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Demands, Stressors, and Resources in Co-Configured Project Work: Case Study of a Construction Company**

Abstract

Working in projects constitutes a modern form of operational performance. Projects promote cooperation, enable a high degree of autonomy, and are thus, in contrast to Tayloristic forms of work, regarded to have rather positive impacts on the employees' health and well-being. First studies, however, also point out pathological effects. This article examines specific demands, stressors, and resources of employees working in co-configured projects in particular. Co-configured projects are characterized by the joint production of complex, tailor-made goods and services by different partners. Using the case study of a construction company, we show that co-configured project work is characterized by the complex interaction of demands, stressors, and resources. From the perspective of the interviewed project workers, demands, stressors, and resources are ambivalent. We identified three different types of ambivalences that will be discussed. Based on this, we will deduce implications for future research.

Keywords: project work, co-configuration, co-configured projects, case study
(JEL-Codes: M12, L20, L22)

Introduction

Temporary organizational forms (Bakker, 2010; Bakker, DeFillippi, Schwab, & Sydow, 2016), especially *projects*, are one option for organizations to respond to current challenges such as globalization, new technologies, and increasing and rapidly changing customer demands. Such environmental changes have led to a growing uncertainty and complexity for organizations. Projects are intended to meet the increasing difficulties to forecast and plan successful corporate actions, and the growing demands for flexibility (e.g., Ferreira, Braun, & Sydow, 2013; Hobday, 2000;

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Ligthart, Oerlemans, & Noorderhaven, 2016; Lindkvist, 2004; Lundin & Söderholm, 1995; Sydow, Lindkvist, & DeFillippi, 2004). Empirical studies confirm the considerable increase and prevalence of project work in organizations across different sectors (e. g. Bakker et al., 2016; Eichhorst & Tobsch, 2014; Leufkens & Noorderhaven, 2011; Whittington, Pettigrew, Peck, Fenton, & Conyon, 1999). It is particularly used when dealing with new, complex tasks that cannot be solved as a matter of routine (Bollinger, 2001; Gerlmaier, 2004).

Projects are increasingly characterized by *co-configuration* (e. g. Engeström, 2004). Co-configuration refers to the joint production of complex, tailor-made goods and services by internal (partners from the same organization), but also external partners (e. g. cooperating companies, customers, or suppliers). During the work process, these products and services are adapted to customer demands (Engeström, 2005; Faßauer & Geithner, 2016; Virkkunen, 2006). As part of co-configured projects, companies thus act in different multi-organizational networks with changing project partners along the supplier-customer chain.

Compared to traditional, functionally structured organizations, working in co-configured projects implies modified working conditions for employees. Self-organization, novelty, and a permanent adaptation to constantly changing demands replace hierarchy, instructions, and the processing of recurring tasks (Gerlmaier & Kastner, 2003; Latniak & Gerlmaier, 2006). Thereby, projects are often regarded to offer good opportunities for cooperation and a high degree of autonomy thus representing a health-promoting activity (Gerlmaier & Latniak, 2007, 2013). In fact, first studies show that particularly skilled project workers with a high degree of autonomy experience a growing intensification (increasing workload, time constraints) and extensification (overtime, blurring of boundaries between work and private life) of work (Latniak & Gerlmaier, 2006). This leads to tendencies like increased self-exploitation, restrictions in private life, and enhanced attrition of human resources (Bollinger, 2001; Gerlmaier, 2004).

Empirical research, especially of working conditions in the modern working world and their impact on employees and their health, is still scant (Theorell et al., 2015). Thus, despite the factual relevance of project work, studies on its stress-related aspects still remain rare and are predominantly focused on IT projects (see e. g. Bollinger, 2001; Borg & Söderlund, 2014; Latniak & Gerlmaier, 2006; or Mühlfelder, 2004). Moreover, empirical research on co-configured project work is entirely missing. Considering the increasing implementation of co-configured project work (e. g. Engeström, 2004), this is problematic as this modern form of working in projects includes specific conditions of work. Therefore, it can be assumed that workload and health risks are even more pronounced in co-configured project work where project team members do not only have to coordinate with employees from their own organization but additionally with various external partners.

Co-configured project work may thus go along with specific demands, stressors, and resource constellations as well as respective health risks accordingly.

This article addresses this research gap, by providing an explorative, qualitative analysis of co-configured project work, based on the case study of a German construction company. Referring to the Demand-Stressor-Resource Model (Zapf, 1993; Zapf & Semmer, 2004; Clasen, 2012), the *aim of our study* is to explore the demands, stressors and resources and their relationships to each other in co-configured project work. By identifying three different *types of ambivalence*, the article contributes to a better understanding of stress-related work aspects in co-configured project work.

The article starts with a brief overview of co-configured project work and then explains our theoretical framework based on the Demand-Stressors-Resource Model (Zapf, 1993; Zapf & Semmer, 2004; Clasen, 2012). Thereafter, we describe the empirical research design. After the presentation and discussion of the main findings, we deduce implications for further research.

Conceptual Background

Co-Configured Project Work

Co-configuration is a type of work aimed to create customer-intelligent products and services which adapt to the changing needs of the user (Engeström, 2004). Victor and Boynton (1998) first used the term 'co-configuration' when providing a framework of historical forms of work:

> 'The work of co-configuration involves building and sustaining a fully integrated system that can sense, respond, and adapt to the individual experience of the customer. When a firm does co-configuration work, it creates a product that can learn and adapt, but it also builds an ongoing relationship between each customer-product pair and the company. [...] The company then continues to work with this customer-product pair to make the product more responsive to each user. In this way, the customization work becomes continuous [...] a living, growing network develops between customer, product, and company' (Victor & Boynton, 1998, p. 195).

Based on that initial description by Victor and Boynton (1998), main characteristics of co-configured project work include the following (Engeström, 2004; Faßauer & Geithner, 2016; Virkunnen, 2006):

- *flexible adaptation*: adaptive 'customer-intelligent' products or services, and integrated, customized product/service combinations emerge over lengthy periods of time;
- *network*: continuous relationships of mutual exchange between customers, producers, other cooperation partners, and the product/service combinations, which goes along with
- *multiple perspectives and poly-contextuality:* customers and collaborating producers are actively involved and give input to the configuration (multiple perspectives);

they have different backgrounds, perspectives, and contexts that need to operate in networks within or between organizations (poly-contextuality).

