



## OPEN ACCESS

EDITED BY  
Jessica M. Nicklin,  
University of Hartford, United States

REVIEWED BY  
Delia Virga,  
West University of Timișoara, Romania  
Or Shkoler,  
Université de Montréal, Canada

\*CORRESPONDENCE  
Elisa Lopper  
✉ elisa.lopper@hu-berlin.de

RECEIVED 04 April 2023  
ACCEPTED 07 July 2023  
PUBLISHED 20 July 2023

CITATION  
Lopper E, Milius M, Reis D, Nitz S and Hoppe A  
(2023) Weekly reciprocal relationships between  
job crafting, work engagement, and  
performance—a within-person approach.  
*Front. Organ. Psychol.* 1:1200117.  
doi: 10.3389/forgp.2023.1200117

COPYRIGHT  
© 2023 Lopper, Milius, Reis, Nitz and Hoppe.  
This is an open-access article distributed under  
the terms of the [Creative Commons Attribution  
License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or  
reproduction in other forums is permitted,  
provided the original author(s) and the  
copyright owner(s) are credited and that the  
original publication in this journal is cited, in  
accordance with accepted academic practice.  
No use, distribution or reproduction is  
permitted which does not comply with these  
terms.

# Weekly reciprocal relationships between job crafting, work engagement, and performance—a within-person approach

Elisa Lopper<sup>1\*</sup>, Marvin Milius<sup>2</sup>, Dorota Reis<sup>3</sup>, Sandra Nitz<sup>4</sup> and Annetkatrin Hoppe<sup>1</sup>

<sup>1</sup>Department of Psychology, Humboldt-Universität zu Berlin, Berlin, Germany, <sup>2</sup>Klinikum Landau-Südliche Weinstraße, Landau, Germany, <sup>3</sup>Department of Psychology, Saarland University, Saarbrücken, Saarland, Germany, <sup>4</sup>Department of Natural and Environmental Science, University Kaiserslautern-Landau, Landau, Germany

**Introduction:** Following the principles of the conservation of resources theory, this study explored whether job crafting, work engagement, and performance are reciprocally related from one week to the next.

**Method:** Data ( $N = 175$ ) from a weekly diary study were analyzed using a random intercept cross-lagged panel model (RI-CLPM) to differentiate between stable trait-like between-unit and state-like within-person components.

**Results:** The results revealed that, within weeks, job crafting, work engagement, and performance are associated with each other. Across weeks, on average, job crafting levels predicted work engagement and performance at the within-person level the following week. Inversely, work engagement, on average, predicted job crafting the next week, providing evidence for a positive cycle between both variables. Finally, work engagement and performance were reciprocally related from one week to the next, although the effects varied significantly in magnitude and direction.

**Discussion:** Overall, the within-person relationships between job crafting, work engagement, and performance were more heterogeneous than anticipated.

## KEYWORDS

job crafting, gain cycles, reciprocal relationships, within-person level, conservation of resources theory

## Introduction

Job crafting, as a form of proactive behavior at work, describes self-initiated changes in one's job (Wrzesniewski and Dutton, 2001; Tims and Bakker, 2010). Meta-analytical research has highlighted the importance of job crafting and has shown that it leads to numerous desirable outcomes for employees and organizations, such as work engagement and performance (Rudolph et al., 2017; Lee and Lee, 2018; Lichtenthaler and Fischbach, 2019; Boehnlein and Baum, 2022). Both job crafting outcomes have been identified as important for organizations (e.g., Bakker and Albrecht, 2018) and are the most studied variables related to job crafting (Gemmano et al., 2020). According to the conservation of resources theory (COR; Hobfoll, 1989), job crafting enables employees to create a resourceful work environment (i.e., resource investment behavior), which enhances work engagement and offers them the opportunity to do their job well. Given its positive effects, understanding job crafting antecedents is crucial for fostering self-initiated changes to the job. Following another principle of COR theory, an initial resource reservoir enables employees to increase further resources that ultimately tend to form resource caravans (Hobfoll, 2002). Thus,

an increase in work engagement and performance through job crafting may further facilitate the mobilization of resources, whereby job crafting can be used again for this purpose.

