mediating (first-order) outcomes of work design were intrinsic work motivation and work strain (psychological irritation), reflecting short- to medium-

term positive and negative health effects. Workplace alienation was confirmed as a correlate of low motivation and high strain. As expected, autonomy orientation influenced employee responses positively. Overall, this study illustrates possibilities and potentials for a stronger integration of different theories and models



of applied psychology. Practical implications include work design interventions for removing obstacles and strengthening potentials for satisfying needs for autonomy, competence, and relatedness. Developing and applying such an integrative approach aimed at ensuring freedom of mental health impairment and positive personality development corresponds with long-standing demands of work and organizational psychology.

#### 4.2 Study 2: *Interaction work*

The second study was designed to theoretically and empirically integrate broader concepts of interaction work and professional burnout in human-oriented services (Hornung, Lampert, Weigl & Glaser, 2018). Drawing on self-determination theory, the study develops and tests an elaborate multi-phase model (interaction work, emotion regulation, support, and coping) incorporating assumptions of work psychology on influencing factors in the emotional labor process and development of occupational burnout. The sample consists of  $N = 1,848$  nursing staff working in 111 geriatric care facilities within the State of Bavaria. Independent variables in the model included patient aggression, interaction control and competence, quantitative and qualitative work overload, and social support by supervisors and colleagues. Mediating constructs were experienced negative emotions toward patients and forms of emotion regulation, classified as identified, introjected, integrated, and incongruent. Outcomes were the burnout dimensions of emotional exhaustion, depersonalization, and impaired performance. Empirical results testing this integrated model suggest that major causes of burnout are rooted in dysfunctional interaction situations, characterized by quantitative and qualitative work overload, patient conflicts, and experienced negative emotions. Functional emotion regulation strategies and social support were identified as protective factors or coping resources, relevant mostly in subsequent phases of the emotional labor process. Overall, this study provides insights into the processes of mental regulation of emotional demands and stress of interaction work—and their health effects. Practical implications include work organization to support successful interaction work, functional emotion regulation, and coping emphasizing the prevention of burnout through socio-technical design of work systems in health care.

#### 4.3 Study 3: *Management practices*

The aim of the third study was to explore paradoxical tensions between employee-oriented (progressive) management practices and work-related health (Hornung, Weigl, Höge & Glaser, 2016; see also: Hornung, Höge, Glaser & Weigl, 2017). Specifically, direct,

mediated, and interactive relationships are examined between two types of employee-oriented management practices (high-investment practices and high-involvement) and occupational health. The latter was operationalized with the work ability index, distinguishing between subjective (e.g., personal estimate, psychological resources) and objective (e.g., sick days, diagnosed diseases) aspects of work-related health. Included as a partial mediator were positive psychological states of organizational and occupational identification (operationalized broadly in terms of involvement, commitment, significance, and satisfaction). The sample was based on a large-scale employee attitude survey of public (city) employees ( $N = 14,372$ ), comprising various occupational groups, such as administrative and technical staff, educators, social and healthcare workers. Results suggest that motivational benefits of progressive management practices are also associated with intensified utilization of work capacity, confirming suspected ambivalent or paradoxical dialectic effect of employee-oriented management practices on occupational health in performance-oriented work systems. These results are interpreted as evidence for increasing relevance of self-enacted (subjectified) forms of work intensification, based on processes of occupational and organizational identification and internalization.

#### 4.4 Study 4: *Work extensification*

The fourth study investigates extensification or „boundarylessness“ of work in terms of time-based social role conflicts and their cumulative impact on mental health (Hornung, Weigl, Glaser & Angerer, 2016). The research report presents results of a long-term cohort study examining the prevalence of social role conflicts between work and family and their longitudinal relationships with self-reported symptoms of depression and anxiety in the occupational socialization of junior hospital doctors. The analyzed sample included  $N = 334$  hospital physicians, providing complete data across four measurement points over a period of almost 10 years. Independent variables included the two commonly distinguished types of (time-based) work-to-family and family-to-work conflict as well as personality (trait) dispositions towards depression and anxiety. Dependent constructs were the state components of depression and anxiety. Analyses included psychometric assessment, general and gender-specific descriptive trends, as well as longitudinal relationships between social role conflicts, measured at various points during the study, and self-reported symptoms of assessed mental health problems at the end of the investigation period. Results indicated prospective („causal“) effects of role conflicts between work and family on states of depression and anxiety over time,

notably, above and beyond the variance explained by personality dispositions (trait components) towards these mental health problems. Overall, this study underscores the need for measures and interventions to contain the work role extensification in early phases of medical careers. Efforts to increase compatibility between physician work and their personal life specifically need to address an occupational culture of excessively long working hours, widespread gender inequality, and tolerance of reduced opportunities for women to participate in the workforce according to their qualifications.

#### 4.5 Study 5: Job crafting

The fifth study operationalizes and examines the construct of job crafting as a form of proactive coping and self-empowerment at work (Hornung, 2020). Empirically tested in this study is a model of individual (growth need strength), interpersonal (transformational leadership), and organizational (situational constraints) antecedents and motivational consequences of two types of job crafting, namely, task (situation-directed) and cognitive (self-directed) modifications of work boundaries, including their differential effects on established dimensions of psychological empowerment. The sample consisted of  $N = 1,196$  employees of a telecommunications company in China, gathered in the context of an expatriate assignment. With the exception of a lacking significant path from situational constraints to cognitive job crafting, common antecedents of both task crafting (external) and cognitive crafting (internal) were confirmed. Also supported were differential motivational effects with task crafting predominantly related to control-oriented empowerment dimensions of self-determination and influence, whereas cognitive crafting was more proximal to person-oriented aspects of experienced meaningfulness and competence. Discussed theoretical and practical implications concern the active and partly ambivalent role of individuals in shaping motivational processes and conditions to fulfill work-related needs and support their psychological well-being at work.

#### 4.6 Study 6: Work self-design

The sixth study examined processes of work self-design as the exercise of individual task-related control towards improving personal quality of working life (Hornung, Höge & Rousseau, 2019). Explored are main and interactive effects of three distinct aspects of flexibility in work design and potential sources of worker control: (1) task autonomy, (2) task-directed job crafting and (3) individual task renegotiation (idiosyncratic deals). Additionally, task characteristics were investigated as controls (complexity, interdependence, over-

load). Outcomes are a battery of positive and negative indicators for the quality of working life and employee well-being and health, namely, organizational identification, meaning in work, general well-being, work-life conflict and enrichment, emotional exhaustion, and psychosomatic complaints. The sample comprised  $N = 279$  employees in different organizations and professional groups, recruited via the personal networks of students participating in a research seminar in occupational psychology. Core results indicated that task autonomy, task-directed job crafting and task idiosyncratic deals play distinct yet synergistic roles for improvement of working life. Task autonomy was the most important aspects, both in terms of main and interactive effects with task crafting and negotiation of idiosyncratic deals, specifically with respect to positive indicators of the quality of working life, such as meaning in work, organizational identification, and work-home enrichment. Based on recent conceptual developments, this study provides impulses for a broadening of perspectives in work design research with regard to the psychosocial effects of the interplay of organizational, self-enacted, and individually negotiated degrees of freedom for personalizing work activities.

#### 4.7 Study 7: Negotiated fairness

The focus of the last study was on employee attitudes regarding perceived fairness and social acceptance of individually negotiated personalized work arrangements, also called *idiosyncratic deals*, as an increasingly common and advocated management practice (Hornung, Doenz & Glaser, 2016). The reported pilot study explores influences on fairness-related attitudes towards the personalization of working conditions via individual negotiation as a post-disciplinary management practice in the context of organizational justice. The purposive convenience sample consists of  $N = 111$  employees in different organizations and occupations, gathered in a student research project. Examined as predictors were the extent of own negotiation and observed prevalence of time-based and task-based negotiated special arrangements, procedural and distributive organizational justice, and interactive effects of these factors on fairness perceptions. Overall, fairness of individualized working conditions was rated higher for developmental (task-based) idiosyncratic arrangements, especially when their occurrence is common (widespread or egalitarian). This normative influence exceeded (mediated) positive influences of own individualization and was accentuated (moderated) by procedural justice, i.e., in the context of considered, transparent, and ethical management practices. In contrast, distributive justice related inversely to fairness perceptions, suggesting that idiosyncratic deals are less accepted and legitimate when the emphasis

is on economic principles of equitable allocation of resources according to individual contributions. Theoretical and practical implications concern the analysis, evaluation, and design of potentially employee-oriented management practices in increasingly flexible work structures and individualized organizations.

## 5 Methods

Studies share common features regarding methods and contents, which facilitates aggregation, specifically, quantitative survey methodology, correlational analysis, focus on employee well-being and health, and partly overlapping theories and constructs. Next, a brief overview of the samples, measures, and statistical analyses is provided, followed by a description of the approach for the presented qualitative aggregation and interpretation.

### 5.1 Samples

All reviewed studies employed self-report survey methods, six are cross-sectional. The exception, S4 draws on a long-term longitudinal study with four measurement points; the Munich cohort study on working conditions of resident hospital physicians (Weigl, Hornung, Petru, Glaser & Angerer, 2012). S1 and S3 were conducted in different branches of the German public administration (state tax department, city employees) in connection with academic consulting projects. The occupational context of S2 is geriatric care, including nursing staff from a representative sample of elderly care homes in the State of Bavaria, gathered in a project funded by the Federal Institute for Occupational Safety and Health. Adding diversity in national and cultural settings, S5 was conducted in a telecommunications company in China, a collaboration project during an expatriate assignment. Studies S6 and S7 analyze heterogeneous convenience samples, recruited through the personal contacts and networks of research students in psychology at the University of Innsbruck.

### 5.2 Analyses

All studied constructs were measured with multi-item self-report questionnaires, psychometrically assessed for structural validity (factor structure) and reliability (internal consistency) prior to hypothesis testing. Typically, this involved combinations of exploratory and confirmatory factor analysis and examination of Cronbach's alpha coefficients (in S7, for instance, analyses were limited by sample size). All scales showed acceptable measurement properties (some of which had not been previously established). Correlational hypotheses between predictors and outcomes were

mostly tested in path or structural equation models (S1-S5). In two cases (S6, S7), multiple moderated linear regressions were used, involving tests for interaction effects (S6, S7). Statistical approaches range from manifest-variable (scale-level) path models (S1) to complete (item-level) latent-variable structural equation models (S5), including a combination of these (S2) and item parceling techniques to aggregate manifest indicators (S2, S3, S4). One of the latter studies (S3) tested interaction effects with latent variables; one (S4) used a longitudinal design with latent variables aggregating constructs across measurement points.

### 5.3 Integration

The presented summary documents a final integrating research step, based on qualitative aggregation and interpretation. In some cases, analyses were repeated or extended and arguments or theorizing were integrated. Some construct labels were changed for consistency or emphasis of parallels across studies (e.g., identification and commitment). Themed analysis involved an iterative process of theory-guided (deductive) categorizations and explorative (inductive) analyses to identify recurring topics, concepts, issues, and explanatory processes (e.g., Alvesson & Sandberg, 2020; Munro, 2012). Initially, studies were reviewed and structured according to chronological order, similarities in theories, constructs, methods, samples, outcomes, etc. Short titles, brief summaries, and content-descriptors were developed or refined. Subsequently, three thematic structuring schemes were applied: a) Work system focus distinguishes between the central role of the work task (activity) versus work setting (context); b) Subjectification of work is operationalized as primary (more proximal, direct, explicit) versus secondary (more distal, indirect, implicit) connections with identified tendencies of intensification, internalization, and individualization of work; c) Work-health impact postulates theoretical and empirical relationships with positive and negative short, medium, and long-term motivational, health-related, and personality-shaping socializing work effects. Synthesized results are reported below, structured along these categories.

## 6 Results

As outlined above, an initial distinction was made regarding the structure (process) of the work system (work flow) between the domains of work tasks (work activity) and work setting (regulation context). Directly focusing on work tasks and their psychological regulation are four studies (S1, S2, S5, S6). The other three examine broader and more general working conditions and practices, constituting the surrounding



context of action regulation (S5, S4, S7). Conceptual and empirical indications for trends of work intensification, internalization, and individualization were analyzed in both domains, considering their somewhat different perspectives. To distinguish primary from secondary references (relevance or connections) with respect to examined aspects of subjectification, a set of criteria was applied, including initial study aims and hypotheses, explicitly investigated empirical relationships, and the extent of interpretation and critical-theoretical reframing of constructs and findings. For instance, inclusion of time pressure, work overload, or

work-family conflict in a study was taken as a strong indication for work intensification; constructs of occupational, professional or organizational identification were counted as internalization, and a focus on proactive job changes as direct reference to individualization. Accordingly, primary or direct references to intensification were found in four studies; five studies explicitly examine internalization processes; three emphasize the individualization of work organization. All share more or less pronounced secondary (indirect, distal, theoretically construed) implications for the other respective aspects of subjectification. Secondary

Table 3: Relationships of studies to subjectification aspects.

Study# (focus): Short title – extension	Work intensification	Work internalization	Work individualization
S1 (T): Work characteristics – as stressors and resources for action regulation	X = work stressors (overload) as predictors; psychological irritation, and psychosomatic complaints as outcomes	X = core internalization constructs as outcomes; intrinsic work motivation, organizational identification / alienation	(x) = includes differences in individual autonomy orientation as interaction of personality and occupational socialization
S2 (T): Interaction work – and professional burnout in human-oriented services	X = quantitative and qualitative work overload as predictors of dysfunctional emotion regulation and impaired mental health	X = forms of emotion regulation based on degree of psychological internalization of occupational and organizational norms	(x) = individual differences in interaction competence and control, and coping based on person-specific emotion regulation patterns and resources
S5 (S): Management practices – and paradoxical tensions with employee health	X = ambiguous positive (mediated) and direct (negative) effects of high-involvement management on work ability suggest intensification	X = organizational and occupational identification as mediator between perceived management practices and work ability	(x) = progressive high-involvement management practices support individualization; customized benefits in high-investment practices
S4 (S): Work extensification – as social role conflicts and mental health impact	X = focus on long-term effects of work-to-family and family-to-work conflict on affective disorders	(x) = prioritization of work over family; conflicts typically at expense of obligations activities in non-work domain	(x) = inclusion of gender-specific patterns and trends in individual use of part-time work arrangements over time
S5 (T): Job crafting – as proactive coping and self-empowerment at work	(x) = situational constraints as antecedents of crafting as coping; performance-orientation in transformational leadership as antecedent	X = cognitive and task job crafting as psychological strategies of active self-motivation; empowerment examined as outcome	X = focus on task and cognitive job crafting as self-enacted individual modifications of external and internal work boundaries
S6 (T): Work self-design – as exercise of control to improve quality of working life	(x) = work overload included as control variable; work-life conflict and psychosomatic complaints as outcomes	X = organizational identification, meaning in work, well-being, and work-life enrichment as core outcomes	X = focus on interplay of work design-based, crafted, and negotiated forms of personalizing of work tasks
S7 (S): Negotiated fairness – of personalized work arrangements as management practice	(x) = performance-orientation and rationalization aspect of individual negotiation as management practice	(x) = normative and justice-related predictors of social acceptance of management practice as aspects of internalization	X = managerial focus on individual negotiation (idiosyncratic deals); fairness of individualization as outcome

Notes: T = focus on work task / activity; S = focus on work setting / context; X = classified as primary (proximal, direct, explicit) references / connection to the respective aspect of subjectification; (x) = classified as secondary (distal, indirect, implicit) references / connections.

connections entail more intensive critical re-interpretation and conjectures and should be viewed cautiously and tentatively. Primary and secondary references of studies to subjectification aspects are summarized in Table 3. Short-, medium- and long-term work-health impacts are presented below in Table 4.

### 6.1 Subjectification focus on work task

Two core studies focusing on the work activity and its psychological regulation are: a) the investigation of positive and negative effects of work characteristics as supportive or hindering factors in action regulation according to the job demands-resources model in S1; b) the modeling of factors influencing emotional regulation and work-related health in interactive work in human services in S2. Both emphasized work intensification (time pressure, excessive demands) and internalization processes (organizational and professional identification). Two other studies directly refer to work tasks (S5, S6), examining processes of psychological internalization (work motivation, identification, meaning) from an individualization perspective: c) influencing factors and motivational effects (psychological empowerment) of processes of self-regulation and task modification are the focus of S5; d) as follow-up, S6 examines proactive self-design of work and implications for the quality of working life, focusing on interactive effects of different forms of task-related control and influence.