Co-configured project work is thus a demanding mode of work as it includes interdependencies between multiple partners (Engeström, 2004). The more partners included, and the more an employee works in different co-configured projects at the same time, the more he or she has to deal with different meanings, perspectives, and contexts. However, co-configuration also offers mutual learning and innovation opportunities and thus strategic advantages for organizations (Engeström, 2004).

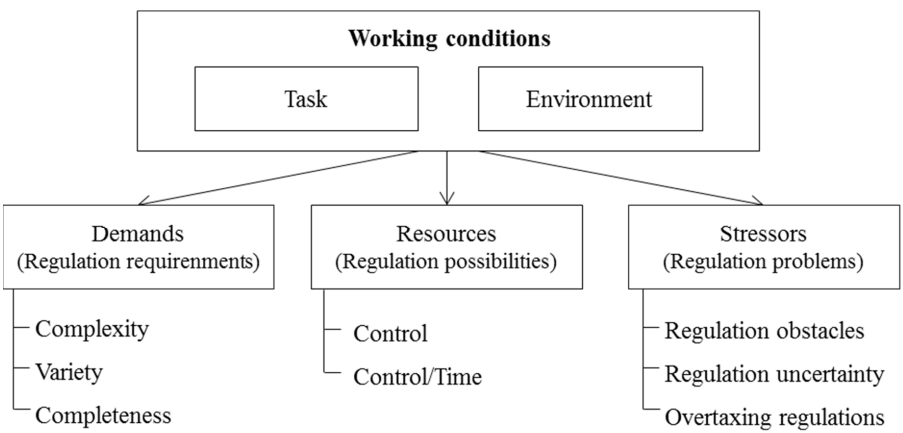
Co-configured project work is particularly employed by companies with a *project-based organization.* Project-based organizations are common in various industries, like consultancy, software, construction, or engineering (Alvesson, 1995; Bakker, 2010; Grabher, 2004; Ligthart et al., 2016; Winch, 1989). Their original mission is to carry out external projects for customers. Project-based organizations use projects as the central coordination form for their market activities (Bredin, 2008; Hobday, 2000). They have a project-oriented organizational structure (Bresnen, Goussevskaia, & Swan, 2004), which is mostly completed by a permanent (functional) structure for supportive, cross-project routine tasks (Blindenbach-Driessen & van den Ende, 2006; Thyssen, 2011). Project-based organizations simultaneously work on various, often co-configured, projects that involve different partners, durations, and demands. Staff members are normally permanently employed with the company and spend most of their working time in changing temporary project constellations (Bredin, 2008; Leufkens & Noorderhaven, 2011).

Against this backdrop, co-configured project-work is assumed as very demanding for project workers. Previous studies on stressors and health-relevant aspects of project work are relatively limited in number. The few analyses of demands, stressors, and resources of project work centre upon the IT sector (Gerlmaier & Kastner, 2003; Gerlmaier & Latniak, 2007, 2013; Latniak & Gerlmaier, 2006), or focus on individual stress aspects across different sectors (e. g. Gällstedt, 2003; Zika-Viktorsson, Sundström, & Engwall, 2006). Studies about project work in the IT sector, for example, reveal disproportionately high number of cases of mental exhaustion and stress-associated illnesses (Gerlmaier & Latniak, 2007; 2013; Latniak & Gerlmaier, 2006), which can lead to reduced performance and social conflicts (Kordt, 2014; Udris & Frese, 1999). Particularly project-based organizations can be faced with severe negative consequences of the mental stress of their employees. It can be proposed that workload and health risks are even more pronounced in co-configured project work, where project team members do not only have to coordinate with employees from their own organization but additionally with various external partners. However, so far there has been no detailed overview of concrete demands and stressors with respect to co-configured project work.

Demand-Stressor-Resource Model

Various theoretical models (see e. g. Job Demand-Control Model, Karasek, 1979; Effort-Reward-Imbalance Model, Siegrist, 1996, 2002; Siegrist & Wahrendorf, 2016; Job Demands-Resources Model, Bakker & Demerouti, 2006) are used to investigate demands and health-relevant aspects of work (Böckelmann & Seibt, 2011; Dunckel, 1999; Ganster & Rosen, 2013; Rau & Buyken, 2015; Stansfeld & Candy, 2006; Theorell et al., 2015). We adopt the *Demand-Stressors-Resource Model* (Zapf, 1993; Frese & Zapf, 1994; Zapf & Semmer, 2004; Clasen, 2012) as the theoretical framework of our study. This model is based on the Transactional Stress Theory (Lazarus & Folkman, 1984) as well as the Action Regulation Theory (Frese & Zapf, 1994) and examines work characteristics in terms of their impact during stress regulation as *demands* (regulation requirements), *stressors* (regulation problems), or *resources* (regulation possibilities) (see Figure 1). We chose the Demand-Stressors-Resource Model because it bears considerable potential to integrate a broad range of assumptions and research findings on health-related aspects of work. This is relevant in the context of co-configured project work because it is a modern working form with specific, so far barely investigated, working conditions. Moreover, the model allows for the differentiation between demands and resources. This way, demands, stressors, and resources are to be understood as basic analytical dimensions whose particular content can be specified depending on the empirical area (Clasen, 2012; Semmer, Zapf, & Dunckel, 1999).

Figure 1: Work characteristics in the Demand-Stressor-Resource Model (based on Zapf, 1993; Frese & Zapf, 1994; Zapf & Semmer, 2004; Clasen, 2012)



The model assumes a focused orientation of human activities and thus conceives stressors as barriers and resources as support factors in the process of targeting an objective (Zapf, 1993; Zapf & Semmer, 2004; Clasen, 2012). *Demands* such as complexity, variety, and completeness of the work task are regarded in a differentiat-

ed way in terms of their effects on the acting person. They are basically attributed positive effects like gain in experience or increased adaptability to new challenges. Too pronounced demands, however, can also have negative effects (Edwards, Kaplan, & Harrison, 2000; Zapf & Semmer, 2004).