Combining these two directions, job crafting, work engagement, and performance cannot be labeled solely as antecedents or outcomes. Rather, job crafting, work engagement, and performance can be reciprocally related to one another over time, indicating the cyclical nature of the relationships (i.e., gain cycles; [Hobfoll, 2002](#)) between these constructs. Some studies have investigated the reciprocal relationship between job crafting and work engagement ([Harju et al., 2016](#); [Vogt et al., 2016](#); [Lichtenthaler and Fischbach, 2019](#)). However, the results are inconsistent, do not include performance, consider long time intervals (e.g., 3 years), and mix between-unit (i.e., stable differences between employees; also known as between-person) and within-person (i.e., intraindividual dynamics within employees) effects. Since employees work in a dynamic work environment, they have to respond to changing situations. As a result, job crafting fluctuates *within* an employee over short periods (e.g., weekly; [Petrou et al., 2017](#)). Given these fluctuations, it is important to know whether job crafting induces short-term reciprocal effects on work engagement and performance among employees. This provides more clarity as to whether (a) employees-initiated changes contribute to employees' work engagement and performance within short periods of time, (b) employees need to be engaged at work and perform well to initiate changes to their job, or whether (c) both directions are possible. Moreover, this expands the research conducted at the between-units level.

Taken together, our study extends the literature in several ways. First, we extend the COR theory by examining the role of resource investment behavior (i.e., job crafting) and how it can be predicted by its own outcomes, work engagement and performance. Revealing the reciprocal relationships between the study variables would suggest that positive job crafting outcomes influence future resource investment behavior, indicating gain cycles. Thus, not only resources are able to induce such cycles ([Xanthopoulou et al., 2009](#)) but also actions to create resources (i.e., job crafting). Second, as COR theory is a dynamic approach, the present study provides a better understanding of how job crafting, work engagement, and performance are related to each other at the within-person level from one week to the next. In contrast to many studies that examined gain cycles within the framework of COR theory at the between-unit level, our study provides insights into within-person gain cycles over a relatively short period of time (across weeks) to address the fluctuating nature of resources ([Hobfoll, 2001](#)). Furthermore, short-term resource gain cycles are important for understanding weekly work experiences, behaviors, and their effects ([Halbesleben and Wheeler, 2015](#)). Nevertheless, to maintain a holistic view of the relationships between the variables and to better understand the effects of within-person fluctuations, we also considered between-unit differences.

Third, to achieve our research aim, we used a homogenous professional group of teachers. We chose teachers because they experience similar working weeks throughout their weekly teaching rhythm, which, for example, involves teaching the same classes every week. Hence, confounding variables, which may influence our study variables, can be kept constant and controllable. Further,

on the one hand, teachers' work provides opportunities (e.g., freedom in the organization of lessons) for job crafting ([Ghitulescu, 2007](#)). On the other hand, teachers are required to make ongoing adjustments to create good classes ([Leana et al., 2009](#)), which are ensured through crafting. Additionally, owing their influence on pupils' motivation and behaviors (e.g., [Xie and Derakhshan, 2021](#)), it is crucial to have a deeper understanding of teachers' weekly experiences and behaviors at work.

Finally, this study offers an innovative methodological approach for testing the hypotheses. In the past, reciprocal relationships were calculated using cross-lagged panel models (CLPM), which consider temporal stability at the within-person level between different measurement occasions ([Hamaker et al., 2015](#)). However, CLPMs do not generally represent actual within-person-relationships over time because autoregressive relationships between study variables fail to account for the trait-like and time-invariant stabilities of constructs and mix within-person and between-unit variances ([Hamaker et al., 2015](#)). To avoid these statistical limitations, we used a random intercept cross-lagged panel model (RI-CLPM; [Hamaker et al., 2015](#)), which additionally modeled traits for each construct and partialled out between-unit variances. Thus, the specified cross-lagged effects reflect the pure within-person effects across the survey period.

## Theory and hypotheses

### Between-unit effects of job crafting on work engagement and performance

Job crafting describes a process in which employees initiate changes in their jobs to adapt to their own needs and preferences ([Wrzesniewski and Dutton, 2001](#)). To this end, three strategies can be employed: task, relational, and cognitive crafting. Employees craft their tasks by changing the scope, extent, number, or type of job tasks (e.g., teachers introduce new teaching methods that align with their interests). Relational crafting involves changes in the quality or quantity of relationships at work (e.g., teachers spend more time working with colleagues who teach the same subject). Finally, cognitive crafting refers to alterations in the cognitive representations of one's job (e.g., teachers perceive their job as preparing pupils for life, rather than simply teaching a subject).