### 6.2 Subjectification focus on work setting

Altogether three studies focus on the work setting as the situational context of action regulation, emphasizing intensification, internalization, and individualization to different degrees. In S3, in investigating ambiguous effects of employee-oriented management practices on work ability, both internalization and intensification processes were hypothesized and supported. In S4, the focus was also on processes of work intensification (or extensification) with long-term effects of social role conflicts between work and family on affective disorders (depression, anxiety). Part-time work introduced an individualization aspect, prioritizing work an internalization component. Individualization was the theme of S7, examining determinants of fairness perceptions of personalized working conditions. Indirectly this study also concerns internalization (attitudes towards individualization, social acceptance) and intensification (increased demands and efforts), constituting potential side-effects of individual negotiation as management practice, which implies performance-orientation and rationalization aspects.

### 6.3 Psychosalutogenic work-health impact

The matrix model differentiating spectrum and range of work-health impacts is shown in Table 4 and includes an exemplary structuring of study outcomes along these categories. In theory, positive (psycho-

Table 4: Matrix of spectrum and range of work-health impacts.

	Short- to medium-term (acute)	Medium- to longer-term (chronic)	Long-term (socialization)
<b>Psychosalutogenic work-health impact</b>	Intrinsic work motivation (S1) Work-life enrichment (S6) Fairness perceptions (S7) (e.g., positive affect / joy)	Organizational identification (S1, S3, S6) Work ability (S3) Psychological empowerment (S5) Meaning in work (S6) General well-being (S6)	Autonomy orientation (S1) Interaction competence (S2) Functional emotion regulation (S2) Growth need strength (S5)
<b>Psychopathological work-health impact</b>	Psychological irritation (S1) Negative emotions (S2) Work-life conflict (S6) (e.g., job dissatisfaction) (e.g., perceived injustice)	Organizational alienation (S1) Occupational burnout / Emotional exhaustion (S2, S6) Psychosomatic complaints (S1, S6) State depression / anxiety (S4)	Dysfunctional emotion regulation (S2) Trait depression / anxiety (S4) (e.g., external causality orientation / locus of control) (e.g., learned helplessness)

Notes. Exemplary structuring of study outcomes along spectrum (positive / negative) and time range (acute, chronic, socialization) of work-health impacts; S1-S7 = Study including the respective outcome; constructs in parentheses not included in the studies, but added only for illustrative purposes.

salutogenic effects on well-being and health are connected to processes of psychological identification with one's work, internalization of work-related norms and goals, and opportunities for the need-based personalization of work arrangements. Reviewed studies generally support these assumptions. Among the short- to medium term acute responses are positive affect, intrinsic work motivation (S1), but also episodes of work-life enrichment (S6), and fairness perceptions (S7). More chronic responses in the medium- to longer term include organizational and occupational identification (S1, S3, S6), psychological empowerment (S5), meaning in work, general well-being (S6) and work ability (S5). Long-term socializing developments apply to personality constructs, which were included as independent variables, such as autonomy orientation and growth need strength (S1, S5), as well as interaction competence and functional emotion regulation patterns (S2).

#### 6.4 Psychopathological work-health impact

Psychopathological work effects impairing occupational well-being and health are widely acknowledged to be associated with intensification processes, manifesting, for instance, in increased demands and performance pressure, contributing towards quantitative or qualitative work overload. In the short to medium term, typical employee responses include the experience of negative emotions (S2), psychological (cognitive and emotional) irritation (S1), as well as, for instance, job dissatisfaction and perceptions of injustice (not included in the summarized studies). Prototypical medium-term effects are the occupational burnout syndrome (S2), respectively its core component emotional exhaustion (S6), but also psychosomatic complaints (S1, S6) and affective disorders, such as symptoms of depression and anxiety (S4). Long-term negative socialization effects can be exemplified by patterns of reduced autonomy orientation (control rejection, learned helplessness) and chronic work and organizational alienation (S1), dysfunctional emotional regulation (S2), and trait components of depression and anxiety (S4). Although some indication was found for potential psychopathological side-effects of organizationally desirable employee involvement and proactivity, this perspective emerged during the course of the study series and its integration and was not systematically developed in all studies a priori, thus, mandating cautious interpretation and additional future research.

## 7 Discussion

This critically themed research summary contributes to previous and broader efforts to systematically integrate the sociological perspective of the subjectification of work with theorizing and results in applied psychological research, specifically with regard to more comprehensive approaches to occupational well-being, health, and socialization (Höge, 2011; 2019; Höge & Hornung, 2015; Hornung & Höge, 2019). It was designed as an integrative, critical-theoretical re-interpretation, specifically, a qualitative meta-study emphasizing tendencies of work intensification, individualization, and internalization as important facets of subjectification. A series of quantitative studies, conducted collaboratively between research institutions in applied psychology and occupational medicine over a period of five years, was structured and re-interpreted in an iterative deductive-inductive analytic approach. In addition to distinguishing different domains, structures, and dynamics of work systems and processes, the developed framework draws on and builds connections with the sociological and interdisciplinary literature on the subjectification of work, advanced neoliberal governmentality, and new forms of indirect control through responsabilization and self-management (e.g., Bredehöft, Dettmers, Hoppe & Janneck, 2015; Moldaschl & Voß, 2002; Rose, O'Malley & Valverde, 2006). Interpreted against the backdrop of theorizing on organizational paradoxes (e.g., Glaser et al., 2019; Putnam et al., 2016), identified tensions point toward somewhat ambiguous implications of motivational work design and the personalization of work tasks and contextual factors. Arguably, these are aggravated when employees simultaneously internalize progressively expansive and intrusive organizational (occupational, societal) expectations, requirements, and norms. Specifically, this points to the potentially health-damaging effects of self-directed forms of work intensification (e.g., Burchell et al., 2002; Dettmers et al., 2016; Höge, 2019; Korunka & Kubicek, 2017). Theoretically plausible and sporadically observed empirical links between internalization of organizational (performance-related) goals and behavior-based (self-directed) intensification correspond with the subjectification-proposition in work sociology. This perspective stresses the relevance of self-endangering work behavior as harmful, interest-based „self-exploitation“, facilitated through manipulative instruments and technologies of indirect control (e.g., goal setting,

incentives), energized in the broader context of increasing job and income insecurity, as well as „externalization“ of social costs and risks into the individual sphere of responsibility (e.g., Pedaci, 2010; Pongratz & Voß, 2003; Wacquant, 2009; Weiskopf & Loacker, 2006). From a systemic perspective, it is understood that identified tendencies of the subjectification of work are not independent, but interdependent, intersecting, and interacting in „synergistic“ ways towards their observed psychological impacts (e.g., Levins, 1998; Terborg, 1981).

Psychological tensions or force-fields of the three subjectification tendencies of intensification, internalization, and individualization were analyzed initially on a conceptual basis and synthesized study results were subsequently explored for indications (e.g., paradoxical effects of employee-oriented management on work ability in S5; a positive correlation between task crafting and work-life conflict in S6). The dialectics between intensification and internalization in particular, are arguably most common and controversial, relating to issues of conflict and convergence of interests in employment (i.e., unitarism vs. pluralistic perspectives) that are underemphasized, neglected or even repressed „blind spots“ in applied psychology as well as in occupational medicine (e.g., McDonald & Bubna Litic, 2012). Work intensification, in the form of externally mandated increases in performance demands, would likely trigger resistance and thus possibly be counterproductive to employee commitment or identification with the organization. Internalized (subjectified) work intensification and flexibility, however, are exercised in more „organic“ ways through self-control, thus bypassing protective mechanisms of (individual and collective) employee reactance or resistance (e.g., Hornung & Höge, 2021; Pérez-Zapata et al., 2016; Pongratz & Voss, 2005). Thus, integrating theory and data, this review suggests the need for increased attention to tensions between the (intrinsically motivating) personalization of work, associated employee identification with inherently expansive organizational and occupational performance requirements and the potentially health-damaging effects of resulting self-enacted work stressors. Importantly, this perspective was not systematically incorporated a priori in the reviewed study series, but was developed and inferred post-hoc, and is hereby recommended as a framework for further exploration, application, and elaboration.

To keep up to date and adequately represent the complex and dynamic interrelationships between work and health, applied psychology and related disciplines, such as occupational medicine, need to revisit and revise some basic assumptions on the motivational basis of work behavior (e.g., Ryan & Deci, 2000). Specifically, considering research in the social sciences on processes of subjectification and governmentality in

post-disciplinary work regimes, this concerns issues of voluntariness, freedom of choice, and individual agency (e.g., Becke, 2017; Moldaschl & Voß, 2002; Pyysiäinen et al., 2017). Increasingly relevant and „at work“ here, are modes of indirect control through internalized performance norms and psychologically coercive or harmful forms of self-management (e.g., Bredehöft et al., 2015; Laurence et al., 2016; Pérez-Zapata et al., 2016). The „subjectified intensification“ of work is contextualized within a systematic erosion of institutional and social protective factors (e.g., employee rights, labor unions) through tendencies of flexibilization, individualization, and precarization at the level of organizations and employment relationships, as well as through the neoliberal deconstruction of public social and healthcare systems more broadly (e.g., Pedaci, 2010; López-Andreu, 2019; Moscone et al., 2016; Wacquant, 2009). Against the „background pressure“ of high insecurity, tendencies of work intensification, internalization, and individualization need to be critically evaluated as logics underlying workplace regimes of indirect control through the individualization and subjectification of risks and responsibilities in employment (e.g., Hornung & Höge, 2021). Theoretical implications of the above discussed developments include the need for a more systematic and encompassing (holistic) integration of socio-cultural influences and trends into psychological models of work. For instance, to better contextualize and embed the study of workplace phenomena within broader, overarching developments, the OTI framework (Büssing, 1992), drawn on in this study, needs to be conceptually elaborated. Such an extension should not only account for societal embeddedness in political-economic and socio-cultural structures and transitions (e.g., Bliese et al., 2017), and associated interactions among society, organizations, work tasks and activities, and the working individuals, but it further needs to include ecological embeddedness in the natural environment, crucial to addressing some of the most pressing problems threatening human civilization today. Future research devising and applying such an extended (i.e., Environmentally [E] and Societally [S] integrated or embedded, „ES-OTI“) approach, systematically including interactions among the work system, society, and environment, seems timely and called for, evidenced for instance, by a growing literature on critical sustainability and related concepts in other fields (e.g., Fuchs, 2017; Rose & Cachelin, 2018). For research in applied psychology, the framework sketched out here (summarized in Figure 1) can serve as a platform for such broader theoretical and empirical undertakings, necessary to further develop the fundamentally socially critical, profoundly humanization-oriented, epistemologically reflexive, and interdisciplinary approach suggested and exemplarily explored here.

At present, the prospects for such a critical perspective may be improving, partly due to proliferation of disillusionment with the increasingly unconvincing ideological accounts and interest-guided interpretations dominating the mainstream. A recent case in point, Ergene, Banerjee, and Hoffman (2021) have forcefully argued that necessary changes in academia require no less than a fundamental reform of consciousness, mandating paradigm shifts in several domains of organizational scholarship. Specifically, according to these authors, called-for paradigm shifts involve (1) transitioning from the system-justifying managerialist mainstream to socially critical and transformational perspectives; (2) from narrow, discipline-focused, and abstract to integrative, interdisciplinary, and applied research; (3) from realist and reductionist to more relational and holistic theories of knowledge; and (4) from a counterfactual and unreflected pretense of objectivity and value-neutrality to a more transparent and openly stated stance of engaged scholarship, based on strong commitments to ethical principles and collective societal interest in the common good. Accordingly, engaged scholarship aims at reconciling and leveraging the authoritative normative and knowledge-based position and processes of science to facilitate necessary „social change by aligning research, teaching, and service activities with social and environmental justice and ecological wellbeing.“ (Ergene et al., 2021; p. 1328). These envisioned changes towards critical scholarly activism for the fulfillment of shared societal objectives and social responsibilities of academic institutions, strongly resonate with calls to strengthen the prosocial and emancipatory impact of humanization-oriented psychological research in organizations (Weber et al., 2020). Accordingly, this contribution aspires to address aspects captured in several of the described paradigm shifts. Moreover, it hopes to inspire more fundamentally and socially critical scholarship in applied psychology, advancing the suggested critical-theoretical and humanist perspective, which still lacks traction against the functionalist (performance-oriented) mainstream. After a substantial assessment, McDonald and Bubna Litic (2012) concluded that the field of social psychology applied to work and organizations is particularly uncritical and ideological compared to adjacent disciplines, lacking methodological and theoretical reflexivity, pluralism, and moral-ethical grounding. A decade later, this situation remains largely unchanged – and mostly even unacknowledged (e.g., Bal & Dóci, 2018). This „arrested development“ pragmatically demonstrates serious need for more radical engagement and transformation of the field. Limitations notwithstanding, the present attempt at critical synthesis suggests that at least latent potentials for social critique can be found in applied psychological research.

## 8 Conclusion

Conclusions drawn from this problematizing summary of studies reinforce the demand that humanization-oriented work and organizational analysis and design needs to devise consciously targeted efforts to contain, compensate, and counteract the mutual reinforcement of identified socially and psychologically harmful or dysfunctional tendencies associated with the neoliberal transformation of contemporary workplaces (e.g., Bal & Dóci, 2018; Hornung & Höge, 2019, 2021; Weber et al., 2020). To this end, in both academic and practical outreach, occupational psychology and medicine must become more effective, established, and accepted as ethical institutions and advocates of social responsibility. Transcending conventional disciplinary, organizational, and administrative boundaries, this involves speaking inconvenient „truth to power“ and actively standing in for the interests and well-being of workers as the main constituents. Paradoxically, employees need to be protected not only from „raw“ economic pressures and diverging interests underlying employment, but also from their own proactive compliance and collusion in the form of internalizations that are psychologically reproducing these demands. In the terminology of occupational science, threats to health and well-being arise not only from the „exposition“ to physiologically and psychologically adverse or suboptimal conditions at work, but also indirectly, through the psychological „imposition“ of (introjected, incentivized) external expectations and interests. Associated processes of subjectification do not facilitate or support humanistic ideals of self-actualization and authenticity, but rather demand continuous economic self-objectification and discipline of the working subjects. For applied psychology, this shift mandates critical reflection on criteria for evaluating work, such as freedom from health impairment, but also regarding implications for normative concepts of genuinely psychologically healthy and socially desirable personality development through everyday work activity. These concepts can no longer be treated as more or less „empty signifiers“, subject to particular interest-guided interpretations for instance, aimed at creating the appropriate individual to serve economic purposes through self-valorization, as evidenced in concepts of workplace learning, proactivity and employability, but need to be grounded in solid moral and ethical foundations that account for escalating social and environmental crises confronting the planet and the human species today.



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## Appendix

*Table A1: Study documentation as interdisciplinary collaboration and outreach to occupational medicine.*

### **Study 1: Work characteristics – as stressors and resources for action regulation**

Hornung, S., Weigl, M. & Glaser, J. (2016). Das Stressoren-Ressourcen Modell der Arbeitsgestaltung und die Selbstbestimmungstheorie der Motivation: Eine konzeptuelle und empirische Integration (The job demands-resources model of work design and self-determination theory of motivation: a conceptual and empirical integration). Oral presentation: 11.05.2016; Dokumentationsband 56. DGAUM Jahrestagung (S. 442-445).

### **Study 2: Interaction work – and professional burnout in human-oriented services**

Hornung, S., Lampert, B., Weigl, M. & Glaser, J. (2018). Emotionsarbeit und Burnout bei Altenpflegekräften: Ein arbeitspsychologisches Phasenmodell (Emotional labor and burnout in geriatric care: a phase model from work psychology). Poster presentation: 08.03.2018; Dokumentationsband 58. DGAUM Jahrestagung (S. 404-407).

### **Study 3: Management practices – and paradoxical tensions with employee health**

Hornung, S., Weigl, M., Höge, T. & Glaser, J. (2015). Arbeitsfähigkeit im Öffentlichen Dienst: Paradoxien partizipativer Managementpraktiken (Work ability in the public service: paradoxes of participatory management practices). Oral presentation: 20.05.2015; Dokumentationsband 55. DGAUM Jahrestagung (S. 326-329).

### **Study 4: Work extensification – as social role conflicts and mental health impact**

Hornung, S., Weigl, M., Glaser, J. & Angerer, P. (2016). Rollenkonflikte zwischen Arbeit und Familie und psychische Gesundheit in der beruflichen Sozialisation von Krankenhausärzten: Ergebnisse einer Kohortenstudie (Role conflicts between work and family and mental health in the occupational socialization of hospital physicians). Poster presentation: 09.03.2016; Dokumentationsband 56. DGAUM Jahrestagung (S. 551-554).

