Managing the Crisis: How COVID-19 Demands Interact with Agile Project Management in Predicting Employee Exhaustion

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As a global pandemic, COVID-19 impacts work-related processes, placing strain upon many employees in project teams. Identifying process variables and potential organizational resources can play an important role in addressing employee mental health, both for the current pandemic and future crises. Based on an extension of the job demands–resources model, this paper introduces COVID-19 demands as distal job demands, examining their influence on emotional exhaustion through proximal unfinished tasks. Furthermore, we suggest that agile project management acts as a buffering job resource in this relationship. In two studies, we drew samples from Germany (N = 168) and the USA (N = 292). Across studies, COVID-19 demands had an indirect effect on emotional exhaustion, mediated by unfinished tasks. Furthermore, agile project management acts as a buffering job resource for individuals in Germany, attenuating the relationship between COVID-19 demands, unfinished tasks and subsequent feelings of emotional exhaustion. In contrast, findings from Study 2 revealed that COVID-19 demands were more strongly related to unfinished tasks and subsequent feelings of emotional exhaustion in the USA when individuals reported higher levels of agile project management. Taken together, our results indicate that project work under COVID-19 fosters feelings of emotional exhaustion through the accumulation of unfinished tasks.

Introduction

The COVID-19 pandemic is accelerating change on many levels, impacting organizations, societies and populations around the world at scale (Gates, 2020). While dealing with changes in the organizational environment is stressful for teams and individuals even in non-pandemic times (Sutherland and Cooper, 2006), the pandemic takes an extra toll on employees’ mental health (Hamouche, 2020). In fact, levels of emotional exhaustion – ‘feelings of being overextended and depleted of one’s emotional and physical resources’ (Maslach and Leiter, 2008, p. 498) – were on the rise during the first wave of the outbreak (Hwang, Hur and Shin, 2020). As work in general is trending towards a project-based organization with roughly one-third of all business activities in Western economies being project-based (Schoper, 2018), employees in project teams present a relevant population to study pandemic-related strain reactions. Project teams have been and still are inherently dependent on collaboration among team members, managers and customers. With many organizations implementing full-time teleworking to contain transmission of the virus (Chong, Huang and Chang, 2020), regular
face-to-face interactions have been minimized. Hence, redefining collaborative practices – in addition to other adjustments – appears vital for employees in project teams in order to keep up with regular project tasks during the pandemic.

Initial evidence points to the role of pandemic-related task setbacks in facilitating emotional exhaustion, especially for employees with high levels of task interdependence (Chong, Huang and Chang, 2020). While a growing body of research has studied effective interventions against emotional exhaustion in non-pandemic times (Maslach and Leiter, 2008), identifying specific drivers during the COVID-19 pandemic is instrumental for our understanding of the short- and long-term effects of the pandemic. Furthermore, this paper argues that research on emotional exhaustion has mostly been restricted to proximal antecedents such as workload, working time and job control (Aronsson, 2017). Following recent initiatives to expand the motivational process in the job demands–resources (JD-R) model by integrating distal antecedents such as organizational climate (Albrecht, 2015), this paper aims to extend the theory on the health impairment process of the JD-R model. More specifically, we propose that the distal job demands posed by the COVID-19 pandemic (hereafter ‘COVID-19 demands’) influence proximal job demands situated at the task level, which in turn are related to emotional exhaustion for employees in project teams. We argue that these broader, distal demands may affect emotional exhaustion through the process of accumulating proximal job demands. One such proximal demand could be the number of unfinished tasks that each project employee has.

The number of unfinished tasks may be a fruitful pathway for linking COVID-19 demands and feelings of emotional exhaustion for two reasons. First, from a theoretical perspective, unfinished tasks may help to explain the process by which distal factors – such as COVID-19 demands – influence the proximal working context for project employees. During a global pandemic, quantitative and qualitative changes in a macro-organizational environment may result in additional demands (i.e. COVID-19 demands). Project employees may in turn prioritize dealing with COVID-19 demands over their primary tasks. We argue that unfinished tasks better represent the missing link between distal demands and emotional exhaustion than other job design elements (e.g. generic job demands, role ambiguity). While being specific enough to capture short-term variations, unfinished tasks should be a global measure of the workload that a project employee aimed to complete but left unfinished when he or she stopped working (Syrek, 2017). Second, from a practical perspective, recognizing early warning signs regarding employee mental health is crucial for organizations during the COVID-19 pandemic and regular change processes in the future. Using information about task (non-)completion may provide occupational health professionals with non-intrusive opportunities to identify individuals who may feel exhausted.

Changes in the work environment are sources of stress for almost every employee affected (Sutherland and Cooper, 2006). Nevertheless, some employees might be better prepared to cope with change than others (Lawrence and Callan, 2011). A major management approach that aims to support organizational adjustment to change is agile project management (Bergmann and Karwowski, 2019). When employees work in organizations that apply agile project management methodologies, they experience high levels of autonomy, equality and iterative delivery (Koch and Schermuly, 2021). Without the need to adhere to long-term project plans, employees in agile project teams are accustomed to facilitating timely responses to changes in the organizational environment (Janssen and van der Voort, 2020). Thus, we believe that they are better equipped to quickly modify processes in light of COVID-19 demands because they autonomously and iteratively adapt to the necessary changes. In turn, this adaptive capacity gives them time to finish primary tasks. In line with our extension of the health impairment process, job resources may attenuate the impact of distal job demands on proximal job demands, since they may be helpful in addressing the distal demands (i.e. completing tasks despite COVID-19 demands). We believe that working with agile project management methodologies may function as such a resource. By investigating the role of agile project management as a job resource, this paper answers previous calls to incorporate job resources when building on the JD-R model during the COVID-19 pandemic (Rudolph, 2020).

Taken together, this paper aims to answer two research questions: (1) How did demands posed by the COVID-19 pandemic affect employees in project teams? (2) Does agile project management provide project employees with organizational

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resources? Therefore, we collected data from employees in project teams located in Germany (Study 1) and the USA (Study 2). We conducted a two-wave study in Germany, in which 168 project employees assessed their current level of COVID-19 demands, agile project management, unfinished tasks and emotional exhaustion (see Figure 1 for the theoretical research framework that guides our study). As the USA is one of the most affected countries in the world (World Health Organization, 2020), we furthermore collected and analysed the cross-sectional survey data of 292 project employees in the USA with regards to the same variables (Study 2) to replicate our findings from Study 1.