Many meta-analytical studies have confirmed the positive impact of job crafting on various positive work-related outcomes ([Rudolph et al., 2017](#); [Lichtenthaler and Fischbach, 2019](#); [Boehnlein and Baum, 2022](#)). In this study, we focused on work engagement and performance as the most studied constructs related to job crafting ([Gemmano et al., 2020](#)). Engaged and high-performing employees are associated with better work-related well-being and employability (e.g., [Bakker and Demerouti, 2007](#); [Neuber et al., 2022](#)). First, work engagement is conceptualized as an affective, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption ([Schaufeli et al., 2002](#)). Engaged employees put more energy into their jobs, are more enthusiastic about their work, and are more fully concentrated when doing their job tasks compared to non-engaged employees. Second, we turn to performance. Performance is defined as "actions, behavior,

and outcomes that employees engage in or bring about that are linked with and contribute to organizational goals” (Viswesvaran and Ones, 2000, p. 216).

According to COR theory (Hobfoll, 1989), people strive to obtain, protect, invest, and accumulate resources at work to avoid loss of resources. While the latter has negative effects on employees, a gain in resources can stimulate further resources (i.e., gain cycles; Hobfoll, 2002). Resources at work play an important role, as they are drivers of many work-related outcomes, such as work engagement and performance (e.g., Schaufeli and Taris, 2014). Job crafting includes important actions (e.g., intensifying relationships at work) that enable employees to shape their jobs to make them more resourceful by creating a work environment that better fits their abilities, skills, or preferences (Wrzesniewski and Dutton, 2001; Tims et al., 2012). Thus, through job crafting, employees expand their pool of resources at work (Dubbelt et al., 2019), allowing them to experience personal growth and achieve their work goals (Demerouti et al., 2001). Ultimately, it has a motivating effect, for instance, on work engagement.

Furthermore, by engaging in job crafting, employees create a resourceful work environment with favorable working conditions (Lee and Lee, 2018), which facilitates more effective use of resources (Tims et al., 2013; Guan and Frenkel, 2018). Consequently, employees have more opportunities to perform well (Sørli et al., 2022; Tisu et al., 2022). For instance, intensifying relationships at work (i.e., relational crafting) employees may receive more relevant work-related information (Weseler and Niessen, 2016), which, in turn, may help increase their performance. Meta-analytical findings have confirmed positive associations between job crafting, work engagement, and performance at the between-unit level (i.e., correlations between stable differences in the constructs between employees) (Rudolph et al., 2017; Lee and Lee, 2018; Boehnlein and Baum, 2022). Although the present study focuses on within-person relationships, we aim to replicate previous research at the between-unit level and propose the following hypothesis:

*Hypothesis 1:* Job crafting is positively associated with (a) work engagement and (b) performance at the between-units level.

## Between-unit effects of work engagement and performance on job crafting

A unidirectional view of the effect of job crafting on work engagement and performance does not fully address the complex nature of these relationships. Specifically, engaged and high-performing employees are likely to engage in job crafting. These employees can be motivated to fulfill (further) work goals (Xanthopoulou et al., 2009), for which they need resources. These were provided through job crafting. To explain the reverse effects of work engagement and performance on job crafting, we build on broaden-and-build (B&B) theory. According to this theory, experiencing positive affective states (e.g., positive emotions) *broadens* an individual’s mindset (Fredrickson, 1998, 2001), which means that their thought-action repertoires are prompted to use a wider range of thoughts and actions than usual. In this way, people can *build* various resources (e.g.,

psychological and social resources; Fredrickson, 2001). For instance, employees who experience positive emotions are more likely to be creative, explore new information, or integrate different aspects of their jobs (Fredrickson, 2001). These new thoughts and actions may help employees craft their jobs by changing their tasks or relationships at work or the cognitive representation of their job.

Work engagement and performance are sources of positive emotions at work. First, by definition, work engagement includes positive affective components (Schaufeli et al., 2002). This means that if employees who are involved in their work are also enthusiastic and inspired by their work (dedication), they can experience positive arousal together with positive emotions (Bakker and Oerlemans, 2011). Second, well-performing employees receive positive feedback on their actions and behavior at work, which in turn leads them to experience positive emotions at work (Fisher and Ashkanasy, 2000; Hu and Kaplan, 2015). Furthermore, well-performing employees receive information about the effectiveness of their work (i.e., job-based feedback) and perceive their personal achievements to which they can react with positive emotions (e.g., pride; Belschak and Den Hartog, 2009). Thus, positive emotions created by work engagement and performance can, according to the B&B theory, encourage employees to think in a creative way and change their task or relational or cognitive boundaries at work proactively through job crafting. Meta-analytical support indicates that work engagement and performance are positively related to job crafting at the between-units level (Rudolph et al., 2017; Lee and Lee, 2018; Lichtenthaler and Fischbach, 2019). Hence, we hypothesize:

*Hypothesis 2:* (a) Work engagement and (b) performance are positively associated with job crafting at the between-units level.