### **Study 5: Job crafting – as proactive coping and self-empowerment at work**

Hornung, S. & Weigl, M. (2017). Selbstausgestaltung von Arbeit und psychisches Wohlbefinden: Voraussetzungen und Auswirkungen aufgabenbezogener und kognitiver Modifikationsstrategien (Self-redesign of work and psychological well-being: antecedents and consequences of task-directed and cognitive modification strategies). Oral presentation: 15.03.2017; Dokumentationsband 57. DGAUM Jahrestagung (S. 53-56).

### **Study 6: Work self-design – as exercise of control to improve quality of working life**

Hornung, S. & Höge, T. (2018). Tätigkeitsspielraum, Selbstausgestaltung und individuelle Aushandlungen als Quellen von Kontrolle in der Arbeit: Zusammenhänge mit der Qualität des Arbeitslebens und Mitarbeitergesundheit (Task autonomy, self-redesign, and individual negotiation as sources of control at work: relationships with quality of working life and occupational health). Oral presentation: 08.03.2018; Dokumentationsband 58. DGAUM Jahrestagung (S. 260-265).

### **Study 7: Negotiated fairness – of personalized work arrangements as management practice**

Hornung, S., Glaser, J. & Weigl, M. (2019). Gerechtigkeitsbezogene Einstellungen von Beschäftigten zur Individualisierung von Arbeitsbedingungen – eine Pilotstudie (Fairness-related attitudes of employees concerning the individualization of working conditions – a pilot study). Poster presentation: 22.05.2019; Dokumentationsband 59. DGAUM Jahrestagung (S. 394-397).

### **Meta-study: Work and health in transition – from the perspective of subjectification of work**

Hornung, S., Weigl, M., Glaser, J. & Herbig, B. (2021). Wandel der Arbeit zwischen Intensivierung, Individualisierung und Internalisierung: Eine Integration von Beiträgen zur Arbeitsmedizin aus der Angewandten Psychologie (Transitions of work between intensification, individualization, and internalization: an integration of contributions to occupational medicine from applied psychology). Virtual poster presentation: 04.09.2020; Dokumentationsband 60. DGAUM Jahrestagung (S. 302-305).

*Notes: Presentation and documentation of studies at the Annual Meeting of the German Society for Occupational Medicine and Environmental Medicine (Deutsche Gesellschaft für Arbeitsmedizin und Umweltmedizin, DGAUM); proceedings available online for download: [www.dgaum.de](http://www.dgaum.de)*

# Reflection and reflexivity as valuable tools for critical Work and Organizational Psychology (Commentary on Hornung et al.)

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In their very prudent article „Social transitions of work and health from the perspective of subjectivity: Critical synthesis of selected studies from applied psychology“, Hornung et al. deal with paradoxes of the modern world of work and exemplify why and how a critical perspective on one’s own research is important and necessary to face pressing issues and challenges often overlooked, such as the neoliberal transformation of work, power relations, externalized and introjected harms of work to health and wellbeing, and social as well as environmental crises. The article is very well-structured and the arguments are set up with tact, which is especially important since the concepts presented (subjectification of work as intensification, internalization, individualization) are not common for traditional work and organizational psychology (WOP), and neither are critical perspectives.

The contribution is outstanding for at least three reasons. First, the authors selected seven of their own research studies published earlier and dared to take an in-depth look by critically reflecting on them. For their critical reflection, they drew on and integrated interdisciplinary work, borrowing the sociological concept of „subjectification of work“ (Weiskopf & Loacker, 2006), referring to processes of intensification, internalization, and individualization. The introduction and incorporation of concepts which are not familiar in applied psychology (i.e., subjectification of work) has been accomplished thoughtfully and shows how concepts from other disciplines can be harnessed for WOP. Critical reflection on research projects (before, during or after) is not common in WOP. The premise is to be „objective“, research should be „value-free“ but critical reflection undermines this required „objectivity“ and „neutrality“, as it is seen as subjective and value-laden (Lefkowitz, 2008). However, in fact, research can never be neutral, objective, or value-free (Kurtines, Alvarez & Azmitia, 1990), which is why researchers should accept and be aware of their own values, belief systems, contexts etc., as these are likely

to influence own research activities (Seubert, McWha-Hermann & Seubert, 2022). This in-depth look therefore is notable as it shows a way how to engage in reflection of one’s own research. Second, Hornung et al. applied a qualitative methodology – a narrative and hermeneutic approach – for their meta-study, which is hardly ever used in WOP because of the dominance of the positivist tradition and quantitative methodology in WOP (Gerard, 2016). Deviating from mainstream WOP, this article clearly shows the potential of qualitative research by making visible tendencies of intensification, internalization, and individualization in published, quantitative studies that could have been only disclosed in a qualitative analysis. The methodology may also inspire researchers in critical WOP on how to use qualitative research methodology for their own purposes as this is often neglected in university curricula (Mey & Mruck, 2020). Third, to analyze the studies with very different foci and topics, the authors developed a framework, relying on the so-called organization-task / activity-individual (OTI) approach by Büssing (1992). Although the framework seems to appear complex at first glance, it impressively illustrates the importance of contexts and their interrelatedness, which is often overlooked in (especially quantitative) research (Johns, 2006). The framework offers guidance for other researchers to engage in critical analysis of their own research but is open for further development and may guide researchers to start reflection on their own. Indeed, stimulation of critical perspectives in applied research is one of the main aims of this valuable paper and the authors have succeeded on that very well.

I would like to echo this call for critical thinking by emphasizing reflection and reflexivity as suitable tools towards critical WOP (Seubert et al., 2022). While the terms reflection and reflexivity are interrelated and thus are often used interchangeably, there are important differences (Mann, 2016). According to Bolton and Delderfield (2018, p. 9),

reflection is in-depth review of events ... . It is to bring experiences into focus from as many angles as possible ... . Seemingly innocent details might prove to be key; seemingly vital details may be irrelevant. Reflection might prove something thought to be vital to be insignificant, or lead to insight about something unnoticed at the time, pinpointing perhaps when the seemingly innocent detail was missed.

In Hornung et al.'s meta-study, one can see in a striking way how such a process of reflection from a different perspective, namely from the viewpoint of subjectification of work, reveals previously seemingly irrelevant or subordinate processes of intensification, internalization, and individualization that were not in the foreground in the original studies. This is important as it offers new perspectives on existing research, shedding light, for example, on unintended impacts of research studies in practice (e.g., effects of processes of subjectification on working people), which may lead to the inclusion of a broader range of perspectives in everyday practice and thus contribute to a better world over time (Ng, Wright & Kuper, 2019).

Reflexivity, on the other hand, goes further, back to oneself, referring to a narrower focus on self-awareness (Mann, 2016). According to Bolton and Delderfield (2018, p. 10),

reflexivity is finding strategies to question our own attitudes, theories-in-use, values, assumptions, prejudices and habitual actions; to understand our complex roles in relation to others. ... To be reflexive is to examine, for example, the limits of our knowledge, of how our own behaviour plays into organisational structures counter to our personal and professional values, and why such practices might marginalize groups or exclude individuals.

Although not explicitly elaborated in Hornung et al.'s article, a reflexive component can be inferred (at least) with regard to the collaborative work by the first author (e.g., Hornung, Höge & Unterrainer, 2021), even if such a perspective still seems rare in the field of WOP as a whole. By tracking research foci and study aims of this researcher's publications in the reference list over time, a clear change (or evolution) from more traditional to critical WOP can be observed, which plausibly may mirror a reflexive process of the author challenging his own attitudes, (personnel and professional) values, assumptions, and belief systems. Engaging in processes of reflexivity is challenging, a „near-impossible adventure of making aspects of the self strange“ (Bolton & Delderfield, 2018, p. 10). However, the potential of reflexivity lies in the recognition of one's own position in the world and a readjustment

in alignment with one's own values. By standing up for this position in society, a long-term change of societal structure, norms, and values is promoted, leading to better everyday practice over time (Ng et al., 2019).

Even though researchers in the field of WOP are rarely trained in processes of reflection and reflexivity, I warmly recommend daring the adventure of engaging in reflection and reflexivity to face pressing global issues (e.g., social and environmental crises), not only professionally as researchers but also privately as citizens. A first step towards critical reflection and reflexivity in WOP could be a confrontation with relevant literature (some of which are cited here) and to look for good examples that can be used to guide own efforts. The article by Hornung et al. could be a helpful starting point in this regard.

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# Field theory revisited – Explaining the development of an organizational network by dynamic simulation of psychological field<sup>1</sup>

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## ABSTRACT

The following contribution is about a method, which uses modelling and simulation in the context of action research. Long and complex projects shall be supported with well-founded dynamic models and simulation of possible developments in the project. The method is described exemplarily in the context of a major research project developing a network of competences. It's goal is to design a distribution platform for current and innovative qualification programs and services in the car industry, such as on-the-job tutorials for machine operatives or courses on new body part materials. The method of supporting the project by modelling and simulation based on qualitative data is described, exemplary results are discussed and hints for further research are given.

## Keywords

Innovation networks – simulation – motivation – cooperation – complexity

## 1 Introduction

### 1.1 Aim of the research

The following contribution is about a method, which uses modelling and simulation in the context of action research. Long and complex projects shall be supported with well-founded dynamic models and simulation of possible developments in the project. The method is described exemplarily in the context of a major research project. It's goal is to design a distribution platform for current and innovative qualification programs and services in the car industry, such as on-the-job tutorials for machine operatives or courses on new body part materials. This information shall be available for learners in small and medium sized enterprises, which are connected in a value chain with large advanced car manufacturers. The practical impact is a quicker distribution of knowledge about new manufacturing methods and tools to the local suppliers by a so called network of competences. This network shall work and grow autonomously after a starting period. The core concept is a market place. All kinds of education services and tools which are useful

for the goal of the network shall be distributed through this market place with guaranteed high quality. The development of real as well as virtual market places varies extremely between dynamics like early ebay or a rather stabile business like those on the Ponte Vecchio in Florence. The goal of the specific research described in this contribution is to develop a dynamic simulation model for this market place. The purpose of modeling and simulation is to find out which variables must be triggered so that the market place develops positively, and how the motives of participating stakeholders must interact for a dynamic development. The market place and its content should grow, comprise actual and useful knowledge for the learners and enterprises, and it should be to a high didactical standard. The dynamic and interdependent development of the market place organization and the motivation of the market place participants and other stakeholders play a central role in this process. Their interaction has a strong influence on market place quality.

The contribution explains how modelling and simulation can be used here as action research and project management tool for several purposes: They help to identify possible helping and hindering

<sup>1</sup> This paper is about results of the project PLUG+LEARN – Adaptable and marketplace-based competence network for the automotive and supplier industry (funded by the German Federal Ministry of Education and Research).

forces for a positive development and to analyze their influence. Simulation shall generate hints for measures supporting the positive development of the market place and helps to assess long term and side effects of possible decisions and strategies in a specific project. This simulation method will be especially suitable for modelling and simulation in projects with few participants and singular conditions and tasks. In long term projects is it not completely clear from the beginning which aspects become important because they depend from a framework of economical, technical and psychological variables, which can change over years. Therefore the classical idea to define a set of variables and to measure them through the whole project often not works for finding out relevant factors in long term change and innovation projects. On the other hand many qualitative data can be collected in such projects. The core idea of the method is to develop a model from a dynamic qualitative data base and to use this information for the continuous optimization of a modelling and simulation process accompanying the project. The possible simulation results have heuristic character. They describe the dependencies between activities and consequences for possible configurations of the network, for different decisions about the structure of the network and for different external influences. Simulations of this type broaden the knowledge about possible alternatives in proceeding during a process and provide for a better understanding of possible side-effects and dynamic long-term developments (Riedel et al., 2009; Dörner, 1996). The main steps of this method are in our case:

- Developing a basic structure of the theoretical state of the art,
- description of the rules for the system's dynamics based on simple and updated assumptions of classical field theory (Lewin, 1947),
- investigation of the specific motivation and mental models of the agents,
- development and application of a method to derive variables and parameters for the concrete project,
- simulations of possible developments of the specific innovation or change process under different possible conditions.

The application will be described for an exemplary feasibility study for the education services network. So the theoretical background is related to competence networks, market places and psychological factors influencing their development. Steps of this method are applied in the design processes of the market place for educational services. It will be shown exemplarily how this works for two core problems for a successful market place solution.

## 1.2 State of the art – old theories for new solutions

The first step is to propose a structure for the simulation of a specific process. To do this in our case, actual research on basic assumptions about structure and dynamics in competence networks must be checked. There exists research about the concept of 'networks of competence' and descriptions of existing projects and literature on success factors of networks with similar goals especially in the field of R & D. Most of the empirical research is about success factors in general either based on questionnaires (Olsen et al., 2014; Schött & Jensen, 2014; Gebreeyesus & Mohnen, 2013) or qualitative single case studies (Li et al., 2010; Liu et al., 2015; Häntsch & Huchzermeier, 2016; Chung & Leung, 2005). Beside the economical, technical and infrastructural quality the psychological success factors described here are trust (Gulati, 1995), and relationship quality (Borgatti et al., 2009). According to research about cooperation in complex long term projects mental models are useful which base on core concepts built up on shared mental models (Espinosa et al., 2001) and specific methods to generate them in specific methodological processes (Schönwandt et al., 2009). Theories about the structure of organisational networks make assumptions about different types of single persons, groups and organisations. They are promoting such projects in different roles as stakeholders with different interests (e.g., Sharma & Kearins, 2011; Dähne & Heisig, 2019). There exist core assumptions in most of these models: The networks are promoted by *stakeholders* following their specific interests. They can take certain *roles* and promote networks in a different way (Dähne et al., 2019). Cognitive, emotional and economical *ressources* of the stakeholders influence their success. These factors change during the project, motivated by changes in organization, by critical incidents, by own and other stakeholders' activities and their results. There exist important psychological influences on the development (commitment, trust, shared mental models) of a change or innovation process.

Besides these assumptions on network structures until now there exist no elaborated models on the process of network development which describe the role of dynamic psychological factors for the growth and success of networks. Also there are no proposals what to do to support the motivation of the stakeholders throughout the process. The psychological theories about the motivating effects of objects and occurrences are based mainly on the ideas of Kurt Lewin. Therefore the proposed simulation of the developments of incentives is based upon classical work of Lewin (1969), Gibson (1977) and Norman (1988) and their concept of affordance or „Aufforderungscharakter“ (Lewin, 1969). Norman



(1999) distinguishes between objective affordances of an object and subjective affordances which work as an incentive for a specific person with a specific goal in a specific situation. For the design of the market place and other organizations we propose to define objective affordances as features of explicit objects and formal rules for activities to influence an activity or emotion to reach a sustainable development of the organization. The specific affordance for the stakeholder describes the intensity and quality of the incentive for a specific action in a specific moment  $t_x$ . Moreover, the field theory or topological psychology provides necessary basic assumptions for modelling dynamic processes: Lewin (1947) derived the basic assumptions of his model of change management dynamics directly from the mathematics of topology. These mathematical models later have been developed to modern decision theory, which relates to single decisions, but they do not relate anymore to the description of greater parts of reality as a psychological field.

## 2 Hypotheses

The main assumption of this contribution is that an organizational structure like the marketplace for educational services can be simulated in a dynamic manner following the classical principles of field theory. This can be done as action research for single projects of organizations based on qualitative data. For simulating the development and assessing the incentives of network solutions the affordance of every object or activity in such a network can be built as a set of variables. Each of them represents the subjective affordance for a specific stakeholder. A subjective affordance generates the incentive for activities of specific stakeholders in a certain moment.

Automatically, the network objects are dynamic, because affordances change depending on stakeholders' knowledge, their actual plans, emotional states, interests and the influence of other stakeholders. To find out in which way the whole network develops the interplay of this factors can be simulated based on empirical information about the stakeholders' psychological preconditions in a specific organizational and technical network solution.

## 3 Method

The design of the simulation model is described below. It allows retrieval of basic information for the simulation of possible effects and to assess the quality of possible solutions for the network design in the market place. These steps are described for this project. Examples of results from applying this method

in the course of the project are shown below (for more details see Wieczorek et al., 2018).

### 3.1 Identification of incentives and obstacles resulting from stakeholder interests

The network of competences started with a preliminary list of the project partners. They have formulated a basic and more or less specific interest for the project. So the starting set of market place agents are: an original equipment manufacturer (OEM), a tier one supplier, a commercial education service provider, a state university, an association of car industry suppliers, and a company developing IT-solutions for on-the-job-training. At the beginning of the project their roles as stakeholders are not fixed. For example, the first level supplier can have the interest to buy certain content and education services, but it also has the possibility to advertise content and services on the network like to let their car workshop to trainees of other companies or education service providers. So semi-structured qualitative interviews have been conducted to collect the following information from each project partner:

- What are success factors for the described market place, which features are necessary?
- Which incentives lead to an active participation in the market place?
- Which features need products to be advertised successfully on the market place?
- Which obstacles exist?
- Which roles must exist in this network?
- Which tasks are related to these roles?
- How do successful owners of a role fulfill their tasks?
- Which are possible own roles and activities in the network?
- Which own resources exist for this role?
- Who are other possible participants for roles defined in the network?
- Which possible outcome has these activities for other network partners?