Literature review

The JD-R model

When examining factors that make (project) work stressful, while at the same time addressing resources that are helpful in highly stressful situations, the JD-R model (Demerouti, 2001) offers a fruitful avenue of investigation during the COVID-19 pandemic (Rudolph, 2020). As a broad framework, the JD-R classifies psychosocial work characteristics into either job demands or job resources. Job demands can be defined as physical, psychological, social or organizational aspects of the job that require sustained physical and psychological effort (Demerouti, 2001). Job resources, meanwhile, refer to physical, psychological, social or organizational aspects of the job that may be functional in achieving work goals or reducing job demands (Demerouti, 2001). According to the JD-R model, job demands and job resources spark two distinct processes. On the one hand, excessive job demands lead to sustained activation and exhaustion, which in turn affects mental health outcomes; this is known as the health impairment process. On the other hand, job resources stimulate a positive work-related state of mind (i.e. work engagement), which in turn fosters positive organizational outcomes; this is known as the motivational process (Schaufeli and Taris, 2014).

Health impairment process: the COVID-19 pandemic as distal job demands

Although there is growing evidence for the impact of societal and macro-organizational factors on emotional exhaustion, most studies focus on the immediate work context and proximal job demands such as workload or job control (Aronsson, 2017). Proximal job demands are those that are directly related to the tasks that are performed (Pak, 2019) – in a project setting often referred to as ‘project tasks’ (for a recent example, see Zhang, Yao and Yiu, 2020). Since these demands are closely related to the experiences of employees, the heightened scholarly interest is warranted. Nevertheless, a considerable literature has grown up around the theme of influencing factors in the JD-R model that take place further upstream than is commonly implied (see e.g. Hawkes, Biggs and Hegerty, 2017; Roodt, 2018).

Distal job demands can be defined as demands in the societal and organizational context in which the work takes place (Pak, 2019). We argue that differentiating between proximal job demands and distal job demands is an important extension of the JD-R model in two distinct ways. First, it allows future research to disentangle how environmental and macro-organizational factors influence the experience of (project) employees through proximal job demands. Second, identifying distal job demands appears beneficial in addressing factors with a larger downstream impact when preventing work-related stress: primary stress prevention (i.e. intervention targeted at the organizational level) is generally more effective than secondary stress prevention (i.e. intervention targeted at the individual level) because the former aims to remove the stressor altogether (Lamontagne, 2007).

COVID-19-related demands may function as an example of distal demands that impact employees’ mental health. We expect that project employees exert sustained psychological effort to deal with the pandemic’s demands. COVID-19-related demands may be attributed to additional
(quantitative and qualitative) challenges in the macro-organizational environment of the project employee.

To identify COVID-19 demands, we chose the Job Descriptive Index (JDI; Smith, Kendall and Hulin, 1969) as a foundation. Originally, the JDI was designed to measure different job facets related to job satisfaction. It consists of five facets, namely (1) cooperation with the manager, (2) collaboration with colleagues, (3) promotion, (4) pay and (5) general work content. Job facets in general can be defined as the individual components that constitute one’s experience at work (Rice, Gentile and McFarlin, 1991), and they account for the multidimensional complexity of the perception of the workplace. Using a bipolar approach, we argue that those facets cannot merely be sources of job satisfaction; they are also sources of job dissatisfaction. More specifically, they may act as non-task-related job aspects in which additional demands can develop. We used the JDI to identify COVID-19 demands in various aspects of the job. In the following, we discuss how the COVID-19 pandemic has turned those critical job facets into job demands.

(1) The job facet ‘cooperation with the manager’ may be affected in several ways. Due to prolonged quarantine periods during the pandemic (Brooks, 2020), project team members may develop perceptions of isolation when experiencing an absence of support from supervisors (Kunze, Hampel and Zimmermann, 2020). Additionally, given that telework has been shown to create distance between team members and their project managers (Sewell and Taskin, 2015), leader–member exchange (LMX) quality in project teams may suffer because of the current situation.

(2) Furthermore, ‘collaboration with colleagues’ is more difficult in most project teams. Since the primary mode of communication is electronic (e.g. conference calls, emails, video calls), project team collaboration during the pandemic may lack the emotional richness of regular face-to-face interactions (see Mulki, 2009). Furthermore, work in project teams is collaborative in nature. Telecommuters may miss the informal learning opportunities of spontaneous discussions, informal chats or meetings around the coffee machine (Cooper and Kurland, 2002).

(3) The COVID-19 pandemic may also affect ‘promotion’ opportunities: telecommuting employees in project teams may fear ‘being out of sight, out of mind’ regarding recognition and rewards (Kurland and Bailey, 1999). A recent COVID-19 study (Baert, 2020) supports previous findings showing that full-time telework fosters feelings of decreased chances of promotion.

(4) Additionally, project team members may even fear for their ‘pay’: some projects that require travel or specific infrastructures, such as laboratories, might be delayed or lose their funding. However, even when only the completion of projects by their deadlines is in question, employees in project teams may be concerned about their pay.

(5) Lastly, on a general level – and therefore affecting the job facet of ‘general work content’ – the COVID-19 pandemic may alter the work content for employees in project teams. For instance, Van Der Feltz-Cornelis (2020) have reported large changes in job content for university staff, which is most often organized into scientific projects.

Even though those five facets account for relevant job dimensions in conventional workplaces, additional facets may be of interest for employees working in project teams during the pandemic. As processual aspects are of particular importance, we also assume that longer-term (6) project processes and procedures and short-term (7) day-to-day workflow are facets for which demands can arise. (6) First, the COVID-19 pandemic may have altered ‘work processes and procedures’: offline visualizations to track project progress such as Kanban boards must be digitized. Furthermore, project team members may need to care for family members who are ill or may even contract the virus themselves, resulting in deviations from project plans or missed deadlines. (7) Second, project employees might experience additional demands in their ‘day-to-day workflow’: on a daily basis, the reduction of synchronous working hours in teams (Ripamonti, 2020) may pose additional demands on individuals when waiting for other team members to act or respond. Additionally, daily routines, such as daily office meetings, might have been altered by the spatial separation of colleagues (Baert, 2020).
Based on the above discussion, we argue that the COVID-19 pandemic poses macro-organizational challenges that place distal job demands on employees in project teams. To refer to these, we coin the term ‘COVID-19 demands’. We assume that the ubiquitous nature of COVID-19 demands leads to work disruptions in all seven job facets. The accumulation of these disruptions should result in more unfinished tasks, in turn leading to higher levels of emotional exhaustion.