Stressors include regulation obstacles, regulation uncertainties, and overtaxing regulations (Zapf, 1993). They are generally attributed a pathological effect. Regulation obstacles (like lacking information with respect to work tasks or bad tools) do not hinder the planning of objectives and activities in the context of a task, but they make it more difficult to pursue a goal and to regulate necessary actions. This is because the concerned person will be forced into additional efforts (e. g. repetition of work steps) or riskier actions, which may produce frustration and anger. Regulatory uncertainties (like contradictory or unclear objectives) lead to a situation where the concerned individuals do not know how a certain goal can be achieved, which kinds of plans are useful, or what feedback is to be trusted (Semmer, 1984). In this case, the individual becomes qualitatively overloaded, which can lead to feelings of fear or worry. Overtaxing regulations (like time pressure or concentration necessities) allow for adequate processing of goals, plans and feedback. However, too little time or too much information lead to a quantitative or informational overload with the concerned person, which complicates the implementation of the regulations (Zapf, 1993; Zapf & Semmer, 2004).

Resources refer to different forms of control at work (e.g., job decision latitude), especially with regard to terms of objectives and approaches (Zapf & Semmer, 2004). They are associated with impaired well-being when less pronounced and to promote well-being when highly pronounced. Despite strong theoretical and empirical links between regulatory demands and regulatory opportunities, Zapf and Semmer (2004) make a deliberate separation. According to the authors, this is necessary since there may be work situations where one category is highly pronounced and another one is less pronounced, e.g., solving a complex problem (high complexity) where there is only one solution (low degrees of job decision latitude).

Against the backdrop of co-configured project work as a modern work form and based on the Demand-Stressors-Resource Model, we aim to answer the research question of which specific demands, stressors, and resources occur in co-configured project work. This question will be discussed by means of the following qualitative case study.

Method

So far there has been no standardized method for analysing the complex work in project-based organizations. Using the tried-and-tested approaches from other fields involves the danger of not asking for important aspects. Semmer (1984) points out that it is necessary to rely on explorative, qualitative, and partly standardized methods, for objects where so far no or only a small degree of prior knowledge exists.

The results of such studies can later serve as a basis for the development of standardized procedures. Hence, we investigated demands, stressors, and resources of co-configured project-work by means of a qualitative case study of a company from the construction sector in Germany (Flick, 2008; Miles, Hubermann, & Saldana, 2014).

Case Study Research

In empirical social science, case studies have a long tradition and play an important role, especially when investigating unknown empirical phenomena (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Siggelkow, 2007; Stake, 2009; Yin, 2013). A case study is not a direct survey method or a uniform research program, but rather an open research approach that can be used to summarize the entire range of survey methods of social research (Lamnek, 2010). By using a case study, the object of investigation can be comprehensively analyzed and not only checked on a point-by-point basis, which also reveals complex cause-effect relationships (Wrona, 2005). Case studies aim to illuminate the specifics of the cases (Siggelkow, 2007).

The deep exploration of the object of investigation is supported by its theoretical as well as methodological openness (Siggelkow, 2007). On the theoretical level, openness means, in particular, that not only the relationships between previously developed hypotheses are examined. Rather, case study research is based on an open question, which allows deep insights into the subject matter under investigation. However, theoretical knowledge of the researcher is not excluded. This may also be used in the data collection but must be approved in advance (in our case the Demands-Stressors-Resources Model). In addition, it should be adapted iteratively to new findings in the research process. In methodological terms, openness means that different methods may be used to investigate the object (Mayring, 2002; Wrona, 2005). With respect to our research, this will be explained after a brief description of the case company. The case company was deliberately selected because it is a project-based organization carrying out co-configured projects with multiple internal and external partners. Thus, the case company is regarded as a typical case or a case considered appropriate for the research question (Eisenhardt & Graebner, 2007; Kelle & Kluge, 2010; Siggelkow, 2007).

Description of the Case Company

The case company is a medium-sized enterprise managed by the owner. It operates in the area of high-class interior construction and interior design. The company's headquarters is located in Germany with various foreign subsidiaries and representative offices. It employs 190 persons and has an annual turnover of more than 45 million Euros. The core business includes the individual and exclusive interior design of yachts (50% of orders), estates, and boardrooms. The company aims to provide all services from a single source. Therefore, certain upstream/downstream or

parallel stages in the value-added process have been gradually integrated in the past years (e. g. design, manufacturing).

The case company is a typical project-based organization completely geared to the realization of different customer projects. It acts as general contractor and has, therefore, to integrate different partners during the implementation of projects; e. g. when building a yacht, this includes the owner (end customer), the shipyard, several architects, and designers, engineering offices, suppliers, and possibly other manufacturers. Thus, co-configured project work is the main type of work there. The central market value is generated by the engineering department within a project-based structure. All further business divisions have a classical line organization, i. e. there are functionally structured divisions below the management level. This includes production and assembly as performing divisions as well as purchasing, HR, tendering, controlling, after-sales service, logistics, and dispatch as support divisions. These functional divisions are systematically oriented towards supporting the projects.

The company mainly realizes large-scale co-configured projects with volumes between one and 20 million Euros. The duration of projects ranges between one and three years. Five to ten projects are operated at the same time. One project team is made up of an average of ten permanent employees. Apart from transition and support phases, they work full time on the projects. Individual solutions are developed according to specific customer requirements, which leads to a high level of novelty between different projects. The manufacturing process often includes adaptations since there may be changes in the requirements due to, e. g. safety reasons (specific use of wood) and needs from customers, designers or other partners.

Data Collection and Analysis

Our analysis is based on various empirical data, which we collected between June 2013 and September 2014. We *observed* several formal project team meetings and informal conversations between team members. We also talked to the employees on an informal basis (e. g. during lunch breaks). The aim was to understand daily work processes and the specifics of co-configured project work in particular. In addition, we analyzed various *documents* such as organizational charts, workshop minutes and reports as well as the project management handbook of the company. 17 *semi-structured interviews* were the main source of data; 13 with project workers (30% of all project workers of the company) and four with managers and functional staff (CEO, CFO, Human Resources, Public Relations). As it is a central aim of case study research to examine an object in its entirety (Lamnek, 2010), we used different data collection methods in order to gain a detailed and holistic overview about the case company, especially its history, organizational structure and culture, work processes, or health management. This allowed us a better understanding of the interaction of the various influencing factors with respect to the development of de-

mands, stressors and resources with the co-configured project work in the case company.