### 3.2 Integration into a first structural model

The results of the interviews were categorized along the following general structure of networks derived from the theoretical state of the art: First of all *roles* exist in the network. For these roles *tasks* and necessary *resources* to manage the role successfully can be derived from the interview data. Also *stakeholders* (possible owners of roles), *subjective affordances* for single stakeholders and *objective affordances* to for an owner of the role can be extracted. Also other *features* were described in the interviews. Stakeholders are the agents in this system. They are described by their *goals*



and *resources* for one or more possible roles. *Products* and their *features* is the third type of element. All three elements are connected by different types of *relations* (A is dependent on B, A is a realization of B, A is a part of B, A does something to B).

The empirical results are entered in a database and diagramed in a formal system consisting of these elements and relations. Then a structural analysis is conducted based on the following type of matches:

- Participants' resources and the necessary role resources.
- Participants' goals, their specific affordances and role tasks.
- Product features and the participants' resources providing them.
- Participants' goals and product incentives.

This analysis can be done by hand or automatically with standard database queries or a specific deductive data base (Seipel et al., 2016). The method of deriving unified models of such networks out of qualitative unstandardized data from documents and interviews is described in Wieczorek (2020): This methodological approach can be used as a specification for a software which allows to extract valid basic models for simulation for each unique project or network. As a result of this analysis the features are listed which can be used as parameters and variables for the dynamic simulation of the market place.

### 3.3 *Developing dynamic simulation models*

These variables and parameters are integrated in a model simulating market place dynamics. Based on the structural model variables for dynamic simulation can be selected out of the feature list. At first this can be done on a qualitative level in a matrix of influence (Vester, 2012). It describes the interaction in both directions between all direct combinations of two variables in the system. A simple form of description, which can be derived from the qualitative data has four categories:

- Positive (more of A leads to more of B, less of A leads to less of B),
- negative (more of A leads to less of B, less A leads to more of B),
- unknown, but existent,
- non existent.

In a first rough-and-dirty modelling procedure the matrix is filled with these categories. The reasons for choosing one of these four possible relations are described for each combination. If plausible or empirically founded mathematical relations exist,

this first estimation can be replaced by mathematical equations. This allows a dynamic modelling of the market-place structure. This step can be realized with specific editors. In this case the freeware simulation editor insight-maker® (Fortmann-Roe, 2015) has been used which allows an iterative alignment of the market place model. Criteria for assessing the quality and progress of this process are described in Starker & von der Weth (2011) and von der Weth et al. (2016): Logical consistency, non-triviality, plausibility, concreteness.

The iteration stops when logical consistency is reached and non-triviality of possible prognoses is given. The plausibility and concreteness of simulation results must be assessed by experts in several iterations of model development. Concerning non-triviality, the simulation model allows identification of possible developments which have not been known before.

### 3.4 *Identifying critical processes for important network solutions*

The model can be adapted for different questions which arise in the process of the project.

In the course of the project the knowledge about market place structures can change as well as the knowledge about single elements or specific relations. It can be useful to integrate this knowledge into the existing models.

There also exist possible reasons coming from the involvement of action research projects in reality. If there is a vital interest of stakeholders for other solutions it is pragmatic to create them. E.g. it can be useful to analyze system configurations with additional stakeholders or products which do not exist until now or to create sub-models for specific problems or decisions. In most cases these sub-models are simplified.

### 3.5 *Simulation and analysis*

Depending on the quality of the model different analyses can be conducted. Already on the qualitative level of the matrix of influence critical factors, leverage factors and inert factors can be identified. Critical factors influence most other variables simultaneously. There until now exists no convention about the number or percentage of variables in research, so this has to be found in the specific research process. Critical factors (among others) can cause major disturbances in a system and they therefore have to be watched carefully. Critical factors which can be influenced directly by stakeholders' activities are called leverage factors. Measures influencing these factors have strong but difficult to control effects. Inert factors are variables which are influenced by many others. Again there is no convention for „many“, it has to be

defined in the research process. On the qualitative stage possible dynamics in systems can be identified: Two connected positive relations can lead to a self-reinforcing feedback loop. (Motivation for creating high quality products leads to happy customers and vice versa). This suggests any developments which cause a decrease in product quality would have to be monitored carefully as a source of risk which causes a reversal of the positive feedback loop. A positive relation connected to a negative one can lead to a stable equilibrium. The classical economical relation of supply and demand is a system of this type.

The dynamic simulation allows more detailed analysis of these processes by identifying more concretely the course of processes and testing alternative developments depending on the possible different values for chosen variables. Main purpose for this is testing scenarios. These scenarios are fictitious network configurations, values for goals, resources of the stakeholders and hypothetical rules for system dynamics. These scenarios can be figured out during the development process for several reasons: Best case and worst case scenarios, testing the marketplace's reaction on possible critical incidents and crises. Is there consensus about the hypothetical set of variables and functions the result of simulation is exact. So scenarios for the effects of decisions can be developed, the role of critical factors can be described in a more concrete way, and the prerequisites of best and worst case scenarios can be analyzed more carefully.

## 4 Example results of the feasibility study

### 4.1 Development of a structural model

Interviews with stakeholders have been conducted from January to June 2016 ( $n = 12$ ). The range for the duration was from 60 to 120 minutes. The full text interviews were recorded and transcribed. The analysis of the interviews followed fixed rules described in a handbook and started with initial assumptions, derived from theoretical analysis. The elements of the structural model, which has been derived from these data are described in table 1. New elements identified in the interviews are marked in bold.

Table 1: Elements of the structural model. New elements are marked in bold.

<i>Types of elements</i>	<i>Elements</i>
Role	Market place provider Educational products provider <b>Service providers</b> Customer for educational products Learner
Stakeholder	<b>Commercial education provider</b> Software Developer <b>Universities</b> <b>Public Organization / Job Agency</b> Trade Associations / Chambers of Commerce OEM Suppliers <b>Machinery manufacturer</b>
Product	Market place <b>Catalogue of user rules</b> <b>Digital resources</b> <b>Educational products</b> <b>Information about Request</b>

An example for results of the qualitative data analysis based on the structural model is a possible mismatch between the affordances for a market place provider and the aim of the network. A marketplace provider with main focus on economic success must have the interest to generate a maximum of participants. These can generate a conflict with the quality goals of other stakeholders of the network because the number of possible participants is generally limited. There must be other reasons to take part than mere economic success. Possible owners with such features exist and have been interviewed. Table 2 shows that for the stakeholder „association of car suppliers“ matching interests exist and can be taken into account during the design of the affordances of the organizational network solution.

Table 2: Match between role (market place provider) and stakeholder (car suppliers association).

Elements	Features
Role Market Place Provider	<p>Tasks</p> <ul style="list-style-type: none"> <li>Monitoring the rules of the market place and the network</li> <li>Publishing concrete requests</li> </ul> <p>Necessary resources</p> <ul style="list-style-type: none"> <li>Webspace</li> <li>Staff</li> </ul> <p>Other features</p> <ul style="list-style-type: none"> <li>Neutrality (no conflicting interests with other participants)</li> </ul>
Stakeholder Association	<p>Goals</p> <ul style="list-style-type: none"> <li>Similar to the goals of the whole project, e.g. high quality of the educational products for the association members</li> </ul> <p>Existing Resources</p> <ul style="list-style-type: none"> <li>Associates as possible customers</li> <li>Can finance the marketplace from other resources</li> <li>Digital equipment</li> </ul> <p>Other features</p> <ul style="list-style-type: none"> <li>Certification</li> <li>Digital ressources</li> </ul>
Product	<p>Tasks</p> <ul style="list-style-type: none"> <li>Transfer of information</li> </ul> <p>Other features</p> <ul style="list-style-type: none"> <li>Open for all participants</li> </ul>

4.2 Identification of possible developments and risks by simulation studies

An example result for the dynamic simulation related to this problem is a local model of a specific dynamic development of the quality of the offered educational services and tools. It shows processes which can arise when the provider designs a network following some classical principles of very successful market place ebay by publishing prices in the internet and leaving the quality assessment to the users. An assumption of the scenario is, that the number of potential customers is limited because of the specific purpose of the market place. The priority of quality is high, because the car suppliers themselves have to follow strict quality rules. The scenario in figure 1 shows basic assumptions of the simulation model. The dynamic simulation of this process allows analysis of the details of possible risks. There is a self-reinforcing process which can develop, when the market place has too many participants with similar educational products and one of them starts reducing prices.

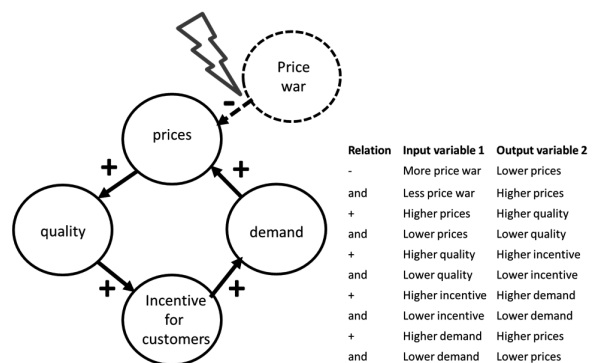


Figure 1: Self-reinforcing feedback-loop. Without price war the system develops in a positive way. A price war leads to a self-reinforcing decrease of the market.

The simulation result in figure 2 shows that even a short price war can lead to an irreversible negative development. This process can be avoided with a high probability, if the owner of the role is the car suppliers association because their main interest

is to provide high and certificated quality for their members. Another part of the solution is that prices are not included in the first description of the offer and detailed pricing takes place after first contact between education product provider and customer.

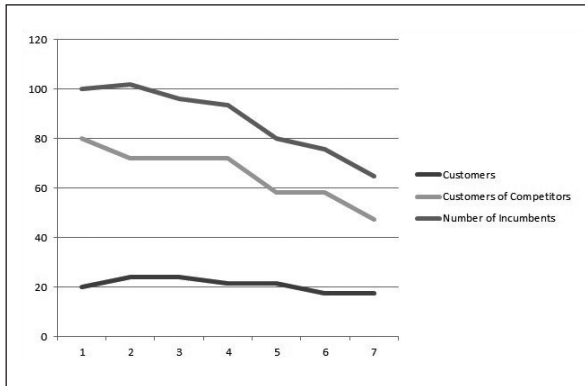


Figure 2: *Dynamic simulation of the price war scenario. Long term effects of a price war at t2 and t3.*

## 5 Discussion

### 5.1 Liquid research

The method described here uses modelling and simulation as a tool to support complex projects. The fit of such models developed step by step during a process of action research in a practical project cannot be tested in one single investigation, like in an experiment. It also influences the course of activities of the project. The structural model and task-specific dynamic simulation models develop in an incremental process during the project. Therefore the authors propose to call this process „liquid research“. Although a useful overall prognosis for the complex project concerning the fulfillment of its goals is not possible in many cases, the quality of models developed this way can be tested: Besides developing a common sense approach for finding testing procedures for the formal criteria of consistency, non-triviality, plausibility, and concreteness, it is also possible to improve the anticipation of consequences of activities step by step during the process. Prognoses about what will happen should improve during the process, if the model improves iteration by iteration.

### 5.2 Limitations

The method is suitable for a better understanding of socio-technical processes in specific projects. It is not capable of proving a general theory of socio-technical change. This can work by integrating such

models from several projects. One can compare these models by conducting meta-analytical studies, but another way is also possible. Because the types of the elements have the same structure, it can be possible to combine them into an overall structural model in a common database with a broader validity for different processes. Besides practical requirements, there exist no rules when the development of a model is finished, and so a permanent process to develop an overall model can be started.

The problem of comparing quality standards for simulation models with classical statistical quality norms like alpha-level of 5 % is not solved until now. A lot of discussion about building quality rules for a „good result“ has to be done. But this not an empirical study, it is a discussion about norms and their justification.

One practical problem at the moment is that modelling is very complicated process. The dynamics of projects can become very high. The retrieval of data for the model, the qualitative modelling and building dynamic models can be overtaken by reality. Then modelling of this type is not adequate for the practical purpose of the projects which are analyzed and supported in this way.

### 5.3 Future activities

State of the art and limitations show the way for the next steps. The tools for simulations of this type can be improved. They must be connected to each other and the models must become more dynamic. A new input should be processed immediately by software to automatically create an expanded model. There must also be a software solution for merging several models of this type. The software solutions should also have easy handling and should be based on standard products which are cheaper to use. Currently, a second project has started following these principles.

The second task is a better foundation of the epistemological background of simulation. Especially, a standard has to be created on how to assess models and simulation results.

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# Diskussion: Belastungen der Mitarbeitenden im Homeoffice

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## ZUSAMMENFASSUNG

Arbeiten im Homeoffice ist seit der Covid-Pandemie für sehr viele Menschen alltäglich geworden. Daher legt diese Diskussion den Schwerpunkt auf Führungspersonen, deren Mitarbeitende im Homeoffice arbeiten. Zudem stehen die Herausforderungen und Belastungen im Homeoffice im Fokus und wie sich diese auf die Gesundheit auswirken. Anhand von deutschsprachigen sowie internationalen Studien werden die Chancen, aber ebenso Risiken aufgezeigt und mithilfe von theoretisch fundierten Modellen kritisch diskutiert.

## Schlüsselwörter

Homeoffice – Führungspersonen – Belastungen – Gesundheit

## ABSTRACT

Working from home has become for many people a daily routine since the Covid pandemic. Therefore, this discussion focuses on leaders whose employees work from home. In addition, the focus is on the challenges and demands in the home office and how this affect health. Based on German-speaking and international studies, the opportunities as well as the risks are highlighted and critically discussed with the help of theoretical models.

## Keywords

Home office – leaders – demands – health

## 1 Einleitung und These

Was bis vor einigen Jahren noch weniger stark verbreitet war, ist seit der Covid-Pandemie für sehr viele Menschen alltäglich geworden: Arbeiten im Homeoffice. Wir verweisen auf die repräsentative Deloitte-Studie, die im Februar 2021 in der Schweiz online durchgeführt wurde. Diese hat unter anderem den Anteil der Beschäftigten im Homeoffice erfasst, der sich während der Pandemie auf 50 % verdoppelt hat (Deloitte Research, 2021). Nach der Pandemie wird der Anteil gewiss wieder sinken. Wir teilen die Einschätzung der Deloitte-Studie, dass der Anteil Beschäftigter im Homeoffice dennoch höher sein wird als vor der Pandemie.

In dieser Diskussion wollen wir den Fokus auf Führungspersonen legen, deren Mitarbeitende im Homeoffice arbeiten. Das Augenmerk legen wir auf die Herausforderungen und Belastungen im Homeoffice und wie sich diese auf die Gesundheit auswirken.

Wie auch schon Konradt & Hertel im Jahr 2002 zeigten, bringt Arbeiten im Homeoffice einige Chancen, aber ebenso Herausforderungen mit sich. Aus unserer Sicht sind Führungspersonen dabei besonders gefordert. Folgende These werden wir in dieser Arbeit untersuchen: Führungspersonen sollten sich mit den hohen Belastungen und deren negativen Auswirkungen auf die Gesundheit der Mitarbeitenden im Homeoffice auseinandersetzen.

## 2 Argumentation

Arbeiten im Homeoffice bringt für Mitarbeitende und Führungspersonen neue Anforderungen mit sich. Schon in der schweizerischen Querschnittstudie „Home Office 2012“ stimmten fast 80 % diesem Umstand zu (Gisin, Schulze, Knöpfli & Degenhardt, 2015). Unserem Eindruck nach hat sich dies nochmals verstärkt und zusätzliche Anforderungen sind in den



letzten Jahren dazugekommen. Allein der technische Fortschritt lässt heute, zehn Jahre später, neue Arbeitsformen zu, wie beispielsweise synchrones Arbeiten an Dokumenten oder Besprechungen mit Videokonferenztools. Wenn wir diesen Umstand anhand des Transaktionalen Belastungsmodells von Cox (1995, zitiert nach Richter, 2000, S. 55) betrachten, zeigt dies gut auf und bestätigt, dass die Anforderungen mit den Ressourcen gemeinsam kognitiv bewertet werden und eine darauffolgende Reaktion auslösen. Wenn Ressourceneitig der Umgang mit neuen Tools und Prozessen nicht oder noch nicht gut beherrscht wird und die Hilfestellung und sozialer Austausch im Homeoffice vermindert sind, wird dies als Belastung bewertet werden und als Stress wahrgenommen, was von Führungspersonen durch die Distanz weniger wahrgenommen wird (Kordsmeyer, Mette, Harth & Mache, 2019).