**Proximal job demands: the role of unfinished tasks as a mediator between COVID-19 demands and emotional exhaustion**

We propose that unfinished tasks are a fruitful pathway for linking distal COVID-19 demands and emotional exhaustion. Unfinished tasks refer to tasks that an employee aimed to finish, but that were left undone when the employee stopped working (Syrek, 2017). Many studies conceptualize unfinished tasks as a proximal job demand (e.g. Reis and Prestele, 2020), since unfinished tasks may exhibit sufficient daily or weekly intra-individual variation for predicting employee strain and recovery (e.g. Syrek, 2017; Syrek and Antoni, 2014). Before the pandemic, employees in project teams were faced with their usual tasks (or primary tasks), resulting from implicit or explicit agreements with their supervisors, co-workers and organization. During the COVID-19 pandemic, additional demands might have been made on the individual. Those additional demands may be perceived in the seven job facets described above. According to the literature on organizational change, the process of change itself often requires extra effort, creating additional workload stress for the individual (Smollan, 2015). Under high levels of uncertainty, disruptions and qualitative changes to primary tasks may contribute to longer processing times. Moreover, individuals who perceive high COVID-19 demands may face not only their primary tasks but also more tasks, different tasks or unfamiliar ones. When multiple tasks need to be performed within a specific time frame, individuals make decisions about the sequence in which they will carry out their tasks (Claessens, 2010). According to the strategic task overload management model, individuals may switch from their ongoing task (or primary task) to an alternative task if the alternative task exhibits attributes such as high priority and high salience (Wickens, Gutzwiller and Santamaria, 2015). We argue that dealing with macro-organizational challenges, such as COVID-19 demands, entails tasks that are assigned high levels of priority, since they are necessary preconditions for regular interactions and procedures in projects. Furthermore, due to the omnipresence of the pandemic in various job dimensions, COVID-19-related tasks are salient for the individual. Consequently, primary tasks might only be processed secondarily. Therefore, we expect that the number of tasks that remain unfinished is higher for employees who experience higher levels of COVID-19 demands. In summary, this paper proposes that distal COVID-19 demands influence the proximal demands of unfinished tasks. We therefore arrive at the following hypothesis:

**H1a:** COVID-19 demands are positively related to unfinished tasks.

Based on two lines of argument, we argue that unfinished tasks can also contribute to elevated levels of emotional exhaustion for employees in project teams. First, since workload can be operationalized as the combined amount of completed tasks and unfinished tasks, and unfinished tasks remain active and accessible until completion (Förster, Liberman and Higgins, 2005), we expect this portion of the workload to be closely associated with emotional exhaustion. In line with the JD-R model, workload (i.e. proximal job demand) is a central predictor of emotional exhaustion (Aronsson, 2017).

Second, sufficient recovery depends on the absence of work-related stressors during non-work time, allowing the individual to ‘switch off’ when not at work (Kinnunen, 2011). Conversely, when job demands are present, individuals have a harder time disengaging from work during non-work time due to increased negative activation (e.g. physiological stress responses or negative affect; Sonnentag and Fritz, 2014). Larsen and Christenfeld (2011) have argued ‘that recovery relies on a sense of completion. That is, it is possible that recovery is delayed until we engage in behaviors that confirm the event has been dealt with’ (p. 147). Therefore, employees in project teams may have difficulties detaching if tasks remain incomplete. The missing process of recovery further elevates levels of emotional exhaustion. We therefore arrive at the following hypotheses:
**H1b**: Unfinished tasks are positively related to emotional exhaustion.

**H2**: The positive relationship between COVID-19 demands and emotional exhaustion is mediated by unfinished tasks.

**Job resources: the role of agile project management**

Agile project management refers to a set of project management frameworks that share principles identified by Fernandez and Fernandez (2009) and Dybå, Dingsøyr and Moe (2014). According to Koch and Schermuly (2021), those principles may be organized into three meta-principles. (1) Autonomy: the project team has sole discretion to make decisions and organize their work. (2) Equality: all team members work together on an equal footing. (3) Iterative delivery: without rigid objectives set out at the beginning of a project, partial objectives are regularly defined and evaluated at short project intervals (i.e. iterations) while customer feedback is integrated.

In line with our proposed extension of the health impairment process, job resources may be helpful in dealing with the demands (i.e. completing tasks despite COVID-19 demands), since they may mitigate the impact of distal job demands on proximal job demands. Three lines of arguments support this notion for agile project management, based on the definition proposed above.

**Autonomy.** The team work-design literature permits us to suggest that the project team’s autonomy serves as a job resource (Handke, 2020), mitigating the effects of COVID-19 demands on proximal unfinished tasks. Conceptually, team autonomy may comprise decision control (i.e. the degree of influence that team members have on central decisions) and process control (i.e. the degree of influence that team member recommendations have on the process; Handke, 2020). By taking into account task complexity and team velocity (i.e. the number of deliverables that can be handled by the team in a given iteration), the project team itself manages task allocation among team members, and thereby autonomously balances the individual’s workload (Lin, 2014). In agile teams with high collective autonomy to make decisions about task allocation (i.e. decision control), the relationship between COVID-19 demands and unfinished tasks should be weaker. At the same time, agile teams may be better equipped to quickly adapt processes and procedures (i.e. process control) in light of COVID-19 demands, because they are accustomed to reflect on their collective efforts and autonomously adapt to necessary changes.

**Equality.** Agile project management methodologies institutionalize social interactions in regular, structured meetings (one very popular approach is called ‘daily stand-ups’). In those meetings, all participants have equal speaking time. Team members share information about previous and current tasks, thereby allowing other members to become aware of what each and every one is doing (Stray, Moe and Sjoberg, 2020). Where traditional meetings devolve into status updates and reports to the leader, agile stand-up meetings can help all team members to identify and resolve COVID-19 demands while meeting at eye level. We propose that such opportunities help employees to deal with COVID-19 demands and therefore mitigate their impact on unfinished tasks.