In this article, presented findings on demands, stressors, and resources predominantly refer to the interviews with employees working on projects. One female and twelve male project workers (design engineers, project management, project coordination, tendering, implementation planning) were interviewed. The sample size was determined by theoretical saturation (e. g. Guest, Bunce, & Johnson, 2006; Masen, 2010). The interviewees were between 26 and 47 years old and their period of employment ranged between one and 28 years. We used a semi-structured interview questionnaire with open questions. The interviews were organized in three blocks. Part one focused on questions about the interviewees' personal background (sociodemographic characteristics, career, activities/development in the company, project experience). In the second and central part, interviewees were asked about typical demands, stressors, and resources in their work. Thus, the interview guideline referred to the basic dimensions of the Demand-Stressor-Resource Model (Zapf, 1993; Frese & Zapf, 1994; Zapf & Semmer, 2004; Clasen, 2012). In the third part, the interviewees were encouraged to make suggestions for improvement in relation to their work. Table 1 shows a section of the interview guideline.

All interviews were digitally recorded, completely transcribed, and evaluated by use of qualitative content analysis according to Mayring (2014). Benefiting from the potential of the Demand-Stressor-Resource Model to integrate a broad range of assumptions and previous research findings on health-related aspects of work, we used several sub-categories for the analysis of the three main categories *demands, stressors,* and *resources*, e. g. variety and cooperation requirements for *demands* or time pressure and concentration requirements for *stressors.* Sub-categories and their definitions were thus partly adopted from ISTA (Instrument for Stress-oriented job Analysis, Semmer, 1984; Semmer et al., 1999). Moreover, we added sub-categories referring to social stressors or resources from SALSA (Salutogenic Subjective Work Analysis, Rimann & Udris, 1997) since co-configured project work is a highly interactive work. The sub-category *reward* of the effort-reward-imbalance questionnaire (Siegrist, 1996) was also added as an adequate reward could be especially important in complex work environments like co-configured projects. We aimed, however, to be as open as possible to expand and differentiate our access to the three categories if the empirical material suggested it. This way, the deductive sub-categories were inductively expanded from the material (Miles et al., 2014; Srnka & Koeszegi, 2007). For example, categories like *work-related self-organization*, *responsibility* or *permanent internal change* emerged from the material. By this means, each of the three main categories finally consisted of up to ten sub-categories. Each category was defined in accordance with the requirements for qualitative content analysis and provided with a typical example from the interview statements thus resulting in comprehensive coding guidelines (Mayring, 2014). Table 2 shows examples from the guidelines.

Table 1: Section of the interview guideline

1. Personal background	
1.1	Personal information (e. g. age, material status, education)
1.2	Professional activities (time in the company, function)
1.3	Project work (e. g. since when working in projects, average working time in a project, parallel projects)
2. Demands, stressors and resources	
2.1	General assessment of the work situation (satisfaction, predominantly psychologically/mentally or physically stressful work, psychological stress caused by work in projects)
2.2	General assessment of the demand, stress, and resource situation (general demands, stressors, resources, impact)
2.3	Time pressure
	■ How heavy is your workload? (In comparison to other departments?) ■ How often does work accumulate? ■ How often do you have time pressure? ■ How often do you have to work overtime? ■ How often do you have to work during holidays or at the weekend? ■ How easily can you take breaks during your work?
2.4	Variety[1]
2.5	Work complexity and qualification requirements
2.6	Concentration requirements
2.7	Work interruptions
2.8	Uncertainty
2.9	Cooperation density
2.10	Cooperation requirements
2.11	Cooperation opportunities
2.12	Communication opportunities
2.13	Job decision latitude
2.14	Participation
2.15	Problems in work organization
2.16	Learning and qualification potential of the work
2.17	Knowledge acquisition problems and learning obstructions
2.18	Rewards
2.19	Synchronization problems between work and private life
2.20	Social climate
2.21	Leadership behaviour
2.22	Social support
2.23	Emotional dissonance
3. Other aspects	
3.1	Suggestions for improvements (e.g., regarding work organization, project management)

1 Each of the following categories 2.4 to 2.23 included up to five questions.

Table 2: Section of the coding manual

Category	Sub-category	Description (source)	Example
Demands	Work-related self-organization	Necessity to align your own thoughts, motives, and behaviour due to the goal, because of the high degrees of freedom (inductive)	*'Due to the lack of direct control, you always have to check and push yourself. [...] This is a blessing and a curse at the same time.' (construction manager)*
	Variety	Diversity of demands (ISTA)	*'The work is very, very varied.' (design engineer 3)*
	Work complexity and qualification requirements	Complexity of demands, required training, and training period (ISTA)	*'Especially ... the complexity. You need 2, 3 years until you are good at it and have some experience.' (design engineer 4)*
	Cooperation requirements	Dependence on others - negative aspects of cooperation (ISTA) the need for joint decisions, and mutual information (ISTA)	*'Definitely, there is a compelling necessity to work closely together, to agree, to talk. Otherwise, things go wrong.' (design engineer 2)*
Stressors	Time pressure	High work tempo and volume (ISTA)	*'At the moment I have very high time pressure in the company. Especially in the transition phases where two projects are running.' (design engineer 2)*
	Work interruptions	Interruption by supervisors, colleagues, express orders, etc. (ISTA)	*'The [interruptions] are really a big topic. [...] then you are always pulled out: Can you explain to me, here I've seen something, and there is something. [...] the phone is ringing all day. There is always a certain disturbance in it.' (design engineer 5)*
	Uncertainty	Uncertainty about requirements, work results, consequences of decisions and actions (ISTA)	*'There are often unforeseen problems [...] then afterwards in the implementation which you may previously not even have thought of or expected. [...] in the project business, where everything is new and newly developed, there are often things that you did not expect. Then you have to re-react to it later and generate new solutions again and then, of course, there can also be considerable problems.' (design engineer 4)*