### **2.1 Unterbrechungen können im Homeoffice besser gesteuert werden**

Die Distanz zu den sozialen Kontakten in der Organisation kann sich aber auch positiv auf die psychische Gesundheit auswirken. Denn besonders spannend fanden wir die Tatsache, dass laut der repräsentativen Stressstudie 2010 in der Schweiz von Grebner, Berlowitz, Alvarado und Cassina (2010), welche auf einer Momentaufnahme beruht, Arbeitsunterbrechungen mit 48 % zu den meist auftretenden Belastungsfaktoren während des Arbeitens gehören. Unseres Erachtens können solche Unterbrechungen im Homeoffice besser gesteuert werden. Gemäß dem Stressreport Deutschland 2012, wo 17'562 Beschäftigte befragt wurden, mindern Unterbrechungen wie ein klingendes Telefon, eine ankommende E-Mail oder eintretende Kollegen\*innen die Leistungsfähigkeit bis zu 40 % und erhöhen die psychischen Belastungen, welche sich u. a. in Schlafstörungen und Nervosität zeigen (Lohmann-Haislah, 2012). Das Yerkes-Dodson-Modell zeigt gut auf, wie Leistung und Aufmerksamkeit zusammenhängen. Wobei die Leistung nur bis zu einem Optimum anwachsen kann und danach keine weitere Steigerung stattfindet, auch wenn die Erregung weiter ansteigt (Yerkes & Dodson, 1908). Wir finden, mit diesem Modell wird gut ersichtlich, wie die Leistungsfähigkeit begrenzt ist und sich damit auf die Belastungen auswirkt. Dabei können Unterbrechungen zwar positiv oder negativ erlebt werden, dies hängt jedoch damit zusammen, wie anspruchsvoll eine Aufgabe ist. Während eine Unterbrechung bei monotonen Aufgaben eine erwünschte Abwechslung ist, erhöht sich der erlebte Stress jedoch bei anspruchsvollen Aufgaben (Lohmann-Haislah, 2012). Unserer Meinung nach werden im Homeoffice eher kognitiv anspruchsvolle-

re Aufgaben bearbeitet. Obwohl Stress eine Herausforderung darstellt, kann mittelmäßiger Stress sogar leistungsfördernd wirken. Bei anhaltendem Stress jedoch wirkt sich das auf das Immunsystem aus und kann sogar Herz-Kreislauf-Erkrankungen hervorrufen (Lohmann-Haislah, 2012). Wir sehen das Homeoffice als Chance, da zu Hause Unterbrechungen besser gesteuert werden können, was jedoch in der Kompetenz der Mitarbeitenden liegt.

### **2.2 Fehlende Belohnung erhöht die psychische Belastung**

Die Resultate der Studie „Does working from home work? Evidence from a Chinese Experiment“ zeigen eine Leistungssteigerung von 13 % bei Mitarbeitenden im Homeoffice. Einer der genannten Gründe dafür war die ruhigere Umgebung zu Hause und andererseits entstand die Leistungssteigerung durch längere und selbstbestimmte Arbeitszeiten, welche u.a. durch Verkürzung der Pausen und durch weniger Kranktage entstanden sind (Bloom, Liang, Roberts & Ying, 2015). Wenn wir das im Hinblick auf die Arbeitsanforderungen vom Job-Demands-Resources-Modell anschauen, konnte die emotionale Belastung durch eine lose zeitliche Bindung reduziert werden und somit Beschwerden wie unter anderem Stress gemindert werden (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). Gegen dieses Argument spricht jedoch der Befund, dass flexible Arbeitszeiten zur Belastung führen können, wenn auch vermehrt nur für Mitarbeitende, die einen hohen Entscheidungs- und Handlungsspielraum haben (Peters, 2013, zitiert nach Dietrich, 2017, S. 65). Unserer Meinung nach kann eine Leistungssteigerung nur durch eine ausgeglichene Balance zwischen Arbeiten und Pausen entstehen. Ist dies jedoch über eine längere Zeit im Ungleichgewicht, wirkt sich dies wiederum negativ auf die Gesundheit aus. Die oben genannte Studie zeigt zudem, wie sehr sich Mitarbeitende im Homeoffice allein fühlen und auch befürchten, weniger oft bei Beförderungen berücksichtigt zu werden (Bloom et al., 2015). Dieser Umstand kann unseres Erachtens ebenso gut mit dem Job-Demands-Resources-Modell unterstrichen werden. Bedingt durch fehlende Arbeitsressourcen wie empfundene fehlende Unterstützung sowie auch keine Aussicht auf Belohnung wirkt sich dies negativ auf die Motivation und weiter auch auf die Gesundheit aus (Demerouti et al., 2001). Diese Aussage kann wiederum mit dem Modell beruflicher Gratifikationskrise bestärkt werden, denn wenn die Mitarbeitenden das Gefühl haben, ihr Einsatz wird nicht mit einer entsprechenden Belohnung kompensiert, erhöht sich die psychische Belastung, die ein Herzinfarkt-Risiko zunehmen lässt (Siegrist, 1996).



### 2.3 Früher haben Führungspersonen Anweisungen erteilt, heute im Homeoffice ist ein gutes Selbstmanagement gefordert

Was wir auch als ein großes Gesundheitsrisiko in diesem Zusammenhang einschätzen, ist, dass weniger Feedback von Führungspersonen durch die Homeoffice-Situation keine realistische Selbsteinschätzung der Arbeit der Mitarbeitenden mehr ermöglicht und somit die Gefahr der Selbstausbeutung ansteigt (Konradt & Hertel, 2002). Wesentlich aus unserer Sicht sind fehlende soziale Hinweisreize oder Kontexte für die Entstehung von Unsicherheit bei der Bewertung (Konradt & Hertel, 2002). Das Arbeiten im Homeoffice erfordert hohe Selbstmanagement- und Arbeitsgestaltungskompetenzen (Mojtahedzadeh, Rohwer, Lengen, Harth & Mache, 2021). Viele Arbeitnehmende haben Mühe damit, denn früher wurden sie durch Anweisungen von Führungspersonen unterstützt, wohingegen heute im Homeoffice ein gutes Selbstmanagement gefordert ist (Fichter, 2019). Eng damit verbunden ist der Handlungsspielraum, der sich auf die psychische Gesundheit auswirken kann. Das Anforderungs-Kontroll-Modell von Karasek (1979, zitiert durch Dietrich, 2017, S. 70) hat zwei Dimensionen, den Handlungsspielraum und die Anforderungen und unterscheidet vier Ausprägungen von Arbeitsbedingungen und ihre Auswirkungen auf die psychische Gesundheit. In Bezug zu obiger Aussage von Fichter sehen wir dies auch im Modell deutlich bestätigt: Bei geringem Handlungsspielraum, in Kombination mit hohen Anforderungen und zugleich niedriger sozialer Unterstützung werden Mitarbeitende stark beansprucht (Dietrich, 2017).

Die Grenzen zwischen Arbeits- und Privatleben werden im Homeoffice nahezu aufgelöst, wodurch die Gefahr der Entgrenzung erhöht wird. Dies kann in vermehrten Überstunden und Unterschreitung der Mindestruhezeiten resultieren (Mojtahedzadeh et al., 2021). Da dies von Führungspersonen aus der Ferne wenig überwacht werden kann, sehen wir dies als ein großes Risiko für die Entstehung von psychischen Erkrankungen an. Die Hilflosigkeit oder der Kontrollverlust kann bis zu einem Burnout oder einer Depression führen (Lohmann-Haislah, 2012).

Bei virtuellen Teams ist der Organisationsaufwand erhöht, die Identifikation und Integration der Mitarbeitenden mit dem Team und der Organisation ist verringert und das Konfliktpotential steigt durch unvollständige Information (Konradt & Hertel, 2002). Führungspersonen können zum Beispiel durch vermehrte Konflikte teilweise Rückschlüsse auf die Belastungssituation ihrer Mitarbeitenden ziehen. Dies erachten wir als wichtiges Anzeichen, um Belastungen wahrzunehmen.

### 3 Fazit

Wie wir aufgezeigt haben, gibt es beim Arbeiten im Homeoffice einige Vorteile für die Gesundheit und Work-Life-Balance, aber auch viele Belastungen, die von Führungspersonen noch nicht bewusst wahrgenommen werden. Kurzfristig wirken sich Belastungen wenig auf die Gesundheit aus. Wenn aber das Homeoffice zur regelmäßigen Tätigkeit wird, ist es aus unserer Sicht zwingend notwendig, Führungspersonen aber auch Mitarbeitende auf Belastungen hin zu sensibilisieren, da sich diese negativ auf die psychische sowie physische Gesundheit auswirken. Auch wenn wir unsere Diskussion bestätigt sehen, betrachten wir es als bedeutungsvoll, dass vermehrt Maßnahmen ergriffen werden, damit gesundheitsfördernde Arbeitsbedingungen im Homeoffice sowie eine Kompetenzerweiterung bei Führungspersonen und Mitarbeitenden geschaffen werden. So sind z. B. Vereinbarungen zu definieren zu Erreichbarkeit und Arbeitszeiten sowie Unterstützung für die Selbstorganisation durch Führungspersonen zu geben (Mojtahedzadeh et al., 2021). Ebenso erachten wir die Förderung im sozialen Bereich wichtig, wie z. B. die Einführung von virtuellen Kaffeepausen, aktiver Austausch und regelmäßige Information, damit die psychische Gesundheit gestärkt werden kann (Siegrist, 2021). Wir regen Führungspersonen an, sich mit den Belastungen der Mitarbeitenden im Homeoffice vermehrt auseinanderzusetzen.

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# Exploration und Exploitation als Ordnungskategorien menschlichen Verhaltens und Entscheidens – Parallelen und Implikationen für die Unternehmensführung

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## ZUSAMMENFASSUNG

Die widerläufigen Mechanismen Exploitation, dem Nutzen bestehender Ressourcen und Prozesse, und Exploration, dem Suchen neuer Ressourcen und Prozesse, stehen sich als Gegensatzpaar auf vielen Ebenen tierischen und menschlichen Verhaltens gegenüber. Zugleich eröffnet diese dichotome Perspektive das Potential eine Vielzahl adaptiver Prozesse zu beschreiben; so etwa unsere visuelle Wahrnehmung, die Veränderung unseres Denkens über die Lebensspanne, die Abstimmung von Verhalten in sozialen Gruppen, bis hin zur strategischen Organisation ganzer Unternehmen. Tatsächlich navigieren Unternehmen in dynamischen Märkten sehr ähnlich den verhaltensleitenden Mechanismen von Exploitation und Exploration bei Tier und Mensch. In dieser Arbeit versuchen wir selektiv Befunde aus der Forschung zu Exploitation und Exploration bei Tier und Mensch zu überblicken, diese mit Befunden aus der Unternehmensführung zu verknüpfen und Implikationen für die strategische Organisation von Unternehmen abzuleiten.

## Schüsselwörter

Exploration – Exploitation – Kognition – Persönlichkeit – Führung – strategische Führung

## ABSTRACT

The contradictory mechanisms of exploitation, the use of existing resources and processes, and exploration, the search for new resources and processes, oppose each other on many levels of animal and human behavior. At the same time, this dichotomous perspective opens up the potential to describe a variety of adaptive processes; such as our visual perception, the change in our thinking across the lifespan, the tuning of behavior in social groups, up to the strategic organization of entire companies. Indeed, firms navigate dynamic markets very similarly to the behavioral mechanisms of exploitation and exploration in animals and humans. In this paper, we attempt to selectively review findings from research on exploitation and exploration in animals and humans, link them to findings from business management, and derive implications for the strategic organization of firms.

## Keywords

Exploration – exploitation – cognition – personality – leadership – strategic leadership

Stellen Sie sich die folgenden Szenarien vor. *Erstens:* Sie arbeiten für ein Uhrenunternehmen und werden danach bezahlt, wie viele funktionsfähige Uhren Sie herstellen können. Sie haben Zugang zu zwei Fertigungsmaschinen, können aber immer nur eine benutzen. Am ersten Tag wissen Sie nichts über die Maschinen, also wählen Sie eine zufällig aus und beginnen mit der Arbeit. Nach zehn funktionierenden Uhren produziert die Maschine eine Fehlerhafte. Was tun Sie

nun? Nehmen Sie die fehlerhafte Uhr hin und arbeiten weiter, oder versuchen Sie ihr Glück an der anderen Maschine? Sie könnte weniger fehlerhafte Uhren produzieren und ihre Bezahlung so erhöhen, oder sie könnte ebenfalls Probleme machen. Vielleicht sogar mehr als die Maschine, die sie aktuell benutzen. *Zweitens:* Sie sind ein Student auf dem Dating-Markt. Ihr Ziel könnte es sein, den Partner fürs Leben zu finden, oder Sie sind eher daran interessiert, mit so vielen

Menschen wie möglich auszugehen. Wie würden Sie diese Ziele angehen? Könnten Sie sie zu einer perfekten Suchstrategie kombinieren? Was ist, wenn der Partner Ihrer Wahl nicht an Ihnen interessiert ist? *Drittens*: Sie kommen für ein paar Tage in eine Stadt und haben eine Reihe von Restaurants zur Auswahl. Probieren Sie so viele verschiedene Restaurants wie möglich aus, oder suchen Sie nach Restaurants eines bestimmten Typs? Hören Sie gegen Ende Ihres Besuchs in der Stadt auf, nach neuen Restaurants zu suchen, und besuchen Sie die Restaurants, die Ihnen am besten gefallen haben? Wann stellen Sie Ihre Strategie um? *Viertens*: Sie sind eine Biene, die in einem Blumenfeld nach Nektar sucht. Sie suchen sich ein Blumenfeld aus und beginnen, den Nektar zu ernten. Wie lange sollten Sie an diesem Fleck bleiben, bevor Sie einen anderen suchen? Wechseln Sie den Ort, wenn ein Großteil der Blumen abgeerntet ist und es schwerer wird Nektar zu finden, oder bleiben Sie bis die letzte Blüte geerntet ist? Was ist, wenn der Nektar in den nahe gelegenen Blumenfeldern bereits geerntet wurde? *Fünftens*: Stellen Sie sich vor, Sie sind an der Stelle von Mark Zuckerberg, dem Geschäftsführer von Facebook. Sie betreiben eine erfolgreiche Social Media Plattform mit vielen Millionen Nutzern. Immer wieder treten jedoch Probleme im Zusammenhang mit Datenschutzgesetzen auf. Versuchen Sie nun diese Probleme zu lösen, um weiter auf das etablierte Modell ihres Unternehmens zu bauen, oder setzen Sie, wie Mark Zuckerberg, auf völlig neue Perspektiven, wie das Metaverse und virtual reality Technologie?

All diese Szenarien vereint ein Element, jede mögliche Entscheidung ist entweder explorativ oder exploitativ (z. B. im Bereich des Verstärkungslernens und der Neurowissenschaften: Cohen, McClure & Yu, 2007; bei der Futtersuche: Cook, Franks & Robinson, 2013; bei binären riskanten Entscheidungen: Gonzalez & Dutt, 2011; im organisationalen Lernen: Gupta, Smith & Shalley, 2006; für eine Übersicht, siehe Hills et al., 2015). In anderen Worten, Exploitation ist das Verbleiben bei einer Option, sei es eine Maschine, ein Blumenbeet, ein Restaurant, ein Partner oder eine Dienstleistung – sprich die optimale Nutzung bestehender Ressourcen und Prozesse. Dagegen ist Exploration auf einen Wechsel hin zu neuen Optionen mit möglichem Belohnungswert ausgerichtet, seien es fehlerfreie Uhren, mehr Nektar, besseres Essen, einen höheren Reproduktionswert oder eine gewinnbringende Dienstleistung. Obwohl diese Konzepte auf den ersten Blick einfach erscheinen (z. B. Bleiben ist Exploitation, Wechseln ist Exploration), ist eine situationsangemessene Entscheidung für Erkundungsverhalten oder Ausbeuterverhalten, oder auch eine Balance zwischen beiden Orientierungen, keineswegs einfach. Tatsächlich gelten Kompromisse zwischen Exploration und Exploitation als eine der grund-

legenden Herausforderungen adaptiver Steuerung von Verhalten (Cohen et al., 2007; Mehlhorn et al., 2015). Das ist nicht nur zutreffend für das Verhalten von Tier und Mensch, sondern auch für soziale Gruppen, wie Organisationen. Dennoch gibt es wenige Arbeiten, die versuchen die Grenzen der jeweiligen Forschungsdisziplinen zu überbrücken und eine Zusammenschau der Befunde zu wagen. Unsere Arbeit setzt genau dort an: wir versuchen die wichtigsten Befunde zu Exploitation und Exploration im Verhalten von Individuen zu überblicken, um diese dann an grundlegende Prinzipien der Führung *in* und Führung *von* Unternehmen anzuknüpfen, mit Implikationen für die strategische Organisation von Unternehmen.