**Iterative delivery.** In agile project management methodologies, projects are structured into a series of iterations, usually lasting from 1 to 4 weeks (Grapenthin, 2015). At the beginning of each iteration, project team members decide which functional requirement(s) of the final product (often called backlog item) should be implemented and subsequently define all tasks that need to be performed to design and test these selected functional requirement(s) (Grapenthin, 2015). At the end of each iteration, a working product is delivered to the customer (hence ‘iterative delivery’). This iterative approach to task completion seems especially helpful at a time when the COVID-19 pandemic places additional demands on teams. Planning behaviours and implementation intentions specify where, when and how a behavioural goal will be pursued (Gollwitzer, 1999). By breaking down COVID-19 demands and functional requirements into specific tasks, individuals may therefore create cognitive resolutions that can counteract directing attention towards incomplete goals (Smit and Barber, 2016). Although those goals have not all been accomplished, there is an accepted pathway for completing them in the future. Regarding agile project management methodologies, we argue that the planning behaviours imminent in iterative delivery work in the same way: those behaviours help team members to redirect attention away from COVID-19 demands, allowing for primary tasks to be completed.
Furthermore, the modification of primary tasks, processes and procedures in light of COVID-19 demands might be easier for individuals who successfully manage iterative approaches and regular change. Therefore, iterative elements of agile project management methodologies should weaken the relationship between COVID-19 demands and unfinished tasks.

Taken together, the agile project management meta-principles of autonomy, equality and iterative delivery should mitigate the influence of COVID-19 demands on unfinished tasks. Subsequently, fewer unfinished tasks should result in lower levels of emotional exhaustion. We arrive at the following hypothesis:

**H3**: Agile project management moderates the mediating effect of unfinished tasks on the relationship between COVID-19 demands and emotional exhaustion, such that the indirect effect of COVID-19 demands on emotional exhaustion through unfinished tasks is weaker for higher than for lower levels of agile project management.

**Methods**

**Participants and procedure – Study 1 (German sample)**

The sample for Study 1 consisted of a total of 234 employees who were employed in a project setting. All participants were recruited with network sampling (Demerouti and Rispens, 2014): the authors of this paper and student research assistants recruited participants based on their professional network, the use of social media and snowball sampling (Bakker, Du and Derks, 2019). Interested individuals were invited and could participate by responding to a link to an online survey via email. The survey was conducted in German. The minimum age for participation was 18 years and participants were required to be (a) employed in Germany at that time and (b) part of a project team.

The first measurement took place in the first half of April 2020 \( (t_1) \), 2 weeks after initial restrictions were put in place by the German government on 22nd March. Participants took part in the second measurement 14 days later \( (t_2) \). Of the 234 participants that completed the online questionnaire at \( t_1 \), 178 participants completed the follow-up questionnaire (drop-out: 23.9%). Five participants were excluded from further analysis due to implausible answers on items (e.g. more than 168 hours worked per week). Next, we used completion times to filter out meaningless data and removed five additional cases with a relative speed index above 2.0 from the analysis (for more information, see Leiner, 2019). After excluding these cases, 168 participants (58.9% men, mean age = 39.3, SD = 11.5) remained in the final sample. They worked in a range of different industries (the highest percentage being 22.0% in the IT/software industry) and had an average tenure of 8.3 years (SD = 10.0) with their current employer. Participants indicated that on average the current project in which they were mainly involved was 49.7% finished (SD = 26.3). The average hours worked the previous working week were 37.4 (SD = 12.3), with 31.1 hours (SD = 15.9) worked from home by the average participant (both measured at \( t_2 \)).

**Participants and procedure – Study 2 (US sample)**

To replicate our findings from Study 1 (see Zhang, Dawson and Kline, 2020 for the importance of replicating structural equation models), we conducted a second study with participants from the USA. We opted to use Prolific as a dedicated research subject pool for our study. To recruit participants, we launched an online questionnaire in the second half of April 2020. By that time, over 1,000,000 COVID-19 cases had been reported in the USA, leading to stay-at-home orders in the majority of the 50 states (Fowler, 2020). To qualify for the survey, participants had to meet the following criteria: be employed and live in the USA, be fluent in English, work on a project team, have completed at least 100 tasks on Prolific and have an approval rating of at least 98% for tasks in the past. After survey completion, participants received compensation amounting to £0.94 (= $1.15 approximately). The survey was conducted in English.

A total of 300 employees answered our survey. We excluded eight cases to ensure data quality (i.e. participants that did not spend the appropriate time to answer the survey; see Study 1 for more details on that procedure). After excluding these cases, the final sample size was 292 participants (53.4% men, mean age = 34.0, SD = 17.8). They worked in a range of different industries (the highest percentage being 18.4% in education) and had an average tenure of 5.4 years (SD = 4.6) with
their current employer. Participants indicated that on average the current project in which they were mainly involved was 60.7% finished (SD = 21.9). The average hours worked the previous working week were 35.9 (SD = 13.5), with 29.3 hours (SD = 17.7) worked from home by the average participant.

Measures

All measures were administered in German for Study 1 and in English for Study 2. For all scales for which we did not find a respective version in English (i.e. COVID-19 demands, agile project management) or in German (i.e. unfinished tasks), the items were translated into the other language and then back-translated by another scholar to ensure the adequacy of the translation.

COVID-19 demands. Since there is no existing measure to assess COVID-19 demands, we developed a new scale. To measure how the COVID-19 pandemic affected employees in project teams, we aimed to construct a broad scale that addressed various job facets where COVID-19 demands may develop. Applying a facet approach while interpreting only the composite factor (i.e. COVID-19 demands) allows us to capture the multidimensional complexity of the project-team workplace in a single measure. In addition to the five general JDI facets of ‘supervision’, ‘co-workers’, ‘promotions’, ‘pay’ and ‘general work content’ (Smith, Kendall and Hulin, 1969), we appended ‘project processes and procedures’ and ‘day-to-day workflow’ as facets of central importance in the project environment. We developed one item for each of the seven job facets. A sample item was ‘I’m experiencing additional demands regarding processes and procedures in my project’ (see Appendix 1 for all seven items). All participants were instructed to indicate on a seven-point scale from 1 (not at all) to 7 (entirely), whether they experienced additional demands due to the COVID-19 pandemic in the aforementioned areas. Cronbach’s alpha of the seven-item scale was 0.77 in Study 1 (COVID-19 demands were measured at t₁) and 0.83 in Study 2.

Unfinished tasks. Unfinished tasks were measured using the six-item scale developed by Syrek (2017, for Study 1 in a German translation). Since unfinished tasks tend to vary between weeks (Syrek, 2017), we instructed all participants to consider the tasks for their current working week. Agreement was indicated on a five-point scale from 1 (strongly disagree) to 5 (strongly agree) for items like ‘I need to carry many of this week’s due tasks into the next week’. Cronbach’s alpha was 0.91 in Study 1 (unfinished tasks were measured at t₁) and 0.91 in Study 2.