Category	Sub-category	Description (source)	Example
	Synchronization problems between work and private life	Contradictions between work and private life requirements, compatibility problems between work-related and family roles (Gerlmaier & Latniak, 2007)	*'I think when you are new in the company, I also felt that you have really sleepless nights and take the problems home. That's how it is. And then you really think about it because you also bear responsibility for what you do.' (design engineer 5)*
	Permanent internal change	Frequency and scope of change as well as lack of routines (inductive)	*'A major disturbing factor was or still is the constant introduction of new software.' (design engineer 5)*
Resources	Job decision latitude	In relation to decision-making process and sequence of work steps (at task level) (ISTA)	*'I can also influence how things are done. [...] They set the goal, and how I get there, that's up to me.' (design engineer 2)*
	Communication opportunities	Possibility of contact with colleagues and other conversation partners, including non-work-related communication (ISTA)	*'To discuss things, to find solutions when you talk face to face.' (design engineer 3)*
	Positive social climate	Mutual interest, trust, openness, and humour in dealing with other people at work (SALSA)	*'Very open and honest, communicative and there is a very pleasant working climate.' (design engineer 4)*
	Social support	Degree to which colleagues and supervisors are willing to 'lend an ear', help with problems and mutual trust (SALSA)	*'Which goes along with constant support from colleagues. Well, you're not alone at your workplace, and you don't have to work it out on your own. You can always go to your colleagues who are at home in different areas or in a leading position. There you can get impulses and assistance that may help you with your work in a short time.' (design engineer 3)*

The coding was performed by one author. During the coding process, there was a permanent and extensive exchange with the other two authors. Moreover, a second author checked all the coded material for meaningfulness and clarity. In case of unclear statements, consensus was achieved by communicative validation (Kvale, 1995).

Findings

In the case company co-configured project work is marked by the simultaneous occurrence of high and differentiated demands, stressors, and resources, which are interlinked and, in many respects, ambivalent. In the following section, we first describe the main findings for each main category. For a better understanding, respec-

tive sub-categories used in the coding guidelines are italicised. Afterwards, we discuss the findings, especially the ambivalent perception of demands, stressor, and resources.

Demands: 'It's Not Possible to Handle Things in a Standardized Way…'

Participants reported that high *work complexity* and *variety* constitute characteristics of co-configured project work in the case company. The customer-specific services of the company are described as complicated per se because of their high level of novelty and uncertain feasibility. Especially the construction of the interior of a yacht is seen as very challenging since the customers' demands are very high. Thus, each project involves new challenges. Accordingly, team members reported that they constantly have to deal with new requirements:

> 'Well, in this project business I noticed that there are a lot of new things coming up all the time. It's not possible to handle things in a standardized way because they are always new and different. So you always have to generate new solutions, always rethink issues, because things are basically never the same.' (design engineer 4)[2]

Interviewees describe the context of the performance process as 'confusing', as views and specifications of the different internal and external project partners and corresponding *institutional interfaces* have to be pooled, balanced, and linked in the best possible manner. Those interviewed pointed out that very complex and partly contradictory demands have to be technically reflected and combined. This includes the integration of customer wishes (in terms of design and comfort), legal provisions (e. g. safety), and business partners' ideas (e. g. technical feasibility). Especially the project managers need to balance eventualities and make difficult decisions regularly:

> 'And there is also inconsistent information on the part of the designer, owner, customer, and of course the technical divisions, the manufactures, ventilation planning, electrical planning. All this is also coordinated by us.' (design engineer 1)

Participants argued that routines can hardly be developed and that training periods for new employees are long.

The interviewees described that their project work requires creativity, complex problem solving, and *continuous further development* from the team members. Due to regular new projects and personal challenges, the project work is seen as offering very good qualification potentials, which is highlighted as positive. However, some participants also stated that this might change into qualification and performance pressure. Furthermore, the project workers' autonomy and obligation to decide themselves about how and when to complete their tasks is described as posing high demands on the *work-related self-organization*:

2 All quotes are translated from German.

> 'Due to the lack of direct control, you always have to check and push yourself. At that point, you ask yourself: Where am I standing? Where do I get feedback? This is a blessing and a curse at the same time.' (construction manager)

This demand is also mentioned at the personal career level. Many interviewees reported about the necessity for a high level of personal initiative in terms of individual learning, development, and career. Accordingly, it is largely their own responsibility to set themselves development goals and initiate corresponding measures (training courses, development paths). Moreover, they argued that high demands are placed on the marketing of their own person in order to distinguish themselves for higher responsibilities.

Interviewees also considered the high level of individual *responsibility* as an essential demand. They described that their work de facto constitutes the basis for all further operational steps in the company (e. g. procurement of materials, production, and assembly).

At the same time, there is a high interconnection between different tasks in the team. Thus, one's own work is directly linked to the efficiency of individual colleagues and the project team as a whole, and 'there is no other control mechanism because nobody has the time to immerse themselves in these complex things.' (design engineer 5). Additionally, high financial responsibility is described:

> 'Even if you don't always see it like that, as a design engineer you're responsible for the room. Especially in yacht projects. If you take a complicated room, this can amount to 500,000 Euros. And you are responsible for that. If the draft is wrong, it'll be wrongly constructed, wrongly assembled.' (design engineer 1)

Therefore, many team members would welcome stronger monitoring because 'a lack of control can somehow also lead to stress.' (construction manager)

Further demands include *internal cooperation requirements and cooperation density,* which are very pronounced. Close interaction requires coordination, information, and cooperation. At the same time, it offers essential resources (see below). *Team cooperation* was instanced as a further demand, which involves the danger of interpersonal problems and friction and requires the consolidation of different points of view. Some interviewees addressed the problem that in changing project teams, individuals are frequently torn out of their social environment and need to adapt to new persons.

Stressors: 'The Problem Is That Customers Come and Say: "I Really Want to Celebrate Christmas in It." That Creates Stress.'

Interviewees described *time pressure* ('We always have time pressure. [...] relaxation has been rare lately', HR manager) and the associated overtime hours as inherent components of project work, which can partly lead to extreme stress. This is mainly mentioned due to rigid milestones and deadlines as well as the low predictability of the overall performance process:

> 'They [the milestones, author's note] have to be complied with. This has high priority since we have to complete the projects in time. For this, we have time schedules. If we don't stick to the schedule, we don't have to set it up in the first place.' (design engineer 4)

These problems are characterized as additionally being exacerbated by the high (external) dynamics and uncertainty as well as the complexity of the projects (technically demanding market services, many interest groups such as customers, designers, cooperation partners). This may lead to disturbances, which require re-planning and an adaptation of the processes:

> 'The problem is that customers come and say: 'I really want to celebrate Christmas in it'. That creates stress. […] The problem is that we cover only one part, the inner construction, but we are dependent on the things that have to come before. This is not easy because always something goes wrong – you can really bet on it. [...] The difficulty is deficiency, which then needs to be covered at once on short notice.' (functional staff 2)

Time pressure is not only described as a central stress factor but also as leading to further stressors or the depletion of resources. The interviewees reported about *knowledge acquisition problems and learning obstructions* due to time pressure, the taking home of work problems and occasional *synchronization problems* between work and private life. Interviewees confirmed the colleagues' and superiors' generally high willingness to support. However, due to tight schedules, this can hardly be realized.