## 1 Vom Individuum zur strategischen Organisation: Eine Einführung

Situationen in welchen der Kompromiss von Exploration und Exploitation abgeschätzt und angewandt werden muss finden sich in vielen Funktionsbereichen bei Menschen genauso wie bei Tieren. *Erstens*: Die Futtersuche bei Tieren (Stephens et al., 2008), Aufsuchen einer bereits bekannten Futterstelle oder Suche nach neuen Futterstellen, die möglicherweise ertragreicher oder bei anderen Tieren weniger bekannt sind. *Zweitens*: Die visuelle Suche, Analyse einer spezifischen Stelle auf einem Röntgenbild der Brust bei einer Vermutung auf Brustkrebs gegenüber der Suche nach der nächsten zu untersuchenden Stelle (Wolfe et al. 2005). *Drittens*: Die Informationssuche, Suche nach Informationen innerhalb eines Schriftstücks gegenüber der Suche nach neuen Dokumenten, welche weitere Informationen bieten können (Pirulli, 2005). *Viertens*: Die Suche im eigenen Gedächtnis, Versuch sich möglichst genau an eine spezifische Situation zu erinnern, oder Suche auf weitere ähnliche Situationen ausweiten (Hills et al., 2015). *Fünftens*: Die Suche bei der Problemlösung, Konzentrieren auf Lösungen, die in der Vergangenheit funktioniert haben, anstelle der Suche nach neuen Lösungen (Wilke et al., 2009). *Sechstens*: Soziales Lernen, Erlangen von neuem Wissen durch Lernen oder Kopieren von vorhandenem Wissen oder Suche nach neuem Wissen durch Innovationsaktivitäten (Hills et al., 2015). *Siebtens*: Die übergeordneten Persönlichkeitsmerkmale Stabilität und Plastizität, welche den Big Five zugrunde liegen, beschreiben die Tendenz zur Aufrechterhaltung bestehender Ressourcen in einem sich verändernden Umfeld und die Suche nach Neuem sowie die Fähigkeit sich anzupassen (DeYoung et al., 2002; Digman, 1997).

Ein zentraler Aspekt eines breiten Spektrums von Entscheidungsproblemen ist die Abwägung, wann man eine bekannte Option mit einem bekannten Belohnungswert nutzt und wann man eine alternative

Option mit einer ungewissen, aber potenziell höheren Auszahlung ausprobiert. Genau dieses Entscheidungsdilemma steht im Mittelpunkt des „Exploration / Exploitation trade-off“ (Cohen et al., 2007; Addicott et al., 2017). Ein ausgewogenes Verhältnis zwischen Exploration und Exploitation ist entscheidend für die Maximierung der Belohnungen und die Minimierung der Kosten auf lange Sicht (Addicott et al., 2017). Zu viel Exploitation hindert eine Person daran, in einer unbeständigen Umgebung neue Informationen zu sammeln, und begünstigt Inflexibilität und Gewohnheitsbildung. Zu viel Exploration hingegen kann zu ineffizienten und inkonsistenten Entscheidungen führen und damit die langfristigen Gewinne verringern (Beeler et al., 2014; Addicott et al., 2017).

Zusammengefasst, in all diesen Domänen sind Exploration und Exploitation übergeordnete Strategien, welche das beobachtbare Denken, Entscheiden und Verhalten treffend beschreiben. Während die Umwelt häufig Informationen liefert, welche der beiden Strategien adaptiv ist, zeigen Individuen darüber hinaus auch stabile Neigungen sich eher exploitativ oder explorativ zu verhalten. Menschen sind die kleinste Einheit in Organisationen und sie führen Organisationen. Tatsächlich spiegeln sich die beiden Strategien hin zu mehr Exploration und Exploitation auch im Führen *in* und Führen *von* Unternehmen wider.

Bei der Führung *in* Unternehmen findet sich dieser Kontrast in der Form des Führungsverhaltens, so kann unterschiedliches Führungsverhalten durch Führungskräfte das Verhalten der Mitarbeitenden entweder erweitern oder verengen. Bei einer Erweiterung des Verhaltens werden innovative Ideen gefördert, wohingegen eine Verengung des Mitarbeitendenverhaltens Innovation schmälert, aber zu höherer Individualleistung führt. Eine Erweiterung des Verhaltens kann beispielsweise durch empowernde und partizipative Führung erreicht werden, wohingegen eine Einengung des Verhaltens der Unterstellten durch engmaschige Kontrolle und rigide Strukturen erreicht wird (Maran et al., 2021; Fürstenberg et al., 2021; Kearney et al., 2019). Gleichermaßen findet die Dichotomie und Balance von Exploration und Exploitation auch bei der Führung *von* Unternehmen, also der Ebene strategischer Planung, Anwendung. Unternehmen fokussieren sich entweder darauf die aktuellen Produkte oder Dienstleistungen zu verbessern, laufende Prozesse effizienter zu gestalten oder Kosten zu senken (Exploitation), oder ihr Fokus liegt darauf neue Produkte oder Dienstleistungen zu entwickeln, und neue Kundensegmente zu gewinnen (Exploration) (Jansen et al., 2006).

Die Strategie ist das übergeordnete Muster hinter den Entscheidungen eines Unternehmens, sie ist das oberste Ordnungsprinzip und daher entscheidungsbestimmend (Porter, 1991, 1996). Diese Feststellung hat

wichtige Implikationen, so etwa, dass Struktur, Prozesse, Belohnungssysteme, aber auch das Verhalten von Führungskräften, schlicht die ganze Organisationskultur, abgestimmt und angepasst werden muss an die übergeordnete Strategie. Daher gilt, wenn es um die Führung von Unternehmen geht, die Redensart aus der Architektur: „Form follows function“, vorrangig für die gewählte Form ist die Funktion, welche ein Gebäude erfüllen soll. Dieses Prinzip findet auch in der Führung *in* Unternehmen und *von* Unternehmen Anwendung. In anderen Worten, Unternehmen werden strategisch organisiert. So etwa folgt die strategische Organisation von Unternehmen die eine exploitative Strategie umsetzen einem hierarchischen Aufbau mit engmaschiger Kontrolle, starker Spezialisierung der Mitarbeitenden auf einzelne Fachgebiete, starker Formalisierung und hoher Zentralisierung von Entscheidungen. Wohingegen solche Unternehmen die eine explorative Strategie verfolgen, organisch organisiert sind, wenig feste Strukturen und Formalisierung einsetzen, geringe Spezialisierung der Mitarbeitenden aufweisen und dezentralisiert sind (Robbins & Judge, 2018). Führung *in* Organisationen ist daher auch ein Ergebnis der übergeordneten Strategie des Unternehmens, spricht der Führung *von* Unternehmen. An der Schnittstelle stehen die Führungskräfte die in ihren Unternehmen und das Unternehmen als Ganzes führen. Ähnlich der Strategie selbst ist ihr Tun in exploitativem und explorativem Entscheiden und Verhalten organisiert. Kurz gesagt, die Praxis der Führung *in* und *von* Unternehmen zeigt Organisationsprinzipien auf, die wir in der Verhaltensforschung bei Individuen und sozialen Gruppen zumindest als Parallelen, wenn nicht als übergeordnete Mechanismen, wiederfinden (Hills et al., 2015; Mehlhorn et al., 2015).

## 2 Individuelle Exploration und Exploitation: Gehirn, Kognition, Persönlichkeit

Eine Reihe individueller Faktoren kann sich auf die Abwägung zwischen Exploration und Exploitation einer Person auswirken und so ihr Verhalten beeinflussen. Zu den Domänen welche im Entscheidungsprozess zwischen Exploration und Exploitation eine zentrale Rolle spielen gehören die Neurowissenschaften, die Kognitionspsychologie sowie die Persönlichkeit einer Person. Einer der für die Steuerung von Exploration und Exploitation besonders wichtigen Neurotransmitter ist Dopamin. Dessen Ausschüttung beeinflusst maßgeblich das Explorations- bzw. Exploitationsverhalten (Robbins & Roberts, 2007; Cools & D'Esposito, 2011). Kognitive Faktoren wie Arbeitsgedächtniskapazität (Hills & Pachur, 2012; Rakow et al., 2008), Zahlenverständnis, ein hohes Anspruchsniveau (Simon, 1990; Newell & Lee, 2011) und die selbst ein-



geschätzte Fähigkeit des rationalen Denkens (Lejarraga, 2010) erhöhen das Explorationsverhalten. Auch die Persönlichkeit einer Person wirkt sich auf den Exploration / Exploitation trade-off aus. Personen mit stabilen Persönlichkeitsmerkmalen neigen eher zu Exploitation während Personen mit hoher Plastizität eher zur Exploration neigen (DeYoung et al., 2002).

### **2.1 Neurowissenschaft: Exploration und Exploitation im menschlichen Gehirn**

Denken Sie zurück an die Entscheidungen in den ersten Sätzen dieser Arbeit. Entscheidungen zwischen Exploration und Exploitation. Wenn wir vor solchen Entscheidungen stehen, laufen im Gehirn eine Reihe von Aktivitäten ab, die von einer Vielzahl von neuronalen Schaltkreisen bestimmt und gesteuert werden. Diese Entscheidungen basieren auf der Grundlage von Zielen und Motivationen unter der gleichzeitigen Inbetrachtung der Ungewissheit in Bezug auf deren Erreichung. Das Hirnareal, welches die Forschung am häufigsten mit der Bewertung des Kompromisses zwischen Exploration und Exploitation sowie der Aufrechterhaltung und Anpassung von Zielen in Verbindung bringt, ist der dorsale und der mediale präfrontale Kortex (Fuster, 2015). Bei der Steuerung dieser Vorgänge spielen eine Vielzahl an Neurotransmittern eine Rolle, einer der wichtigsten hiervon ist Dopamin (Robins & Roberts, 2007; Cools & D'Esposito, 2011). Dopamin verstärkt die Aufmerksamkeitskontrolle als Reaktion auf unerwartete Reize (Schultz, 1998), und beeinflusst das Belohnungsstreben bei verschiedenen Spezies (Hills, 2006; Barron et al., 2010). Die Aufrechterhaltung und Aktualisierung von Zielen wird durch phasische und tonische Aktivierungsmuster beeinflusst (Redish et al., 2007; Beeler et al., 2010). Es wird angenommen, dass die Stimulierung von Dopaminrezeptoren, durch die Ausschüttung von Dopamin das Signal-Rausch-Verhältnis der neuronalen Feuerung erhöht (Servan-Schreiber et al., 1990). Dies erhöht die Zielrepräsentationen gegenüber Ablenkungen (Durstewitz & Seamans, 2008), wodurch die Stabilität von Zielen und den Handlungen, welche zur Erreichung und Exploitation dieser dienen, aufrechterhalten wird (Hills et al., 2015).

### **2.2 Kognition: Exploration und Exploitation im Denken**

Kognition beschreibt die Funktionen der Informationsverarbeitung und des Denkens. Ob eine Ressource genutzt werden soll (Exploitation), oder ob nach neuen Ressourcen gesucht werden soll (Exploration) bedarf stetiger Abwägung unter Einbeziehung sämtlicher wichtiger Faktoren, wie der aktuellen Situation, der Ressourcenlage und der eigenen Fähigkeiten.

Eine Vielzahl kognitiver Faktoren eines Individuums beeinflussen diese Abwägung.

Ein einzelner Organismus muss das richtige Gleichgewicht zwischen Exploration und Exploitation finden um zu überleben. Er muss ausreichend neue Möglichkeiten erkunden, um genügend Ressourcen zu finden, und muss gleichzeitig die gefundenen Ressourcen nutzen und ernten. Das Problem der optimalen Streuung lässt sich im Tierreich bei der Nahrungssuche beobachten. Dort sammeln sich zahlreiche Tiere und Arten an einem Fleck bis die Erwerbsrate der einzelnen Tiere unter einen Schwellenwert fällt (Charnov, 1976). Wenn dieser Schwellenwert unterschritten wird, kommt es zur Suche nach einer neuen Futterstelle (Stephens et al., 2008; Stephens & Krebs, 2019; Hills et al., 2015).

Die visuelle Suche beim Menschen stellt eine weitere kognitive Kompromissituation zwischen Exploration und Exploitation dar. Bei einer klassischen Suchaufgabe, bei der die Probanden eine Reihe verschiedener Szenen nach Zielobjekten absuchen müssen, welche unter anderen irrelevanten Objekten versteckt sind, muss entschieden werden, wie viel Zeit auf die Suche nach den Zielobjekten in einer Szene aufgewendet wird, bis zur nächsten Szene gewechselt wird (Chun & Wolfe, 1996). Feiner betrachtet muss gleichzeitig abgewogen werden, wie viel Zeit für die Betrachtung jedes einzelnen Objekts innerhalb einer Szene aufgebracht wird, bevor zum nächsten Objekt in der Szene gewechselt wird. Ein Radiologe muss beispielsweise täglich eine Vielzahl an Röntgenbildern analysieren, hierbei muss er immer die Suchzeit für jedes einzelne Röntgenbild gegen die Notwendigkeit abwägen, das nächste Bild zu analysieren. Diese Entscheidung wird beeinflusst von den visuellen Eigenschaften des Stimulus (Treisman & Gelade, 1980), der Wahrscheinlichkeit, ein Ziel, in diesem Fall also eine Auffälligkeit im Röntgenbild, zu finden (Wolfe et al. 2005), der Belohnungsstruktur (Kristjánsson et al., 2010), der Anzahl der zu scannenden Objekte im Stimulus (Cousineau & Shiffrin, 2004) und der Fehlerhistorie (Chun & Wolfe, 1996). All dies sind Faktoren, die auch für die Suche in anderen Bereichen gelten (Hills et al., 2015).

Die Modulation zwischen Exploration und Exploitation ist aber auch für eine Vielzahl an nicht-visuellen Aspekten des menschlichen, alltäglichen Verhaltens ausschlaggebend. Die Suche nach potenziellen Partnern stellt beispielsweise eine soziale Situation dar in welche der Exploration / Exploitation trade-off auftritt. Hierbei kann beispielsweise der Suchraum aufgrund eines sich veränderten Partnerqualitätsschwellenwerts von einem lokalen Suchraum auf einen regionalen erweitert werden (Hills & Todd, 2008). Andere alltägliche Situationen sind die Informationssuche, Menschen, die in ihrer Umgebung nach Informa-



tionen suchen, (z. B. im Internet oder in sozialen Netzwerken) erweitern oder verringern ihren Suchraum ebenfalls adaptiv und wechseln so beispielsweise von lokaler zu globaler Suche. Sie verlassen den lokalen Bereich einer spezifischen Webseite wenn sie feststellen, dass deren Wert unter das fällt, was an anderer Stelle global gefunden werden kann (Pirolli, 2005). Bei der Entscheidungsfindung beginnt die Suche nach Entscheidungshilfe und nützlichen Informationen oft bei denjenigen, die in der Vergangenheit bei Entscheidungen behilflich sein konnten (lokaler Fokus), und geht dann zu anderen über, bis genügend Anhaltspunkte gefunden wurden, um eine Entscheidung zu treffen (Gigerenzer et al., 2012). Dieses Muster kommt auch beim Problemlösen zum Tragen. Hierbei werden frühere Erfahrungen genutzt, um zu entscheiden wie viel Zeit auf einem lokalen „Fleck“ verbracht werden soll, bevor zum nächsten übergegangen wird. Bei einer Anagrammaufgabe, bei der es darum geht, aus einer Reihe zufälliger Buchstaben Wörter zu bilden, nutzen Menschen beispielsweise die Entdeckung früherer Lösungen, um zu bestimmen, wie lange sie sich in einem lokalen „Fleck“ aufhalten (Wilke et al., 2009), ähnlich gehen Probanden auch beim Angeln nach Fischen in einer Reihe virtueller Teiche auf einem Computerbildschirm vor (Hutchinson et al., 2008). Die Tendenz Ressourcen in der Nähe zum Fundort anderer Ressourcen zu erwarten kann größtenteils als ein kognitiver Bias beschrieben werden, der manchmal auch als „hot-hand fallacy“ bezeichnet wird (Scheibehenne et al., 2011).