Emotional exhaustion. Emotional exhaustion was measured using three items of the emotional exhaustion subscale of the Maslach Burnout Inventory (Maslach and Jackson, 1981): ‘I felt emotionally drained from my work’, ‘I felt burnt out from my work’ and ‘I felt I was working too hard at my job’. For the German sample (Study 1), we used validated translations of a German adaptation (Barth, 1985). Participants were instructed to refer to the previous 4 weeks. Five-level frequency responses ranging from 1 (never) to 5 (very often) were employed. Cronbach’s alpha was 0.80 in Study 1 (emotional exhaustion was measured at t₂) and 0.89 in Study 2.

Agile project management. Agile project management was measured using the scale developed by Koch and Schermuly (2021), with 12 item pairs, based on the agile manifesto (Beck et al., 2001) and capturing individual perceptions of the team-level construct. For each of the 12 pairs of contrasting statements (comparable to a semantic differential), participants selected one of the seven spaces separating each pair that most closely reflected their individual views about the project in which they were mainly involved. In contrast to an objective assessment of how the project team is supposed to work, this allowed us to capture the subjective perceptions of project team employees as precursors of their individual reactions. A sample pair of contrasting statements is ‘Important decisions are made by the project lead’ (reflecting traditional project management values and principles) versus ‘Important decisions are made by the project team’ (reflecting agile project management values and principles). Refer to Appendix 2 for the full list of items. Cronbach’s alpha of the 12-item scale was 0.77 in Study 1 (agile project management was measured at t₁) and 0.74 in Study 2. Those values correspond to the original study (α = 0.75; Koch and Schermuly, 2021), which also tested the factorial structure through confirmatory factor analysis (CFA): the authors found sufficient support for a three-factorial structure (plus a second-order factor) over an independent
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Table 1. Means, standard deviations and correlations for Study 1

| Variable                          | M   | SD  | 1    | 2    | 3    | 4    | 5    |
|----------------------------------|-----|-----|------|------|------|------|------|
| 1. COVID-19 demands (t\textsubscript{1}) | 3.71| 1.14| 0.77 |      |      |      |      |
| 2. Unfinished tasks (t\textsubscript{2}) | 1.99| 0.90| 0.25***| 0.91 |      |      |      |
| 3. Emotional exhaustion (t\textsubscript{2}) | 2.41| 0.82| 0.13 | 0.24***| 0.80 |      |      |
| 4. Agile project management (t\textsubscript{1}) | 4.62| 0.92| −0.07 | −0.14 | −0.10 | 0.77 |      |
| 5. Project progress (t\textsubscript{1}) | 49.69| 26.31| −0.06 | −0.26***| −0.04 | 0.08 |      |

Note: M and SD are used to represent mean and standard deviation, respectively. The diagonal exhibits values of Cronbach’s alpha for all study variables.

*p < 0.05, **p < 0.01, ***p < 0.001.

three-factorial structure (see Koch and Schermuly, 2021 for a more detailed account of the analyses). We used data from both of our present studies to replicate those analyses. The results of the CFA to test the three-factorial structure (plus a second-order factor) of the measure indicated the following estimates of model fit: $\chi^2(51) = 87.535$, $p < 0.001$, CFI = 0.961, TLI = 0.950, RMSEA = 0.039, 90% CI = [0.026, 0.052], SRMR = 0.038. These estimates are good, according to Schermelleh-Engel, Moosbrugger and Müller (2003), and support the idea that agile project management is a set of project management frameworks with common values that cohere to form a unitary construct.

Control variables. To control for potential effects outside the postulated relationships, several variables might appear to be suitable candidates. Capitalizing on previous findings about mental strain in agile projects, we decided to control for project progress in all our analyses. In so doing, we mitigate the potential effects of workload during different phases of the project’s lifecycle. As Tuomivaara, Lindholm and Käänsälä (2017) found, the individual’s perception of stress systematically varies across project periods. Furthermore, those perceptions might even be fundamentally different for agile versus traditional project teams (Tuomivaara, Lindholm and Käänsälä, 2017). To rule out the possibility that project progress interferes with our findings, we entered responses from a single item (‘Please indicate the percentage of work already completed in relation to the total project. [Example: If you are currently halfway through the project, set the slider to 50%.]’) as a control variable into all our models.

Results

Study 1 (German sample)

Table 1 presents descriptive statistics, the correlation matrix and Cronbach’s alpha for the study variables (Study 1). All our analyses were performed using the lavaan package (Rosseel, 2012) of R statistical software (R Core Team, 2021). By estimating the sampling distribution of the direct effects (H1a, H1b), the indirect effect (H2) and the conditional indirect effect (H3) nonparametrically via bootstrapping (3,000 resamples), no assumptions need to be made about the shape of the sampling distribution (Preacher, Rucker and Hayes, 2007).

Model and hypothesis testing. First, we specified a structural equation model (SEM) according to H1a, H1b and H2 (see Figure 2) that included all direct effects in addition to an indirect effect of COVID-19 demands (t\textsubscript{1}) on emotional exhaustion (t\textsubscript{2}) via unfinished tasks (t\textsubscript{2}). The latent variables for COVID-19 demands, unfinished tasks and emotional exhaustion were all measured by their respective items as measurement indicators. Second, we examined whether agile project management moderated the indirect effect of COVID-19 demands on emotional exhaustion via unfinished tasks (H3). To do so, we calculated Hayes’ index of moderated mediation (Hayes, 2015), which tests for a nonzero weight of the moderator in the indirect effect process. For this purpose, we used the recommended bootstrapping technique with 3,000 resamples. Since unfinished tasks and emotional exhaustion may vary according to the project stage, project progress was controlled for by specifying the respective relationships with unfinished tasks and emotional exhaustion in all our analyses.
Figure 2. Structural equation model of the indirect effect of COVID-19 demands via unfinished tasks on emotional exhaustion (Study 1)

Note: Path coefficients are standardized. Residuals and control variable are omitted for clarity of presentation.

\*p ≤ 0.05, \**p ≤ 0.01, \***p ≤ 0.001.