## Within-person effects of job crafting on work engagement and performance

Although the literature confirms positive between-unit associations between job crafting and work engagement and performance, we are also interested in within-person relationships between these variables, as employees use job crafting to satisfy short-term needs (Petrou et al., 2012) in response to dynamic, demanding situations (e.g., when reframing a task-related problem). Accordingly, job crafting has been shown to fluctuate within employees (i.e., at the within-person level) between days and weeks (Petrou et al., 2012, 2017; Geldenhuys et al., 2021). As a result of short-term (i.e., daily or weekly) fluctuations in job crafting, in line with COR theory, short-term variations in employees’ resourceful work environments can affect work engagement and performance. Indeed, there is initial evidence that at the within-person level, job crafting is positively related to work engagement and performance (e.g., Bakker and Oerlemans, 2019; Kooij et al., 2020; Zampetakis, 2023). Most studies have investigated the effects of *daily* job crafting on work engagement or performance. However, the results have been inconsistent. Often, they do not reveal that daily (general) job crafting is

clearly related to daily work engagement or performance (Petrou et al., 2017; e.g., Bindl et al., 2019; Vakola et al., 2020). As job crafting involves changes and efforts that require time to unfold (Tims and Bakker, 2010), the benefits of job crafting may not materialize immediately. Perhaps, more time is needed for job crafting to affect work engagement and performance. Therefore, we propose that the consideration of *weekly* fluctuations is a more appropriate timeframe for examining within-person associations between job crafting, work engagement, and performance. Two studies examining such weekly relationships mainly supported the assumption of a temporal component (Petrou et al., 2017; Geldenhuys et al., 2021). Nevertheless, these results were obtained with single job crafting strategies (e.g., task crafting) and not with job crafting in general. Therefore, further research is required in this regard.

Our sample of teachers is well suited for obtaining deeper insight into the weekly associations between job crafting, work engagement, and performance, as a teacher's everyday work is similarly structured from one week to the next. For example, in 1 week, teachers craft their jobs (e.g., using new teaching practices to improve lessons; task crafting), which allows them to build a resourceful work environment. This, in turn, can affect their work engagement and performance the following week. Therefore, we propose:

*Hypothesis 3:* Weekly job crafting levels affect (a) weekly work engagement and (b) weekly performance from one week to the next.

## Within-person effects of work engagement and performance on job crafting

Research has revealed that work engagement and performance fluctuate within employees between days and weeks (e.g., Binnewies et al., 2010; Sonnentag et al., 2010a). In other words, employees are not equally engaged in work or do not perform their jobs equally well on all days or weeks. Moreover, fluctuations in work engagement and performance can result in fluctuating positive emotions. Employees experiencing positive emotions can broaden their thoughts and actions in the short term (e.g., weekly), which in turn may help them proactively change their work through job crafting in a short period of time.

To date, no study has investigated the within-person effects of work engagement or performance on job crafting. While longitudinal studies have examined the effect of work engagement on job crafting (e.g., Lu et al., 2014; Harju et al., 2016; Hakanen et al., 2018), these studies did not clearly separate between-unit and within-person effects. This means that previous positive associations between work engagement and job crafting are a merging of stable between-unit associations and within-person relationships. Nevertheless, one study with teachers revealed weekly fluctuations in their work engagement and performance (Bakker and Bal, 2010). Interestingly, at the within-person level, engaged teachers reported more job resources the following week (Bakker and Bal, 2010). These teachers may have created their own resourceful work environments through weekly job crafting.

However, this mechanism was not investigated in this study. The weekly structure of a teacher's job helps us to explore these reverse relationships within teachers. For example, in one week, classes go very well and teachers are engaged and receive positive feedback on their performance (e.g., through pupils' behavior), thus stimulating positive emotions. These positive emotions may, in turn, enable teachers to broaden their repertoire of actions through job crafting the following week. Therefore, we propose:

*Hypothesis 4:* (a) Weekly work engagement and (b) weekly performance affect weekly job crafting levels from one week to the next.

## Reciprocal within-person relationships between job crafting, work engagement, and performance

Combining the unidirectional and reverse effects described above, we expect that job crafting, work engagement, and performance are reciprocally related at the within-person level. According to the COR theory, resources evolve in caravans (Hobfoll, 2002), which means that resources may occur with further resources over time. Based on this proposition, we assume that a resourceful work environment, shaped by job crafting, is not only related to work engagement and performance but also stimulates gain cycles, in which work engagement and performance are also related to job crafting. Gain *cycles* can be viewed as reciprocal relationships between constructs that relate to each other over time (Salanova et al., 2011). We explicitly do not assume gain *spirals*, which include extending loops in cyclic relationships between constructs (Lindsley et al., 1995; Salanova et al., 2011), because we are not interested in an increase in the levels of job crafting, work engagement, and performance across weeks.