Die menschliche Kognition spielt eine entscheidende Rolle bei der Entscheidungsfindung und Abstimmung von explorativem und exploitativem Verhalten. In sämtlichen Situationen wird sie eingesetzt um ein möglichst optimales Gleichgewicht zwischen Exploration und Exploitation zu bestimmen, welches zu den besten Resultaten für die betroffene Person führen soll.

### **2.3 *Persönlichkeit: Sind Exploration und Exploitation stabile Merkmale?***

Die Persönlichkeit eines Menschen ist eine Anordnung individueller Dispositionen, die über die gesamte Lebensspanne relativ stabil ist. Die Persönlichkeit prägt Erfahrungen bei der Wahrnehmung, Bewertung und Interaktion mit externen Objekten und Ereignissen, sowie die internen Kognitionen, Gefühle und Verhaltensweisen eines Menschen und beeinflusst damit auch das Verhalten dieser Person (Goldberg, 1995).

Zur Beschreibung der Persönlichkeit findet ein induktiv entwickeltes Modell breiten Konsens und konnte in verschiedenen Kulturen repliziert werden: das Big-Five-Modell der Persönlichkeit (McCrae & Costa, 1987). Das Modell besteht aus fünf Dimen-

sionen (OCEAN), nämlich Offenheit für Erfahrungen, Gewissenhaftigkeit, Extraversion, Verträglichkeit und Neurotizismus. Neuere Ansätze zur Persönlichkeitsanalyse verwenden jedoch zwei übergeordnete Persönlichkeitsmerkmale höherer Ordnung (Liu & Campbell, 2017), die den Big Five zugrunde liegen, und betonen damit die unterschiedliche Auflösungstiefe bei der Messung interindividueller Unterschiede (Digman, 1997). Bei diesen übergeordneten Persönlichkeitsmerkmalen handelt es sich um Stabilität, mit dem Ziel der Aufrechterhaltung bestehender Ressourcen in einem sich verändernden Umfeld - und Plastizität, welche im Zusammenhang mit der Suche nach Neuem und der Anpassungsfähigkeit steht (DeYoung et al., 2002). Interessanterweise deuten Studien darauf hin, dass sich einige Verhaltensweisen beim Menschen besser durch Stabilität und Plastizität erklären lassen als durch das Big-Five-Faktorenmodell (Hirsh et al., 2009). Nach Digman (1997) bezieht sich das erste übergeordnete Persönlichkeitsmerkmal Stabilität auf das Verhalten von Personen, die dazu neigen, Veränderungen und Störungen zu vermeiden. Stabilität umfasst Gewissenhaftigkeit, Verträglichkeit und emotionale Stabilität (geringer Neurotizismus). Gewissenhaftigkeit beschreibt Personen mit einem hohen Maß an Disziplin, Fleiß und starker Arbeitsmoral. Verträglichkeit steht im Zusammenhang mit Höflichkeit, Freundlichkeit und positiven sozialen Interaktionen. Die letzte Dimension wird als Neurotizismus bezeichnet und beinhaltet die Unfähigkeit einer Person, negative psychologische Zustände zu bewältigen. Stark neurotischen Personen mangelt es oft an Selbstvertrauen, und sie sind oft pessimistisch. Andererseits neigen Personen mit einem niedrigen Grad an Neurotizismus dazu, emotional stabil, entspannt und selbstbewusst zu sein (Pletzer et al., 2019; Costa & McCrae, 1992 b; Pickering et al., 2016). Das zweite übergeordnete Persönlichkeitsmerkmal Plastizität kann als eine gemeinsame Varianz von Offenheit und Extraversion beschrieben werden und bezieht sich auf ein Persönlichkeitssystem, das dazu neigt, eher explorativ zu sein (z. B. neue Ideen oder Strategien zu entwickeln). Extraversion bezieht sich auf einen aufgeschlossenen und sozialen Charakter, Optimismus, Erregungsstreben sowie soziale Aufmerksamkeit (Costa & McCrae, 1992 b; Eaves & Eysenck, 1975; Ashton, Lee & Paunonen, 2002; Maran et al., 2019; Maran et al., 2020). Offenheit wird mit der Suche nach neuen Erfahrungen, einem hohen Maß an Neugier und einer größeren Bereitschaft zum Erlernen neuer Fähigkeiten in Verbindung gebracht (Costa & McCrae, 1992 b). Offene Personen sind motiviert Probleme zu lösen und arbeiten gerne an herausfordernden Tätigkeiten (Christensen et al., 2020; Heinström, 2005; Datta et al., 2005; Maran et al., 2022). Hochgradig offene Personen meistern häufig ungewohnte Situationen, Lösen Probleme durch das

Ausprobieren neuer Ansätze und mögen vorgegebene Strukturen nicht (McCrae & Sutin, 2009).

Der Exploration / Exploitation trade-off wird allerdings auch von zeitabhängigen Prozessen beeinflusst, welche aber zugleich bei allen Menschen einheitlich verlaufen. Zu diesen gehören beispielsweise das Alter, bereits durchlaufene Erfahrungen und der aktuelle Zustand des Individuums. Mit steigendem Lebensalter sinkt das Explorationsverhalten in Menschen (Mata, Wilke & Czienskowski, 2013), Veränderungen in der Kognition, im Affekt und in der Hirnfunktion führen zu einer Verschiebung der Art des Denkens im höheren Erwachsenenalter. Hierbei wird die Nutzung von Vorwissen, und damit Exploitation, gegenüber der explorativen Suche als Ausgangspunkt für das Denken und Handeln bevorzugt. Die altersbedingte Exploitationsneigung resultiert aus der Anhäufung von Vorwissen, einer verringerten kognitiven Kontrolle und einer Verlagerung auf affektive Ziele. Dies geht einher mit Veränderungen in kortikalen Netzwerken sowie in Aufmerksamkeits- und Belohnungsschaltkreisen. Durch die Einbeziehung dieser Faktoren in eine einheitliche Darstellung bietet die Verlagerung von der Exploration zur Exploitation ein integratives Modell der kognitiven, affektiven und Gehirnalterung (Spreng & Turner, 2021). Der Zustand in welchem sich ein Individuum im Moment der Abwägung zwischen Exploration und Exploitation befindet spielt ebenfalls eine wichtige Rolle, so sorgt ein erhöhtes Energieniveau zu einer Verringerung der Zeit, welche Tiere für die Nahrungssuche aufwenden und erhöht die Zeit, welche sie mit der Wachsamkeit gegenüber Raubtieren verbringen (Bachman, 1993; Kotler, Brown & Bouskila, 2004). Negative oder geringe Energiebudgets führen zu einer Präferenz für variable oder unbekannte Ergebnisse (d. h. Exploration) und positive Energiebudgets führen zu Präferenzen für stabile und bekannte Ergebnisse (d. h. Exploitation; Caraco et al., 1990; Bacon et al., 2010; Caraco, 1981).

#### **2.4 Exploration und Exploitation bei strategischen Führungskräften: Implikationen für strategische Organisation**

Während zurückliegende Ansätze in der Strategieforschung die Bedeutung der Umweltfaktoren hervorheben, betonen neuere Ansätze, dass Unternehmensstrategien mehr auf die inneren Ressourcen des Unternehmens selbst bauen müssen. Deshalb ist die Strategie kein zwingendes Resultat der Umwelt, wie etwa Branche und Konkurrenz, vielmehr liegt es an den strategischen Führungskräften übergeordnete Ziele zu definieren und deren Erreichung durch eine informierte Strategie zu planen. Wie Unternehmen strategisch organisiert sind, ist also immer auch ein Spiegel der Persönlichkeit der Führungskräfte, die

strategisch planen und nach innen führen. Auf diesen Überblick zu Exploitation und Exploration in der Persönlichkeit von Individuen, ihrem Denken und den zugrundeliegenden neuronalen Schaltkreisen bauend, können wir schlussfolgern, dass Individuen sowohl als Reaktion auf Ihre Umwelt exploitative oder explorative Strategien oder deren Kombination wählen, aber auch stabile Neigungen hin zur einen oder anderen Strategie zeigen (DeYoung et al., 2002; DeYoung, 2015). Und so ist es auch bei Führungskräften. Für die Unternehmensführung ergeben sich daraus eine Reihe wertvoller Anknüpfungspunkte und Implikationen, sowohl für die Führung *in* als auch die Führung *von* Organisationen.

##### *2.4.1 Führung von Organisationen: Organisationen explorieren, weil Führungskräfte explorieren*

Führung von Organisationen befasst sich mit der Ausrichtung der gesamten Organisation. Welche Ziele verfolgt die Organisation und mit welcher Strategie können diese am besten erreicht werden. Ein zentraler Aspekt der strategischen Unternehmensführung ist ihre Ausrichtung hin zu mehr Exploration oder Exploitation. Ein Unternehmen kann entweder viel Wert auf Veränderung und Innovation legen (Exploration), die bestehenden Prozesse optimieren, um sie effizienter zu gestalten und Kosten zu senken (Exploitation) oder eine Balance zwischen beiden versuchen (Ambidextrie, oder „beidhändige“ Führung). Die Ausrichtung eines Unternehmens wird maßgeblich von der strategischen Führungskraft beeinflusst. Wenn die strategische Führungskraft eines Unternehmens dazu neigt zu explorieren, wird auch die strategische Orientierung des Unternehmens eher explorativ ausgerichtet sein, und somit wird mehr Wert auf Innovation gelegt (Harrison et al., 2020; O'Reilly & Tushman, 2011).

Bestehende Managementliteratur, die Organisationen untersucht, welche sich der Herausforderung stellen, Exploitation und Exploration zu betreiben, um im Wettbewerb zu bestehen (Vera & Crossan, 2004) beschreibt, dass Exploitation mit Effizienz, mechanistischen Strukturen, Verfeinerung, Bürokratie und Stabilisierung in Verbindung gebracht wird, während sich explorative Tendenzen in organischen Strukturen, Improvisation und Experimentieren zeigen (Lyytinen & Rose, 2006; March, 1991). Da sich beide Strategien auf unterschiedliche organisatorische Prozesse und Strukturen stützen, können ihre Auswirkungen auf die Leistung einer Organisation im Laufe der Zeit erheblich variieren (He & Wong, 2004). Exploitation führt kurzfristig oft zu positiven Effekten wie der effizienten Nutzung von Ressourcen und der Steigerung der Effizienz (Raisch & Birkinshaw, 2008). Allerdings zeigt eine langfristige Betrachtung von Exploitation ein anderes Bild auf. Organisationen, die sich stark auf Exploitati-

on stützen, verlieren die Fähigkeit dynamisch auf ihre sich verändernde Umgebung zu reagieren, was ihren Erfolg langfristig gefährden kann. Um die Fähigkeit eines Unternehmens zur Anpassung an den Wandel zu verbessern, müssen daher Exploration und Exploitation im Gleichgewicht sein (Danneels, 2002). Unternehmen, welche die beiden Strategien – Exploration und Exploitation – erfolgreich kombinieren können, werden als beidhändig oder ambidexter bezeichnet (Duncan, 1976; Jansen et al., 2006; Levinthal & March, 1995; Tushman & O'Reilly III, 1996). In diesem Zusammenhang haben Wissenschaftler die paradoxen Spannungen der Ambidexterität (Hughes, 2018), Umweltaspekte der explorativen und exploitativen Aktivitäten (Jansen et al., 2006) und Antezedenzen der organisatorischen Ambidexterität (Gibson & Birkinshaw, 2004) erforscht. Wie jedoch zuvor dargestellt, entsteht Unternehmensstrategie nicht im luftleeren Raum, es sind strategische Führungskräfte welche die Strategie für Ihre Unternehmen entwickeln und implementieren.

Aufbauend auf der Upper-Echelons-Theorie (Hambrick, 2007; Waldman et al., 2004) zeigt sich, dass kognitive und Persönlichkeitsmerkmale von strategischen Führungskräften einen erheblichen Einfluss auf das Ergebnis eines Unternehmens haben (Cannella et al., 2009; Colbert et al., 2014). Diese Auswirkungen zeigen sich direkt oder indirekt über Mediationen (Colbert et al., 2014; Malhotra et al., 2018). Die Eigenschaften von Führungskräften beeinflussen den kognitiven Rahmen, wenn sie strategische Entscheidungen treffen (Gupta et al., 2017; Hambrick, 2007; Hambrick & Mason, 1984). Dementsprechend heben Studien Eigenschaften wie Hybris, Selbstüberschätzung oder Narzissmus (Chatterjee & Hambrick, 2007; Chen et al., 2015) und deren Einfluss auf strategische Handlungen (z. B. Akquisitionsaktivitäten, Kapitalzuweisungen, Produkteinführungen) hervor (Chatterjee & Hambrick, 2007, 2011; Gamache et al., 2015). In diesem Sinne stellen Hambrick & Mason (1984) fest, dass die strategische Ausrichtung eines Unternehmens die Ausrichtung seiner strategischen Führungskraft widerspiegelt. Folglich unterscheidet sich die strategische Ausrichtung von Unternehmen aufgrund ihrer strategischen Führungskräfte (Harrison et al., 2019). Obwohl Erfahrung, Betriebszugehörigkeit, Alter oder Geschlecht eine Rolle spielen, bietet die Persönlichkeitsforschung die beste Beschreibung der interindividuellen Unterschiede zwischen Menschen.

Blicken wir zurück auf die Organisation unseres Denkens und unserer Persönlichkeit. Persönlichkeitsmerkmale die ein Individuum eher zu Plastizität oder Stabilität neigen lassen, formen das Verhalten. So ist es auch bei strategischen Führungskräften und ihrer Präferenz eine eher exploitative oder explorative Strategie zu wählen. Strategische Führungskräfte mit

hoher Stabilität sind tendenziell verträglich (stabile soziale Beziehungen), emotional stabil (stabile Affektivität) und gewissenhaft (aufgabenbezogene Stabilität; DeYoung, 2010; Digman, 1997; Hirsh et al., 2010). Stabile Führungskräfte sind auch solche, deren Präferenz im Bewahren bestehender Ressourcen und Prozesse liegt, sodass ihr Fokus auf das bestehende Geschäftsmodell gerichtet ist. Tatsächlich zeigen gewissenhafte Führungskräfte eine größere strategische Rigidität und investieren weniger wahrscheinlich Ressourcen in Sektoren, die ein gewisses Maß an Unsicherheit aufweisen (Benischke et al., 2019; Herrmann & Nadkarni, 2014; Nadkarni & Herrmann, 2010). Dagegen sind Führungskräfte mit hoher Plastizität extrovertierter und offener, sie sind kontaktfreudig, suchen nach Erregung und neuen Erfahrungen (Ashton et al., 2002; Costa & McCrae, 1992 a; Costa & McCrae, 1992 b; Eaves & Eysenck, 1975). Sie besitzen ein hohes Maß an Neugier und eine größere Bereitschaft, neue Fähigkeiten zu erlernen (Costa & McCrae, 1992 b). Tatsächlich zeigen Studien, dass Extraversion die Arbeitsleistung (z. B. im Verkauf) oder eine effektivere Führung vorhersagen kann. Die Extraversion von Führungskräften beeinflusst die Verhaltensintegration (Araujo-Cabrera et al., 2017) und die Risikobereitschaft (Harrison et al., 2020) des Spitzenmanagements positiv. Auf der anderen Seite motiviert das Lösen von Problemen und die Arbeit an Herausforderungen aufgeschlossene Personen (Christensen et al., 2020; Datta et al., 2005; Heinström, 2005). Tatsächlich meistern hochgradig offene Personen ungewohnte Situationen, lösen Probleme durch das Ausprobieren neuer Ansätze und lehnen vorgegebene (Organisations-)Strukturen ab (McCrae & Sutin, 2009).