The estimates of model fit of the SEM to test H1a, H1b and H2, $\chi^2 (114) = 162.334, p < 0.01$, CFI = 0.955, TLI = 0.947, RMSEA = 0.050, 90% CI = [0.031, 0.067], SRMR = 0.055, are good, according to Schermelleh-Engel, Moosbrugger and Müller (2003). In line with H1a, COVID-19 demands ($t_1$) were related to unfinished tasks ($t_2$), $\beta = 0.311, 95\% CI = [0.111, 0.627]$. Furthermore, unfinished tasks ($t_2$) were associated with emotional exhaustion ($t_2$), $\beta = 0.247, 95\% CI = [0.101, 0.403]$, supporting H1b. COVID-19 demands exerted an indirect effect on emotional exhaustion at $t_2$ through unfinished tasks at $t_2$, $\beta = 0.077, 95\% CI = [0.026, 0.192]$, supporting H2 (see Figure 2 for a SEM with standardized coefficients).

We proceeded testing conditional indirect effects and found a significant index of moderated mediation: index = $-0.032, CI = [-0.075, -0.006]$, supporting H3. As an example of a project setting adhering to rather traditional project management values and principles, we also looked at the effect 1 SD above the mean of agile project management. Here, the indirect effect did not reach significance (conditional indirect effect $= 0.015, CI = [-0.014, 0.059]$). See Figure 3 for an illustration of the indirect effect at two different levels of agile project management for Study 1.

**Study 2 (US sample)**

Table 2 presents descriptive statistics, the correlation matrix and Cronbach's alpha for the study variables (Study 2). All analyses were performed in a manner analogous to Study 1.

**Model and hypothesis testing** The estimates of model fit of the SEM to test H1a, H1b and H2, $\chi^2 (114) = 254.365, p < 0.001$, CFI = 0.946, TLI = 0.936, RMSEA = 0.065, 90% CI = [0.054, 0.074], SRMR = 0.047 ranged between good and acceptable, according to Schermelleh-Engel, Moosbrugger and Müller (2003). In line with the results of Study 1, COVID-19 demands were related to unfinished tasks, $\beta = 0.194, 95\% CI = [0.089, 0.300]$ and unfinished tasks were associated with emotional exhaustion, $\beta = 0.264, 95\% CI = [0.127, 0.404]$. Supporting H2, COVID-19 demands again...
exerted an indirect effect on emotional exhaustion through unfinished tasks, $\beta = 0.051$, 95% CI = [0.022, 0.096] (see Figure 4 for a SEM with standardized coefficients).

We proceeded testing a conditional indirect effect and found a significant index of moderated mediation. In contrast to Study 1, this index was positive, indicating that the positive indirect effect of COVID-19 demands via unfinished tasks on emotional exhaustion increased with increasing levels of agile project management (index of moderated mediation $= 0.017$, CI $= [0.000, 0.046]$). As an example of a project setting adhering to rather traditional project management values and principles, we looked at the effect 1 SD below the mean of agile project management. Here, the indirect effect was positive and significant (conditional indirect effect $= 0.031$, CI $= [0.003, 0.069]$). As an example of a project setting adhering to rather agile project management values and principles, we also looked at the effect 1 SD above the mean of agile project management. Here, the indirect effect was also positive and significant (conditional indirect effect $= 0.063$, CI $= [0.028, 0.113]$). Therefore, we did not find support for H3 in the US sample. Contrary to Study 1, for employees reporting higher levels of agile project management, the effect of COVID-19 on unfinished tasks (and subsequently emotional exhaustion) was stronger. See Figure 5 for an illustration of the indirect effect at two different levels of agile project management for Study 2.

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Figure 4. Structural equation model of the indirect effect of COVID-19 demands via unfinished tasks on emotional exhaustion (Study 2)

Note: Path coefficients are standardized. Residuals and control variable are omitted for clarity of presentation.

*p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001.

Robustness tests

Since the results of Study 1 and Study 2 indicate differential moderation effects, we ran additional exploratory analyses to test for (a) potential confounding variables, (b) non-equivalence of measures and (c) differences between the two samples. Our analyses revealed that the inclusion of age, gender, working hours and occupation as additional control variables does not alter our findings. First, when entering those variables as control variables into the SEM, the indirect effect of COVID-19 on emotional exhaustion through unfinished tasks remains significant for both studies (Study 1: $\beta = 0.073$, 95% CI = [0.014, 0.181]; Study 2: $\beta = 0.057$, 95% CI = [0.027, 0.106]). Second, when controlling for the additional variables, the index of moderated mediation remains significant for Study 1 (index of moderated mediation for the model with additional control variables: index = −0.028, CI = [−0.075, −0.004]) and Study 2 (index of moderated mediation for the model with additional control variables: index = 0.019, CI = [0.001, 0.049]). The comparable pattern of results increases our confidence in the generalizability of our findings.

Furthermore, we tested for the psychometric equivalence of all constructs across countries through measurement invariance tests using multi-group CFA (Putnick and Bornstein, 2016). To determine the level of measurement invariance, we used the cutoff values recommended by Chen (2007). According to these rules of thumb, the CFI, RMSEA and SRMR indicate metric invariance of the measurement models across Germany and the USA for the scales of COVID-19 demands, unfinished tasks and emotional exhaustion (see Table 3 for fit indices for all constructs). This implies that for those scales, each item contributes to the respective latent construct to a similar degree across nations (Putnick and Bornstein, 2016). Our tests further support configural invariance for the agile project management scale. Since at least configural invariance can be established for all scales, it is unlikely that psychometric non-equivalence of the measures produced the differential moderation effects between the two samples.

Lastly, we were interested in differences between the two samples that may help explain the differential moderation effects of agile project management. With regards to our study variables, participants from the US sample reported higher levels
of COVID-19 demands ($t = -4.06, p < 0.001$) and emotional exhaustion ($t = -6.31, p < 0.001$), but lower levels of agile project management ($t = 5.25, p < 0.001$). No significant differences were found for unfinished tasks ($t = -1.31, p = 0.19$). Taken together, the results of the additional analyses imply that (a) confounding variables and (b) psychometric non-equivalence of the measures are unlikely to have produced the differential moderation effect between the two samples. Contrastingly, (c) elevated levels of strain (i.e. COVID-19 demands and emotional exhaustion) in the US sample may have acted as a contributory factor.