Investigations have been conducted on the reciprocal relationship between job crafting and work engagement (Harju et al., 2016; Vogt et al., 2016; Lichtenthaler and Fischbach, 2019; Watson and Sinclair, 2022). Surprisingly, three of them did not show reciprocal relationships between the variables but revealed unidirectional effects of work engagement on job crafting (Harju et al., 2016) and job crafting on work engagement (Vogt et al., 2016; Watson and Sinclair, 2022). Vogt et al. (2016) assumed that the relationship between the variables is more complex and that a within-person approach should be considered. A longitudinal meta-analytical investigation confirmed that promotion-focused job crafting—a specific orientation of job crafting that includes changes to realize gains at work—was reciprocally related to work engagement (Lichtenthaler and Fischbach, 2019). However, this research considered the reciprocal relationship between job crafting and work engagement for long time intervals (e.g., 3 years) and did not distinguish between-unit and within-person effects, such that the results lumped both together. Similar investigations have not been conducted on performance.

As noted by Vogt et al. (2016), reciprocal relationships must consider the within-person level. This allows for better insights into the gain cycles between job crafting, work engagement, and performance within employees. Although teachers' schedules are mainly divided into weeks, they experience various changes within

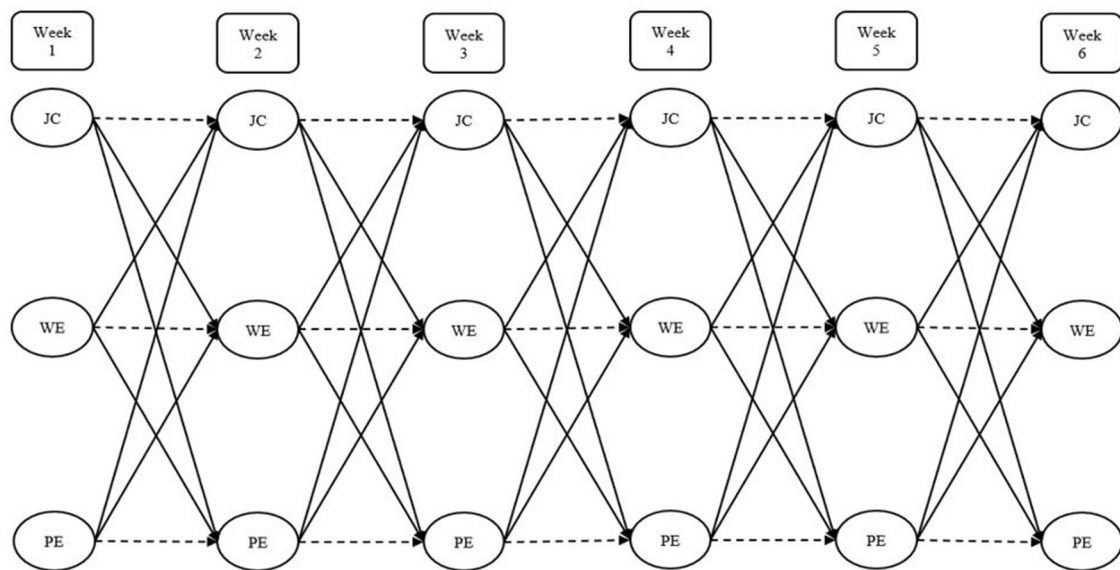


FIGURE 1  
Proposed model of reciprocal relationships between job crafting, work engagement, and performance over six weeks.

a week to which they must adapt continuously. These include a switch in teaching topics, changing dynamics in classes, or various forms of lesson preparation. Through job crafting, teachers are able to adjust their work (e.g., adapt their teaching methods) within a week, which allows them to create a resourceful work environment. According to COR theory this affects their work engagement and performance in the following week. Simultaneously, teachers who are engaged and perform their job well (e.g., successful lessons), experience positive emotions which, following B&B theory, stimulate them to explore new things by crafting their job in the subsequent week. Furthermore, considering that a high level of work engagement and performance in one week has been achieved through a resourceful work environment, these existing resources enable employees to activate further resources through job crafting. This is consistent with COR theory (Hobfoll, 1989), which states that employees with greater resources are more capable of activating resource. Thus, weekly gain cycles can be triggered by job crafting.