The high level of *uncertainty* in the work creation process was seen as the main stressor. The work results were described as uncertain because unpredictable problems often occur during the project due to the high degree of innovation and the novelty of demands within a network of collaborators. In addition, participants argue that sudden modification requests by the customers and demands for additional elements can appear at any time. Available solutions have then to be revised or become completely obsolete, which includes a great deal of additional work and time since deadlines cannot be postponed. The disruptive factors are described as hardly calculable and occurring at all stages of the project:

> 'And what also happens, of course, is that there are often unforeseen problems during the implementation. Problems you had not considered or calculated before. Of course, this doesn't happen in such a standardized process where everything is perfectly planned. You know that it works and everything is running smoothly. The project business, where everything is new and newly developed, of course often includes things you had not taken into account before. So you have to react afterwards and generate new solutions, which can, of course, lead to major problems.' (design engineer 4)

The unilateral dependence on the customers is described as an essential factor of uncertainty in such co-configured project work. The wishes of customers 'who just define what they would like to get' (construction manager) have the highest priority. The situation in the case company is particularly complex since the developed solutions, e. g. in terms of the furnishing of yachts, additionally have to comply with safety and technical requirements and the designer's or architect's aesthetic standards. Project members have to balance different ideas without having decision-

making power. The project team rather generates suggestions, which are then accepted by the customer or returned with certain modification requests. The frequency with which details have to be revised is described as unpredictable, the necessary hours of work as hardly calculable:

> 'You make plans, send them to the architect, who then marks everything in red, and you can start again. And this game goes on until they use the green pen and release it. This can take several years. And at some point, you just can't stand it any longer.' (design engineer 1)

Dependence on other cooperation partners is thus described as another uncertainty factor. Participants argued that information or supportive work by external partners are frequently required and are sometimes even essential for the completion of certain tasks. According to the interviewees, cooperation can be impaired by the fact that partners do not deliver work packages at all or not in due time, withhold information, or respond to questions with great delay. Moreover, the variety of different demands on the part of external partners is described as contradictory ('And there is repeatedly contradicting information between designer, owner, customer and of course the trades ventilation and electrical planning.', design engineer 1), which requires additional consultation rounds.

At the task level of individual project members, interviewees described different types of unplanned additional works that have to completed simultaneously with the actual task without additional resources (particularly time) at disposal. This includes sudden stressors inherited from previous projects, the relatively elaborate coaching of new employees, the support of other colleagues and the dealing with documentation and administrative tasks.

Stressors caused by frequent *internal changes* were described by the interviewees as particularly remarkable. This means that permanent internal change such as the frequent introduction of new software or changes in internal structures leads to additional regulatory barriers and overload, which, just like external uncertainty, form the basis for further turbulence. The necessary familiarization, adjustment, and lacking experience in the application take up time that cannot be used for the actual project work. This results in additional work and overtime hours since the tasks have to be carried out anyhow:

> 'Since the very beginning, there has been no project where we used familiar software. Let it be two projects, which are worked through with one software. There is always something improved. But, of course, this is always linked to learning and a trial-and-error effect. So capacities are tied up. [...] And then there are people who give up some time and ask why all this is necessary.' (design engineer 2)

Thereby, permanent change is described as disruptive. However, it is also viewed as a challenge and necessity in order to adapt to changing external conditions. In this regard, the project workers would welcome more moderate changes that are well-conceived and gradually introduced.

Nearly all interviewees confirmed frequent *interruptions during their work,* especially due to inquiries made by colleagues resulting of the high need for consultation and

coordination in the project groups. Remarkably, almost all interviews revealed the respondents' ambivalent attitude towards these work interruptions. On the one hand, with a view to the tight schedule, these interruptions are described as stressful since project team members are repeatedly torn from their work and have to rethink the matter afterwards ('You are again and again pulled out of your work. So it takes more time, of course.', design engineer 4). On the other hand, most interruptions are associated with a large benefit since they are an important and helpful source of information and collaboration. Thus, interviewees stated that they are promptly informed about important decisions or notified of errors and new technical solutions ('You are always up to date.', design engineer 3). This ultimately saves correction time. A similar perspective is described for *environmental stress* due to background noises in open-plan offices and collaboration of the project team in rather confined spaces.

Further stress factors mentioned by some interviewees included high levels of *concentration requirements* during the project work, in particular when doing planning work or making decisions, as well as *problems in work organization* in the form of incomplete documents, materials, and work tools.

Resources: 'You're Not Alone at Your Workplace, and You Don't Have to Work It Out on Your Own.'

All interviewees emphasized the importance of the wide *job decision latitude* they have in their work. This mainly refers to freedom in deciding on approaches or the sequence in which concrete tasks are completed. Project members are only given a predefined goal (completion of a subtask) and an overall framework like budget, deadlines, customer specifications, and details defined in the team. Within this framework, they can act freely:

> 'And I can also influence the way something is done. [...] They tell me the goal, and how this goal is reached is up to me.' (design engineer 2)

The influence on central framework conditions of the project work or the individual volume of work is, however, considered as rather limited. Milestones and deadlines are described as hardly having an influence. Participants explained that a strict schedule is set up for each project and has to be rigorously followed. Individual subtasks and intermediate deadlines are described as determined on the basis of this plan.