### Discussion

Proposing a possible extension of the health impairment process of the JD-R model, the overall aim of this paper was twofold. First, we introduced COVID-19 demands as distal job demands for employees in project teams, examining their influence on emotional exhaustion via proximal unfinished tasks. Second, agile project management was proposed to function as a buffering job resource that may help to reduce the negative effect of stressful situations at work during the COVID-19 pandemic. Our results – based on a two-wave study in Germany and a cross-sectional study in the USA – reveal that COVID-19 demands exert an indirect effect on emotional exhaustion through the accumulation of unfinished tasks (supporting H1a, H1b and H2). Furthermore, in the German sample, agile project management acts as a buffering job resource, attenuating the relationship between COVID-19 demands and unfinished tasks. In line with H3, lower levels of unfinished tasks subsequently reduced feelings of emotional exhaustion. Contrary to expectations, results of the US sample indicate that agile project management may also function in the opposite way. In Study 2, COVID-19 demands were more strongly related to unfinished tasks and subsequent feelings of emotional exhaustion when employees reported higher levels of agile project management.

### Theoretical implications

The present study adds to the literature on the psychological consequences of the COVID-19 pandemic in two distinct ways. First, COVID-19 demands can be conceptualized as distal job demands that impact the immediate working context through proximal demands. In line with the proposed extension of the motivational process of the JD-R model (Albrecht, 2015; Idris, 2012), the
Table 3. Tests of measurement invariance for all study variables

| Model                        | $\chi^2$ (df) | CFI   | RMSEA (90% CI) | SRMR | $\Delta\chi^2$ (df) | $\Delta$CFI | $\Delta$RMSEA | $\Delta$SRMR | Decision |
|------------------------------|---------------|-------|----------------|------|----------------------|--------------|----------------|---------------|----------|
| **COVID-19 demands**         |               |       |                |      |                      |              |                |               |          |
| Configural invariance        | 55.25 (28)    | 0.962 | 0.065 (0.043–0.086) | 0.043 | –                    | –            | –              | –             | –        |
| Metric invariance            | 66.42 (34)    | 0.955 | 0.064 (0.044–0.084) | 0.056 | 11.17 (6)            | 0.007        | –0.001         | 0.013         | Accept   |
| Scalar invariance            | 162.29 (40)   | 0.832 | 0.115 (0.099–0.131) | 0.098 | 95.87*** (6)         | 0.123        | 0.051           | 0.042         | Reject   |
| Residual invariance          | 221.32 (47)   | 0.760 | 0.127 (0.112–0.142) | 0.111 | 59.03*** (7)         | 0.072        | 0.012           | 0.013         | Reject   |
| **Unfinished tasks**         |               |       |                |      |                      |              |                |               |          |
| Configural invariance        | 89.76 (18)    | 0.936 | 0.132 (0.109–0.155) | 0.038 | –                    | –            | –              | –             | –        |
| Metric invariance            | 103.51 (23)   | 0.929 | 0.123 (0.103–0.144) | 0.060 | 13.75* (5)           | 0.007        | –0.009          | 0.022         | Accept   |
| Scalar invariance            | 134.09 (28)   | 0.906 | 0.128 (0.109–0.148) | 0.069 | 30.58*** (5)         | 0.023        | 0.005           | 0.009         | Reject   |
| Residual invariance          | 149.65 (34)   | 0.897 | 0.121 (0.105–0.139) | 0.076 | 15.56** (6)          | 0.009        | –0.007          | 0.007         | Reject   |
| **Emotional exhaustion**     |               |       |                |      |                      |              |                |               |          |
| Configural invariance        | 18.46 (2)     | 0.969 | 0.189 (0.122–0.265) | 0.033 | –                    | –            | –              | –             | –        |
| Metric invariance            | 24.87 (4)     | 0.960 | 0.150 (0.100–0.206) | 0.062 | 6.41 (2)             | 0.009        | –0.039          | 0.029         | Accept   |
| Scalar invariance            | 29.92 (6)     | 0.954 | 0.132 (0.089–0.178) | 0.066 | 5.05 (2)             | 0.006        | –0.018          | 0.004         | Accept   |
| Residual invariance          | 32.18 (8)     | 0.954 | 0.115 (0.076–0.155) | 0.068 | 2.62 (2)             | 0.000        | –0.017          | 0.002         | Accept   |
| **Agile project management** |               |       |                |      |                      |              |                |               |          |
| Configural invariance        | 153.95 (102)  | 0.944 | 0.047 (0.032–0.061) | 0.048 | –                    | –            | –              | –             | –        |
| Metric invariance            | 187.99 (113)  | 0.919 | 0.054 (0.041–0.066) | 0.064 | 34.04*** (11)        | 0.025        | 0.007           | 0.016         | Reject   |
| Scalar invariance            | 240.26 (121)  | 0.871 | 0.065 (0.054–0.077) | 0.072 | 52.27*** (8)         | 0.048        | 0.011           | 0.008         | Reject   |
| Residual invariance          | 264.76 (125)  | 0.857 | 0.066 (0.055–0.076) | 0.075 | 24.50* (4)           | 0.014        | 0.001           | 0.003         | Reject   |

Note: $N = 460$; Group 1 (GER) $n = 168$; Group 2 (USA) $n = 292$; Chen (2007) has recommended a general rule of thumb for deciding which measurement invariance models to 'accept' and to 'reject' based on nested model comparisons. The 'accept' decisions correspond to the strictest form of measurement invariance constraints that can be imposed on the data.

*p < 0.05, **p < 0.01, ***p < 0.001.

results of Study 1 and Study 2 suggest that the health impairment process can be expanded in the same fashion. Previous conceptualizations have focused on distal job resources such as the psychosocial safety climate (Idris, 2012), transformational leadership (Hawkes, Biggs and Hegerty, 2017) and human resource policies and practices (Albrecht, 2015). To our knowledge, this paper is the first to study distal job demands as an extension of the health impairment process. Differentiating between distal and proximal job demands will allow future researchers to study other distal demands, such as the quality of the work environment or work schedules, and their impact on the perception of task-level demands. More specifically for the ongoing pandemic, COVID-19 demands may provide a fruitful framework of investigation: they are unique since they occurred suddenly and unexpectedly. Furthermore, as the state of knowledge and regulations is constantly changing, those sudden demands are accompanied by high levels of uncertainty for all stakeholders. Lastly, COVID-19 demands affect societies as a whole, not only select project teams or organizations. Taken together, COVID-19 demands as a distal factor may feel more acute, inevitable and severe than previous conceptualizations of macro-organizational change. As a result, the concept of COVID-19 demands may provide timely insights into employee strain resulting from distal job demands and organizational change in project teams.