Over and above reciprocal relationships between job crafting, work engagement, and performance, we postulate that work engagement and performance mutually affect each other. Many studies have intensively investigated the link between work engagement and performance (Christian et al., 2011). Based on the assumption that work engagement induces positive emotions, this positive affective state can broaden people's thought-action repertoire and build enduring resources (Fredrickson, 2001). Being engaged implies engaging in tasks with more energy (vigor), experiencing enthusiasm and pride (dedication), and working intensively on tasks (absorption), which enables an individual to perform his or her job well. Studies examining the within-person level confirm this assumption. For example, weekly work engagement was positively associated with weekly performance in teachers (Bakker and Bal, 2010).

By contrast, performing well at work leads to acknowledgment and positive feedback about one's work, which strengthens work engagement (Laguna and Razmus, 2019). More specifically, performance feedback, a well-known job resource, provides employees with information about the achievement of their goals, which has external motivational potential (Schaufeli and Bakker, 2004) and can increase work engagement. Consequently, we assumed that teachers who report a higher level of performance perceive that their pupils are learning more, and, therefore, are energized and enthusiastic about their work. Due to the weekly teaching rhythm, we also expected weekly effects between performance and work engagement among teachers.

Following the proposition of gain cycles between job crafting, work engagement, and performance, we propose the following hypothesis:

*Hypothesis 5:* Weekly job crafting levels, weekly work engagement, and weekly performance are reciprocally related from one week to the next.

## Goals and contributions of the current study

Taken together, the goal of the current study was to investigate pure within-person reciprocal relationships between job crafting, work engagement, and performance. More specifically, we suggest the weekly influences of each study variable on the others (Figure 1). Therefore, we test whether job crafting acts as a resource investment behavior that, in turn, triggers gain cycles, as proposed in COR theory (Hobfoll, 2002), with work engagement and performance. This would help to better understand how

employees' job crafting not only increases their work engagement and performance but also encourages them to further use job crafting. In addition to these within-person relationships, which are intraindividual dynamic processes, we aimed to replicate findings of between-unit effects between job crafting, work engagement, and performance over a period of 6 weeks.

## Method

### Sample and procedure

The data for this study were collected from teachers in Germany between August 2018 and July 2019 using online surveys. The study was approved by the education authorities of the federal states in Germany. After receiving approval, we recruited the teachers via personal contacts as well as letters or calls to school principals and school authorities and calls using information obtained from newsletters and websites. Therefore, participants were informed about the procedure. At the beginning of the first survey, the participants had to consent to participate. After this initial survey (to assess stable baseline measures), the participants received a short questionnaire once a week in the morning (before classes started) on their chosen day for a period of 6 weeks. We used this time lag, assuming that teachers' work lives were structured according to their weekly teaching schedules. Thus, the weekly study design aimed to minimize confounding effects, such as the teaching subject and size of classes that were likely to highly influence the study variables. Participation in the study was voluntary. If desired, participants received written feedback on their responses to the study variables at the end of the study.

Based on experiences from previous projects with teachers, we aimed to recruit approximately 200 teachers. In total, 181 teachers started the initial survey, six of whom did not complete the survey. Due to the small number of dropouts, we could not conduct a dropout analysis. Because participation in the surveys on top of their daily work constituted an additional workload for teachers, we wanted to detect inattentive responses and, therefore, conducted specific long-string analyses. No participant at any given measurement occasion fulfilled the applied criterion of (a) having a string of consistent responses equal to or greater than half the length of the total scale (Curran, 2016), which (b) included an inverted item. The final sample of the study ( $N = 175$ ) consisted of 66.5% female and 33.5% male teachers with a mean age of  $M = 43.68$  ( $SD = 10.75$ ) years. Most of the participants (76.0 %) taught at high schools, 20.4% at secondary schools, and 3.6% at primary schools. The average job tenure was 15.91 years ( $SD = 11.28$ ), and the average teaching time per week was 21.90 hours ( $SD = 4.95$ ). Additionally, the participants spent an average of 16.52 hours ( $SD = 8.39$ ) per week on preparatory and follow-up work for their classes.

### Measures

As the present article focuses on the within-person approach, we only utilized data from weekly measurements. More specifically,

we used job crafting, work engagement, and performance data collected in the morning, referring to the previous working week.

### Job crafting

Job crafting was assessed using the German version (Schachler et al., 2019) of the Job Crafting Questionnaire (JCQ; Slemp and Vella-Brodrick, 2013), adapted for teachers. The scale captures the three job crafting strategies, according to Wrzesniewski and Dutton (2001). We assessed two items per subscale [e.g., "Last week I introduced new approaches to improve my teaching" (task crafting); "Last week I made an effort to get to know my colleagues at work better" (relational crafting); "Last week I remembered how important my work is to society" (cognitive crafting)]. Participants were asked to rate all items on a 5-point scale ranging from 1 (*I fully disagree*) to 5 (*I fully agree*).