Good *opportunities for mutual social support* and *communication* during the project work are stressed as essential resources. Furthermore, the interviewees unanimously described the existence and benefit of a good *social climate* ('I'm very satisfied now with the climate amongst the colleagues. It is an open and calm climate.', design engineer 3). Close collaboration in the teams and proximity between the colleagues result in open communication ('There are hardly any secrets or things like that.', de-

sign engineer 1) and positive handling of criticism and mistakes, which is seen as a valuable resource:

> 'And also addressing problems or mistakes. That you say, yes, I've made a mistake, and we'll have to do it again. This can be openly talked about. You don't have to feel uncomfortable even if there are other people around the table. Because mistakes happen and nobody will rip off your head. [...] But it needs to be addressed because if you don't have the courage to do so, the mistake is passed on. This may result in an even higher financial load.' (design engineer 4)

Another important and positively emphasized resource is the explicit social support amongst colleagues. Interviewees described the general willingness to mutually share knowledge and provide support during busy periods or in case of concrete problems:

> 'Which goes along with constant support from colleagues. Well, you're not alone at your workplace, and you don't have to work it out on your own. You can always go to your colleagues who are familiar with different areas or in a leading position. There you can get impulses and assistance that may help you with your work in a short time.' (design engineer 3)

Participative leadership was also positively stressed. Direct superiors participate in the project team, which ensures a short distance and thus good accessibility of the executive. In addition, the open and cooperative management style was seen as helpful.

The project members attach great importance to a fair *reward* (remuneration, job security, opportunity for advancement, recognition) of their performance. This is described as less related to aspects of financial compensation but rather to the desire for the recognition and appreciation of good performances:

> 'It would be nice [...] if it was sometimes better rewarded. If you could feel a bit of appreciation. If there is any kind of appreciation at all, it is often very general. Well done. But it is not noted who did what.' (design engineer 2)

Since the project-based organization with its flat hierarchy offers only a few classical career steps, the interviewees would welcome different promotion regulations. They reported about colleagues ('People who were really needed, who didn't progress, though.', design engineer 1) who left the case company due to the lack of such regulations.

Discussion of Findings

Our findings show that the dimensions of the Demand-Stressors-Resource Model (Zapf, 1993; Frese & Zapf, 1994; Zapf & Semmer, 2004; Clasen, 2012) are generally appropriate to analyse specifics of co-configured project work. By means of our analysis, we are able to explain demands, stressors, and resources of this work type in more detail. However, our case study findings also show that demands, stressors, and resources of co-configured project work correlate as a complex bundle. Thus, some findings cannot be assigned unambiguously to the three dimensions of the Demand-Stressors-Resource Model. More specifically, interviewees appraise de-

mands, stressors, and resources of co-configured project work as highly ambivalent. Thus, statements indicate that some factors might be at the same time demand and stressor, stressor and resource, or resource and stressor. Amongst other findings, we discuss this by means of the *three different types of ambivalence.* Table 3 gives an overview of the findings and the characteristics of the types of ambivalence by collocating them against dimensions of co-configured project work (vertical axis) and the dimensions of the Demands-Stressors-Resources-Model (horizontal axis). The arrows show the ambivalent factors, which will be explained in the following.

Table 3: Findings and forms of ambivalences (Type A, B, C)

		Dimensions of the Demands-Stressors-Resources-Models and their specificity in the case company		
		Demands	**Stressors**	**Resources**
Characteristics of co-configured project work	**Network with multiple perspectives and poly-contextuality**	- cooperation (internal, external) - individual responsibility - dealing with contradictory demands - high complexity and variability - numerous institutional interfaces - internal cooperation requirements and cooperation density	- dependence on other cooperation partners - specification of framework conditions (time, budget) - high susceptibility - uncertainty - burden of past projects	- open communication - participative leadership
	Flexible adaptation of products and services	- work-related self-organization - missing routines - variability	- time pressure - unpredictable problems/ additional work - knowledge acquisition problems and learning obstructions synchronization problems	- job decision latitude (work task) - reward

Type B 2: work interruptions

Type C 1: opportunities for mutual social support

Type C 2: communication (open-plan office)

Type A: continuous further development

Type B 1: permanent internal changes

Type C 3: job decision latitude (work–private)

Demands and Ambivalence Type A (Demands Become Stressors)

With respect to the characteristics of co-configured project work (network, multiple perspectives and poly-contextuality, flexible adaption; see 2.1), employees need to

cooperate with different internal and external partners with often contradictory demands. Accordingly, those interviewed described the complexity and *variety* of the co-configured project tasks as central demands. This supports the assumption that these factors are particularly prevalent in project work (e. g. Mühlfelder, 2004). The complexity and *variety* of tasks as a feature of co-configured project work are especially intensified due to the direct involvement of customers, suppliers, and further project partners. This also increases the uncertainty of co-configured project work. Besides, the self-organization of the chronological sequence and content of tasks were identified as key demands. Thus, the results point in a similar direction as Gerlmaier and Kastner's study (2003) on the high requirements for self-organization in the case of IT project members.

The co-configured character of project work further increases the *necessity to permanently acquire knowledge and qualifications.* The interviewees regarded this as a positive demand, which, however, can also change into negative qualification and performance pressure. If demands become stressors, we refer to it as 'Ambivalence type A' (A, Table 3). Gerlmaier (2004) reports on similar results in IT project work. This is also consistent with Edwards' et al. (2000) Person-Environment Fit Theory, which argues that demands have their best health-related effects when the complexity of the demands meets the qualification of the worker and leads to under- or overload in case of too low or too high complexity. Project work, in general, is characterized by the particular tendency to permanently strive to question and improve performance. In this context, Schirmer (2014) points to the danger that performance optimization which grows to become a permanent individual obligation may, in the long run, be linked to a depletion the employees' performance capability. This may go along with negative health-related effects. However, the interviewees in our study did not mention previous negative health-related effects.

Stressors and Ambivalence Type B (Stressors Become Resources)

Time pressure and high uncertainty during work processes were identified as central stressors. This is also consistent with previous findings on project work in the IT sector (Gerlmaier & Latniak, 2007; 2013; Gerlmaier & Kastner, 2003) or on other workers in more flexible work arrangements (Vahle-Hinz, Kirschner, & Thompson, 2013). However, while a large majority of those asked in the IT sector reported on work under time pressure and the obligation to regularly work overtime (Gerlmaier & Latniak, 2013, Gerlmaier, 2004, Gerlmaier & Kastner, 2003), interviewees from the case company described stressors resulting from time pressure and overtime work as more cyclic. This can mainly be attributed to the different duration of projects in both sectors. Gerlmaier und Latniak (2007) point to the particularly high pressure before deadlines. Their sample companies usually had to deal with short project durations and multi-project work, which led to a fast recurrence of corresponding peak phases. In our case company, however, projects last at least one year and staff members mostly work on only one project. Time pressure in the case

study is intensified by the co-configured project work in the form of direct dependency on the customer, purchaser, and other project partners. In this context, time and deadline pressure can generally use up possible resources like social support by colleagues (similar findings in Gerlmaier & Latniak, 2007).