Second, our findings imply that agile project management can serve as a job resource buffering the impact of COVID-19 demands on unfinished tasks. However, this does not hold true in all populations. The reason for the contrasting results of Study 1 and Study 2 could be attributed to different degrees of strain in the two samples. Project employees in the US sample (Study 2) report higher levels of COVID-19 demands and emotional exhaustion compared to project employees in the German sample. Those differences in severity of the strain may in part explain why only participants from Germany experience agile project management as a job resource. When faced with potentially losing one’s job, one’s health insurance or one’s life, with a limited social welfare system to fallback on (Rector, 2015), the COVID-19 pandemic might spark existential fears for some individuals in the USA. Under these extreme circumstances, autonomy, equality and iterative delivery might be perceived as additional job limitations.
demands as opposed to buffering job resources. This would be in line with a recent redefinition of job resources in the JD-R model (Schaufeli and Taris, 2014), which depend on inter-individual differences in appraisal processes. In a project team faced with high levels of COVID-19 demands, making work decisions independently of supervisors, having extensive coordination phases with co-workers and meeting the short iteration deadlines may require drawing on resources that are occupied with existential thoughts and fears. As a result, the job resource of agile project management may be negatively valued during times of crisis, functioning as a threat to individuals under high levels of strain. Previous research indicates that team autonomy in particular is differently associated with behavioural outcomes, depending on the situation. In a highly turbulent environment, Chen (2015) found an inverted U-shaped relationship. In contrast, team autonomy and team performance were related in a U-shaped manner in a stable environment (Chen, 2015). Our data may therefore further support the idea of a too-much-of-a-good-thing effect of team autonomy during times of environmental turbulence.

Practical implications

Based on our findings, professionals may design workplace interventions that reduce COVID-19 demands so that employees in project teams have the time needed to complete primary tasks. More specifically, decision-makers should keep in mind that implementing agile project methodologies may not always provide employees with a demand-buffering resource. Since agile project management functions as a dimensional moderator of the relationship between COVID-19 demands and unfinished tasks, it seems expedient to use only selected agile practices (e.g. daily stand-up meetings, retrospectives) or to enrich one's project environment with other strain-buffering interventions (see Hamouche, 2020 for detailed recommendations). Furthermore, as the accumulation of unfinished tasks is a mediator of the relationship at hand, practitioners may use objective and subjective measures of unfinished tasks for detecting early warning signs regarding employee mental health in project teams.

Moreover, organizational decision-makers usually implement agile project management methodologies to prepare for future changes in the macro-organizational environment. While agile project management can deal with mild to moderate changes, significant change may require flexible adaptation of the project management strategy. Previous research has indicated that behaviours associated with leadership (i.e. communicating high-performance expectations, showing determination, articulating mission and vision) are especially important during times of uncertainty and threats (Waldman, 2001). Hence, establishing leadership elements, even in agile projects, may be a fruitful reaction to pandemics and other sources of organizational turmoil. Using the experience of all team members, project management methodologies should be tailored to the team and its situation.

Limitations and conclusion

The scope of our studies was limited in several ways. First, all measures were self-reported and common method variance may inflate our estimation of effect sizes. To minimize this effect, we applied a two-wave design for Study 1. Nonetheless, future research should address this issue by using fully longitudinal designs and multisource data (e.g. objective indicators for unfinished tasks, supervisor-rated levels of agile project management) when investigating these relationships. Furthermore, future research may adopt a multilevel approach to agile project management and test shared perceptions within project teams to account for the multidimensional nature of individuals embedded in projects.

Second, our findings concerning the moderating role of agile project management are ambiguous. One might argue that different sample characteristics and study designs may have contributed to discrepancies in the directionality of the moderating effect: while Study 1 used snowball sampling and a two-wave design, Study 2 employed a cross-sectional design based on a sample recruited via Prolific. Results from the measurement equivalence tests suggest that both samples responded to all measures in a comparable fashion. Nevertheless, future research should adopt multiple samples from different countries should aim for comparable recruitment strategies. Furthermore, existing contingencies, such as perceiving agile project management as a positively valued versus a negatively valued job resource, may have added to the lack of consistent results between the two studies. Future research should therefore consider
studying boundary conditions that explain differences in inter-individual appraisal processes.

Third, it is also conceivable that high levels of emotional exhaustion may in turn influence the number of unfinished tasks. In line with the idea of loss spirals (Hobfoll, 1989), exhausted individuals may exhibit lower levels of task performance since they are unable and unwilling to expand their effort (Schaufeli and Taris, 2005). Future research may therefore study the reciprocal relationship of unfinished tasks and emotional exhaustion by employing multi-wave studies with more than two points of measurement.

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Appendix

Instruction and full list of items to measure COVID-19 demands

First, we are interested in how the coronavirus pandemic (COVID-19) affects your professional situation. Compared to your normal job situation, where do you experience additional demands due to the coronavirus pandemic (COVID-19)?

I am experiencing additional demands regarding…

… work activities / work contents (CD1)
… collaboration with colleagues (CD2)
… opportunities for professional development (CD3)
… my own income (CD4)
… cooperation with the manager (CD5)
… daily work processes in my team (CD6)
… processes and procedures in my project (CD7)

Appendix

Table B1. Full list of item pairs to measure agile project management (Koch and Schermuly, 2021)

| Item | Traditional values and principles | Agile values and principles |
|------|----------------------------------|-----------------------------|
| Item 1 | Important decisions are made by the project lead. | Important decisions are made by the project team. |
| Item 2 | The project team is organized hierarchically. | All members of the project team meet at eye level. |
| Item 3 | The distribution of tasks is carried out by the project lead. | The distribution of tasks is carried out by the project team. |
| Item 4 | The project lead decides when a task is completed. | The project team decides when a task is completed. |
| Item 5 | The customer receives the project results at the end of the project. | The customer receives project results continuously over the entire project period. |
| Item 6 | Project results are developed without interim customer feedback. | Customer feedback is used again and again for the next project steps. |
| Item 7 | The project team has no direct contact with the customer. | The customer is an integral part of the project team. |
| Item 8 | The customer merely places the order. | The customer is actively involved in shaping the project. |
| Item 9 | The project team rarely reflects on its own work. | The project team reflects its own work at regular intervals. |
| Item 10 | Project phases are designed for the long term. | The project is divided into short project phases. |
| Item 11 | At the beginning of the project, long planning phases are at the centre of the work. | At the beginning of the project, the planning phase is kept as short as possible. |
| Item 12 | In our project team we strictly follow our project plans. | In our project team we adapt to changes. |

Note: For each of the 12 pairs of contrasting statements (comparable to a semantic differential), participants selected one of seven spaces separating each pair that most closely reflected their views about the project in which they were mainly involved.
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