### Work engagement

Work engagement was measured using the German version of the Utrecht Work Engagement Scale (UWES-9; Schaufeli et al., 2006), adapted for teachers and shortened by three items. We measured work engagement using six items, two items per aspect of work engagement: vigor (e.g., "Last week I felt bursting with energy in my classes."), dedication (e.g., "Last week I was enthusiastic about my classes.") and absorption (e.g., "Last week I felt happy when I was working intensively."). Responses were given on a 7-point scale (1 = *never*; 7 = *always*).

### Performance

Performance was operationalized with teachers' self-reports on the quality of their instruction. It is a key variable in educational research that describes the pattern of instructional behavior in classes and can predict the achievement of educational goals (Weinert et al., 1989). One dimension of teachers' instructional quality is individual learning support – the extent to which pupils receive personal support from teachers, stimulating their individual learning processes, and offering help when difficulties occur (Kunter and Baumert, 2006). The scale (Baumert et al., 2009) consists of seven items (e.g., "I take care of my pupils when they have problems"); responses were given on a 6-point scale (1 = *I fully disagree*; 6 = *I fully agree*).

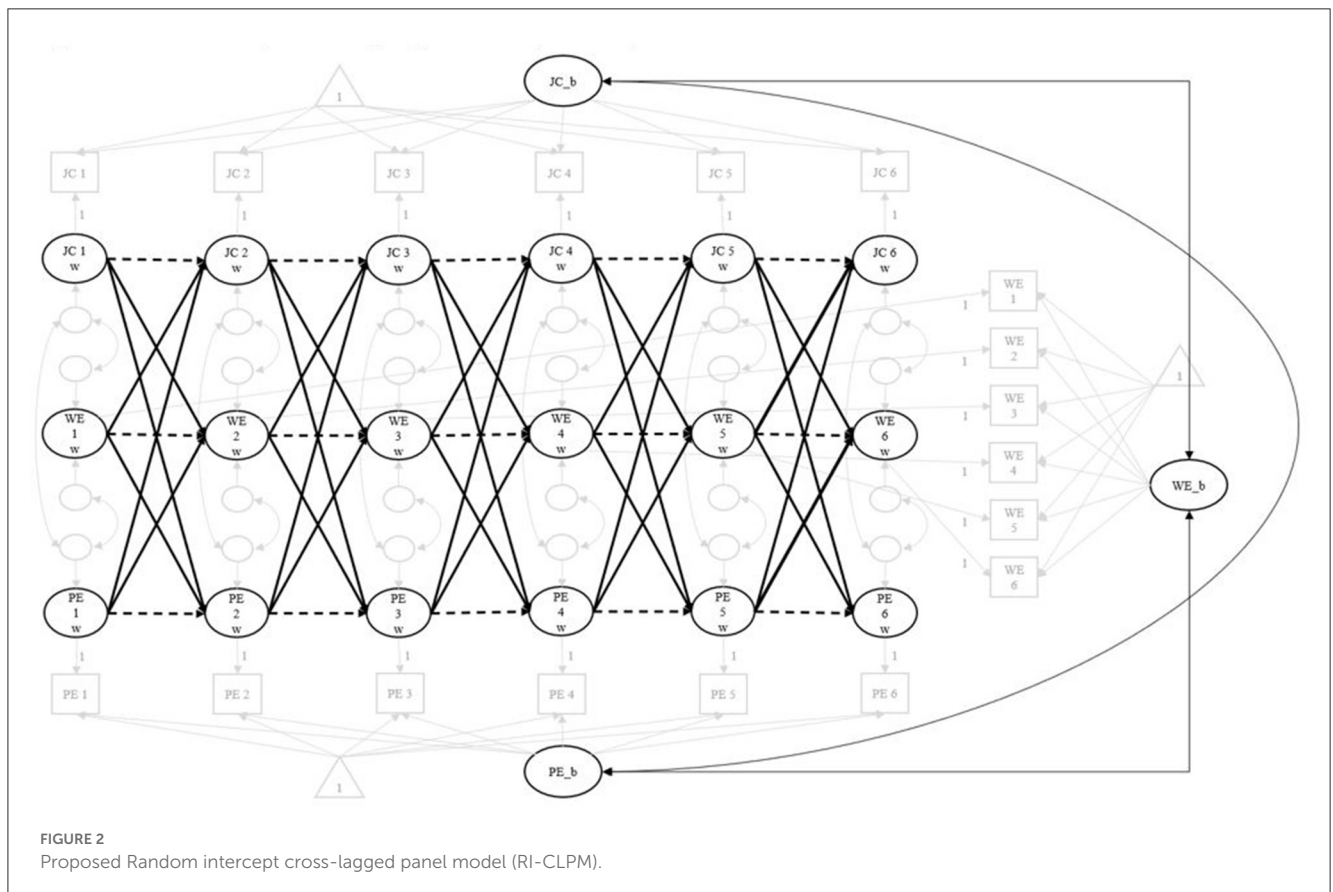
### Data analysis

All analyses were performed in R Studio (RStudio Team, 2021) using the lavaan package (Rosseel, 2015). First, we conducted confirmatory factor analyses to examine the measurement invariance of job crafting, work engagement, and performance over time. Table 1 summarizes the model fits. We fit four CFA models with increasing restrictions imposed on the model parameters. Beyond the chi-square difference tests, we considered changes in different fit indices (e.g., CFI and RMSEA). Following Chen's (2007) recommendations for small sample sizes (i.e., <300),  $\Delta CFI$ ,  $\Delta RMSEA$ , and  $\Delta SRMR$  were no  $>0.005$ , 0.10, or 0.025,

TABLE 1 Summary of measurement invariance models.

Model	$\chi^2$	df	p-value	$\Delta\chi^2$	$\Delta$ df	p-value	CFI	RMSEA (CI 90%)	SRMR	AIC	BIC
Configural	1,650.7	522	<0.001				0.804	0.138 (0.131; 0.146)	0.095	25,499.107	26,801.470
Metric	1,727.4	582	<0.001	76.637	60	0.073	0.801	0.132 (0.125; 0.139)	0.099	25,455.744	26,486.781
Scalar	1,796.2	642	<0.001	68.871	60	0.202	0.800	0.126 (0.119; 0.133)	0.103	25,404.615	26,164.327
Strict	1,809.9	657	<0.001	13.684	15	0.550	0.800	0.124 (0.118; 0.131)	0.104	25,388.299	26,080.179

Note. Configural = no restrictions. Metric = factor loadings are constrained to be equal. Scalar = factor loadings and intercepts are constrained to be equal. Strict = factor loadings, intercepts and means constrained to be equal.



respectively. Thus, we assumed that these measures remain invariant over time.