The interviewees considered *internal changes* (B 1 , Table 3) such as changing project management tools or engineering software and *interruption of work* (B 2 , Table 3), e. g. due to enquiries from colleagues or project partners, as particular stressors. Interruptions of work are perceived as disruptions of one's own workflow. At the same time, the project workers assess frequent internal changes and interruptions of work as positive because they offer the opportunity to receive the latest and often very relevant information, which reduces for example correction time. Thus, we classify these factors as 'Ambivalence Type B' (stressors become resources). These findings point in a similar direction as Gällstedt's (2003) and Gerlmaier's and Latniak's (2007; 2013) findings, whereas both internal changes and interruptions of work were evaluated as ambivalent by those asked.

Resources and Ambivalence Type C (Resources Become Stressors)

Our study identified the high job decision latitude in terms of the execution of the direct work task, social support, and open communication in the company as well as participative leadership as key resources for the work process. It needs to be emphasized that the unfolding of resources is partly rather constrained. Thus, job decision latitude is narrowly defined by central frameworks (e. g. strict time constraints) and the situational specifications of the requirements in the corresponding project (e. g. implementation of unpredictable changes). This is similar to the findings of Gerlmaier and Latniak (2007) for project work in the IT sector. Besides, the opportunity for social support from colleagues is to some extent used up by time and deadline pressure. Hence, our findings point to a third 'Ambivalence Type C' where resources become stressors. Hence, the resource *open communication* that is supported by the open-plan office (C 2, Table 3) is perceived as ambivalent because of the loud noise level. *Opportunities for mutual social support* (C 1, Table 3) become a stressor especially in times when project workers are under time pressure and need to instruct new employees or answer questions from other colleagues. The *high job decision latitude* (C 3, Table 3) is also considered as an important resource. However, this could become a stressor especially when the available time needs to be balanced with respect to work and private life. Especially our findings regarding the two categories *opportunities for mutual social support* and *high job decision latitude* are very remarkable since previous research rather confirms that these factors have positive impacts on health-related issues and are therefore not regarded as potential stressors (see recent meta-reviews by Rau & Buyken, 2015; Theorell et al., 2015).

Implications and Limitations

Our study indicates that the Demand-Stressor-Resource Model (Zapf, 1993; Frese & Zapf, 1994; Zapf & Semmer, 2004; Clasen, 2012) represents an appropriate analytical framework to empirically investigate co-configured project work. Nevertheless, our study implies that the approach might be enriched for future research in several ways. For example, as the model is rather task-based and does per se not include certain facets such as social aspects, we suggest that further studies of co-configured project work should expand the model accordingly. Furthermore, since there turned out to be *ambivalent attitudes* towards many factors, complete support of the threefold division into specifically-acting demands, stressors, and resources as intended by the model is not possible. In particular, we found three different types of ambivalences. Further research is needed to analyse *under which specific conditions and situational factors* demands become stressors, stressors become resources, and resources become stressors. Accordingly, our findings point to the necessity of a *multi-level approach* when analysing impacts of co-configured project work in order to consider both organizational facets of project work and organizational level interventions (e. g. organization of the collaboration of project partners, multi-project management in the company) as well as individual aspects (design of the job task, demands, stressors, resources of project members) (Faßauer & Geithner, 2016).

Our interviewees described demands, stressors, and resources of their co-configured project work. However, they did not relate to stressors in terms of specific health-related aspects. We can only speculate that they might have refused to openly admit overload and psychological stress in an interview situation. Therefore, we suggest that further studies should use a *multi-method approach* in order to assess positive and/or negative health-related issues. In the field of condition-related stress determination, subjective survey methods (self-observation) should be supplemented by so-called objective forms of analysis (third-party observations) (Rau & Buyken, 2015; Theorell et al., 2015). This can include different methods like the use of trained observers, interviews observed by externals or ratings by experts (Böckelmann & Seibt, 2011). The usage of large-scale stress surveys (via questionnaires) could provide further important information. However, due to big differences between different modern forms of activities, it seems inevitable to adapt existing instruments or develop new tools with direct reference to (co-configured) project work, as already done by Clasen (2012) with the ISTA-F for the stress-related task analysis among freelancers. Because of the ambivalent perception of demands, stressors, and resources in co-configured project work, such questionnaires should be based on approaches that differentiate between certain working conditions and their effect. In addition to the stressors and resources, we recommend including perceived strains and their consequences in further analyzes. Proven and validated methods for both the determinants of objective (organ systems and activation level) and subjective (components of psychological health) strains and their impacts (objective: absences,

sickness rates, work-related illnesses etc.; subjective: short-term conditions of fatigue, monotony, and stress as well as long-term psychological impairments) already exist (Böckelmann & Seibt, 2011). Moreover, a comparative case study analysis could investigate conditions that lead to different strains in companies with similar stress constellations.

When referring to the limitations of our study, one certainly has to point out the single case approach. This approach can only suggest some patterns and principles that need to be validated and expanded through more detailed empirical investigations such as corresponding intensive case studies in organizations from different sectors. Since we focused on co-configured project work, it would be interesting to compare this type of work with other modern types of work and/or other forms of projects. According to Theorell et al. (2015), research is especially needed for kinds of working conditions that are particularly developing in the modern working world.

Conclusion

Using a case study, the article analyses demands, stressors, and resources of employees in co-configured project work. This form of activity is becoming increasingly important in practice. Despite this strong rise in order to meet flexibility requirements, the impacts of this work form on employees have hardly been empirically analysed so far. This is also due to the fact that existing instruments and standardized methods of stress and health-related research need to be adapted since they concentrate on other forms of work and have to be critically reviewed in the case of co-configured project work. The case study findings show that the basic categories *demands, stressors,* and *resources* are suitable for the description of co-configured project work, even though the boundaries between them are ambivalent. Thus, it is worthwhile to intensify research since projects and particularly co-configured project work as a modern form of work will continue to increase in business practice, which will have an impact on the demands and potential stressors of employees. From a managerial point of view, our findings point to the necessity of organizational level intervention (management of the co-configuration) towards an appropriate design of the job task.

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