Der Person-job fit beschreibt, wie sehr eine Person, ihre Fähigkeiten, ihre Persönlichkeit und ihre Denkmuster zu ihrem Beruf oder einer Stelle passt. Ein hoher Person-job fit geht mit hoher Leistung und Zufriedenheit einher (Resick et al., 2007). Das Konzept des Person-job fit ist evidenzbasiert und konnte sich in der Managementliteratur etablieren (Kristof-Brown et al., 2005). Da strategische Führungskräfte eine starke Auswirkung auf die strategische Ausrichtung eines Unternehmens haben, ist es wichtig, dass strategische Führungskräfte einen hohen fit mit der Strategie ihres Unternehmens aufweisen. Umgekehrt muss bei der Selektion und Besetzung einer neuen strategischen Führungsposition die strategische Orientierung des Unternehmens in Betracht gezogen werden, wenn nicht sogar das kritische Entscheidungskriterium sein. Da die neue Führungskraft nach innen und strategisch so führen wird, wie es ihre persönliche Präferenz empfiehlt. Entscheidungsträger des Unternehmens können bei der Selektion einer neuen Führungskraft also maßgeblich darauf einwirken, ob die Position mit einer Person besetzt wird die eher explorativ oder ex-

exploitativ agiert. Somit ist es bei dieser Entscheidung essentiell je nach Strategie eine Person mit Explorations- oder Exploitationstendenzen zu wählen, die mit der gewünschten zukünftigen strategischen Orientierung der Organisation übereinstimmen.

#### 2.4.2 Führung in Organisationen: Exploration und Exploitation, als schließendes und öffnendes Führungsverhalten

Wie auch bei der Führung von Organisationen spielt der Exploration / Exploitation trade-off bei der Führung in Organisationen eine wichtige Rolle. Exploration und Exploitation stellen zentrale Ordnungskategorien dar. Führung kann das Paradoxon beinhalten, die Kontrolle aufrechtzuerhalten und die Kontrolle loszulassen. Während traditionelle Vorstellungen, die klassisch mit wissenschaftlicher Managementforschung in Verbindung gebracht wurden, die Kontrolle durch das Management betonten, legen neuere Ideen die Notwendigkeit nahe, die Kontrolle aufzugeben und den Mitarbeitenden mehr Autonomie zuzugestehen. Ein Ansatz zum Empowerment der Mitarbeitenden besteht beispielsweise darin, Aufgaben von Führungskräften auf Mitarbeitende zu übertragen respektive diese zu delegieren. Zu diesen Managementkomponenten zählen Entscheidungsbefugnis, Informationen zu Unternehmensstrategie und Finanzen sowie die Befugnis andere zu führen (Bowen & Lawler, 1995). Weitere solche Verhaltensweisen sind das Zulassen von Fehlern, das Ermutigen zum Experimentieren und das Gestatten von Raum um unabhängiges Denken und Handeln der Mitarbeitenden zu ermöglichen. Solches Führungsverhalten wird als Öffnungsverhalten von Führungskräften bezeichnet und erhöht die Varianz im Verhalten der Mitarbeitenden (Rosing et al., 2011) und stellt die Grundlage für Explorationsaktivitäten dar (Gupta et al., 2006; March, 1991; Kearney et al., 2019). Das Umfeld, mit dem sich Führungskräfte zunehmend konfrontiert sehen, scheint ein solches Empowerment zu fördern, da die Erwartungen der Mitarbeitenden hoch sind und es für Führungskräfte zunehmend schwieriger wird, die verschiedenen Elemente der dynamischen Umwelt von Unternehmen in Gänze zu beherrschen und zu kontrollieren (Waldman & Bowen, 2016). Auf der anderen Seite steht einengendes oder schließendes Führungsverhalten, welches die Varianz im Verhalten der Mitarbeitenden reduziert und somit zu Exploitationsverhalten führt. Zu diesen einengenden Verhaltensweisen zählen das Festlegen von Routine, rigide Kontrolle, Einhaltung von Regeln und die Überwachung von Zielerreichung sowie die Ergreifung von Korrekturmaßnahmen, sollten die zuvor abgesteckten Ziele nicht erreicht werden (Rosing et al., 2011). Wenn eine Führungskraft in der Lage ist sowohl Öffnungsverhalten als auch Schließungsver-

halten zu zeigen führt dies durch gleichzeitiges Abgeben und Behalten von Kontrolle zu einer Verbesserung der Innovationsaktivität (Zacher & Rosing, 2015).

Zusammenfassend lässt sich sagen, dass die Paradoxtheorie einen neuartigen und einzigartigen Ansatz für die Personalführung darstellt, der zwei unterschiedliche, jedoch komplementäre Verhaltensweisen skizziert, durch die Führungskräfte das Explorations- und Exploitationsverhalten ihrer Mitarbeitenden fördern können. Wenn eine zu Stabilität tendierende Führungskraft mit einer Strategie kämpft, die ein bestehendes, rentables und daher verstärktes Geschäftsmodell erneuern soll (Exploration), wird dieselbe Führungskraft nicht nur weniger Öffnungsverhalten zeigen, sondern dieses sogar aktiv vermeiden. Ist die Strategie hingegen ein Spiegel der Führungskraft die sie formuliert, so ist es das tägliche Führungsverhalten umso mehr. Tatsächlich sind es offene und extrovertierte Führungskräfte die veränderungsorientierte Führung und dabei im besonderen Öffnungsverhalten zeigen (Bono & Judge, 2004), wohingegen gewissenhafte Führungskräfte transaktional führen und damit mehr Schließungsverhalten zeigen (Bono & Judge, 2004). Ebenso wie bei der Führung von Unternehmen, ist der Person-job fit und dessen Erfüllung für die Führung in Organisationen ebenso gültig und ergänzt die Perspektive auf die Führung von Unternehmen aus einer Perspektive die das Individuum in den Mittelpunkt stellt. Wichtig ist dabei hervorzuheben, dass die Persönlichkeit dabei auch eine Präferenz für Umwelten beschreibt. In anderen Worten, eine stabile Führungskraft, mit der Neigung ordnungsliebend zu sein, wird sich unwohl fühlen in einer Organisation ohne klare Strukturen und einem dynamischen Marktumfeld, das viel Erneuerung einfordert. Umgekehrt wird eine plastische Führungskraft mit dem Bedürfnis nach intellektueller Stimulation und Neues zu erschließen, sich in einer Organisation mit klaren Hierarchien, hoher Formalisierung und Zentralisierung fehl am Platz fühlen. Über die persönlichkeitsgebundene Präferenz hinaus besteht die Gefahr, dass strategische Führungskräfte bei einer fehlenden Passung an die Organisation maladaptive Maßnahmen einleiten. So könnten sie organisch organisierte Einheiten überstrukturieren, mit Schließungsverhalten führen, welches die Varianz im Verhalten der Mitarbeitenden verringert und sie so ihres Innovationspotentials berauben, oder umgekehrt klar strukturierte Einheiten in ihren Prozessen und ihrer Struktur flexibilisieren, die Varianz im Verhalten der Mitarbeitenden erhöhen und so das Ziel reliabler Ergebnisse sabotieren. Beides kann gegenläufig zur Strategie des Unternehmens sein, welche die Organisation des Unternehmens oder Teile davon formt.



## 5 Soziale Exploration und Exploitation: Gruppen und Umwelt

### 3.1 Organisation: Organisieren von Gruppen zur Förderung von Exploration oder Exploitation

Soziale Faktoren bei Kompromissen zwischen Exploration und Exploitation werden in der Literatur zur menschlichen Entscheidungsfindung oft übersehen (für aktuelle Ausnahmen siehe Goldstone, Ashpole & Roberts, 2005; Phillips, Hertwig, Kareev & Avrahami, 2014). In ihren natürlichen Umgebungen handeln Individuen jedoch selten isoliert von anderen, und die Kompromisse zwischen Exploration und Exploitation können auf Gruppenebene anders ausfallen als bei der Betrachtung eines einzelnen Individuums. In der Literatur zum organisationalen Lernen wird beispielsweise darauf hingewiesen, dass es für eine Organisation leichter sein könnte, gleichzeitig ein Gleichgewicht zwischen Exploration und Exploitation herzustellen als für ein einzelnes Individuum (Gupta et al., 2006). Auch die Untersuchung von Arten mit sozialer Nahrungssuche, wie z. B. Ameisen, deutet darauf hin, dass Gruppen von Tieren den Kompromiss zwischen Exploration und Exploitation für einzelne Individuen reduzieren, indem sich die Individuen entweder auf Exploration oder Exploitation spezialisieren und zusammenarbeiten (Cook et al., 2015). Die Individuen zeigen hierbei aber die Flexibilität, ihre Rolle zu wechseln. Bei Ameisen, steigt der Anteil derer die sich auf Exploration fokussieren, wenn nicht genügend Futterplätze vorhanden sind, die von den exploitenen Individuen geerntet werden können (Beekman et al., 2007). Die Fähigkeit von Individuen, von anderen entdeckte Ressourcen zu nutzen, führt zu einem zusätzlichen Kompromiss zwischen Exploration und Exploitation, der über den für Individuen bestehenden Kompromiss hinausgeht. Eine zweite Möglichkeit, wie soziale Systeme den Kompromiss zwischen Exploration und Exploitation beeinflussen, besteht darin, die zugrundeliegende Konnektivität zwischen den Individuen zu verändern und so die Fähigkeit der Individuen, sich gegenseitig sozial zu beeinflussen, zu manipulieren. Der optimale Grad der Konnektivität hängt hierbei jedoch von der Struktur des Suchproblems ab. Bei der Suche in Umgebungen mit wenigen, dafür starken Spitzen in der Ressourcenverteilung haben Experimente an Menschen und Simulationen ergeben, dass stark verbundene Gruppen besser abschneiden als weniger gut verbundene Gruppen. Wenn die Umgebungen jedoch mehrspurig und rauer werden, die Ressourcenverteilung also mehr, dafür weniger stark ausgeprägte Spitzen hat, führen weniger gut verbundene Kommunikationsnetze zu längeren Erkundungs-

zeiten und besseren langfristigen Lösungen (Mason et al., 2008; Lazer & Friedman, 2007).

Zwei Schlüsselfaktoren, welche Exploration und Exploitation im sozialen Umfeld beeinflussen, sind Wettbewerb und soziale Informationen. Im Allgemeinen erhöht der Wettbewerb die Kosten der Exploration, da er das Risiko birgt, dass andere Individuen die Ressourcen vor einem selbst ausbeuten (Goldstone et al., 2005). Folglich ist es sinnvoll, dass Individuen ihre Exploration einstellen und früher zum Exploiten der Ressourcen übergehen, wenn es Konkurrenten gibt. Gleichzeitig kann die Erkundung in solchen Wettbewerbssituationen jedoch besonders nützlich sein, da sie dem Individuum helfen kann, Optionen zu finden, die seine Konkurrenten nicht nutzen oder nicht nutzen können. Das Vorhandensein sozialer Informationen senkt dagegen tendenziell die Kosten der Erkundung, da das Individuum von den Entscheidungen und Leistungen anderer lernen kann und dadurch die Notwendigkeit verringert, sich selbst auf riskantes Erkundungsverhalten einzulassen (Valone, 2007). Ein dritter sozialer Faktor wird relevant, wenn der Suchende mit anderen, die ebenfalls auf Entdeckungsreise sind, gemeinsame Entscheidungen treffen muss (z. B. Todd & Miller, 1999). Am deutlichsten wird dieser Faktor bei der Partnerwahl, wo die Fähigkeit eines Individuums, potenzielle Partner zu explorieren oder exploiten, oft durch die Bereitschaft des Partners, sich auf eine solche Interaktion einzulassen, eingeschränkt wird. Dieser Faktor spielt aber auch in anderen Situationen gegenseitiger Suche und Wahl eine Rolle, wie z. B. bei der Arbeits- oder Wohnungssuche, wo zwei Parteien übereinstimmen müssen, damit die Suche erfolgreich abgeschlossen werden kann.

Auch Unternehmen und ihre Mitglieder bilden gemeinsam eine soziale Gruppe, welche den Kompromiss zwischen Exploration und Exploitation balancieren muss. Je nach der strategischen Ausrichtung des Unternehmens ist es wirksam bei den Organisationsmitgliedern, durch soziale Faktoren, eher Exploration oder die Exploitation zu fördern. Hierbei können wichtige Parallelen und Implikationen der Verhaltensforschung auf die Führung in Organisationen angewandt und übertragen werden.

#### 3.1.1 Führung in Organisationen: Strukturen und Prozesse bestimmen die Orientierung

Die Art und Weise wie ein Unternehmen strukturiert ist, welche Kommunikationskanäle genutzt werden und wie Individuen entlohnt werden bilden soziale Faktoren innerhalb der Organisation, die sich auf das Verhalten der Mitarbeitenden auswirken und sie zu mehr Exploration und Exploitation veranlassen. Es ist hierbei wichtig, diese sozialen Faktoren auf die stra-

tegische Ausrichtung der Organisation abzustimmen. Sollte dies nicht der Fall sein agieren die Mitarbeitenden entgegen der Ausrichtung des Unternehmens, wodurch weitreichende Probleme entstehen können.

Die Wirksamkeit der sozialen Prozesse die wir bei der Exploration und Exploitation sozialer Gruppen aus der Verhaltenswissenschaft entdeckt haben, sind auch in der Unternehmensführung wirksam. So beeinflussen etwa flache Hierarchien, organische Strukturen und Entlohnungssysteme den Exploration / Exploitation trade-off. Faktoren, welche die Exploration, und dadurch auch die Innovation in einem Unternehmen fördert, sind erstens, flache Hierarchien, diese erweitern die Kontrollspanne einer Führungskraft, indem mehr Personen durch eine Führungskraft geführt werden. So wird starke Formalisierung von Strukturen und Prozessen verhindert und Verhaltenskontrolle der Mitarbeitenden durch die Führungskraft reduziert. Das Verhalten der Mitarbeitenden in der Organisation wird von formalen Prozessen entknüpft und sie erhalten mehr Freiraum, um neue Ideen zu entwickeln und umzusetzen (Robbins & Judge, 2018). Dieser Prozess steigert somit die Exploration und die Innovation im Unternehmen, da er Verhaltenskontrolle reduziert und so mehr Varianz im Verhalten der Mitarbeitenden erlaubt, vorausgesetzt die verringerte Verhaltenskontrolle durch die zentrale Führungskraft wird nicht durch Formalisierung kompensiert. Ein zweiter Faktor, welcher die Exploration fördert, sind organische Strukturen im Unternehmen. Beim Einsatz organischer Strukturen, werden klare Grenzen zwischen Abteilungen und Teams aufgehoben, was zu fließenden Übergängen zwischen Teams und Abteilungen führt, und die Interaktion und Kollaboration zwischen Teams und Abteilungen erhöht (Hull & Hage, 1982). Die Extremform dieser Aufhebung von Grenzen ist die Hocracy, bei welcher Autorität und Entscheidungsgewalt von Führungskräften durch selbstorganisierende Teams ersetzt werden. Ein Individuum ist durch die organischen Strukturen im Unternehmen weniger Funktions- und Zweckgebunden und das Verhalten des Mitarbeitenden wird von steifen Prozessen und Strukturen entkoppelt, da keine festen Rollenmodelle und keine Formalisierung der Rolle des Mitarbeitenden besteht. Durch den Raum der den Mitarbeitenden so zugestanden wird und die Interaktion der verschiedenen Abteilungen und Teams erhöht sich das Explorationsverhalten und die Innovation (Hull & Hage, 1982; Damanpour & Aravind, 2012). Wenn Individuen hingegen in direkte Relation zueinander gesetzt werden, wie es zum Beispiel durch die Anwendung eines Pay for Performance Modells geschieht, bei dem Mitarbeitende, welche hohe Leistungen (Verkaufszahlen, Produktionsstückzahlen, etc.) abliefern, Bonuszahlungen erhalten, sinkt die Wahrscheinlichkeit von Explorationsverhalten und Innovationsaktivitäten. Solche

Bezahlssysteme sind daher besonders geeignet für Funktionsgruppen, die Individualleistungen fördern wollen, und wenig Wert auf Innovation legen, wie es im Verkauf oder Vertrieb oft der Fall ist.

#### 4 Konklusion

Die widerläufigen Mechanismen Exploitation, dem Nutzen bestehender Ressourcen und Prozesse, und Exploration, dem Suchen neuer Ressourcen und Prozesse, stehen sich als Gegensatzpaar auf vielen Ebenen tierischen und menschlichen Verhaltens gegenüber. Diese dichotome Perspektive beschreibt eine Vielzahl adaptiver Mechanismen bei Tier und Mensch; so etwa unsere visuelle Wahrnehmung, die Veränderung unseres Denkens über die Lebensspanne, die Abstimmung von Verhalten in sozialen Gruppen, bis hin zur strategischen Organisation ganzer Unternehmen. Tatsächlich verhalten sich auch Unternehmen in dynamischen Märkten genau entlang dieser Mechanismen von Exploration und Exploitation. In dieser Arbeit konnten wir zeigen, wie dieses Paradox aus der Verhaltensforschung auch für die Unternehmensführung Implikationen hat. Die Erkenntnisse der Verhaltensforschung können genutzt werden um den Wechsel zwischen Exploration und Exploitation in der Führung in und von Unternehmen besser zu verstehen.

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