To test our hypotheses, we used random intercept cross-lagged panel models (RI-CLPM; Figure 2). These models are an extension of traditional cross-lagged panel models (CLPM) and account for stable, trait-like differences between individuals (Hamaker et al., 2015). This means that stable differences between teachers' job crafting, work engagement, and performance can be distinguished from the fluctuating states of job crafting, work engagement, and performance. To estimate the average, stable between-unit differences, we specified latent intercept factors for each variable, with factor loadings constrained to one. That is, between-unit scores represent individuals' deviations from the grand means over six weeks. The within-person components of job crafting, work engagement, and performance were specified as latent variables referring to intrapersonal deviations from the expected person-specific scores (Mulder and Hamaker, 2021).

Autoregressive effects reflect the extent to which within-person deviations in one variable (e.g., job crafting) can be predicted by preceding deviations from one's expected score for that variable. Thus, autoregressive parameters can be viewed as within-person carry-over effects (Hamaker et al., 2015). Cross-lagged effects indicate the extent to which deviations from one's expected score for a variable (e.g., work engagement) can be predicted by preceding deviations from one's expected score for another variable (e.g., job crafting level).

The structural part of RI-CLPM was gradually extended and tested. In the first model (M1, the stability model), we estimated autoregressive effects only. Second, we include the cross-lagged effects of job crafting on work engagement and performance (M2). Third, we added the reverse effects of work engagement and performance on job crafting (M3). Fourth, we tested the full RI-CLPM, including the reciprocal relationships between job crafting, work engagement, and performance (M4). Finally, we

extended Model 4 by constraining the autoregressive loadings of each construct to be equal over time (M5) to address the given measurement invariances. We consider sex, age, working hours, and tenure as possible control variables. The results showed that these variables did not influence the effects of job crafting, work engagement, or performance. Because the chi-square difference test indicated no significant difference between the models with and without control variables [ $\Delta\chi^2(60) = 0.76.824, p = 0.071$ ], we did not include the control variables further because of parsimony.

For the model estimation, we used the maximum likelihood estimator with robust standard errors, which is robust against violations of normality, and full-information maximum likelihood estimation to account for missing data on single occasions. All models (M1 – M5) were assessed based on the criteria for model fit (Marsh et al., 2005) and compared using AIC, BIC, and chi-square difference tests. Cross-lagged effects (i.e., standardized effect sizes) were interpreted based on benchmark values (Orth et al., 2022).

## Results

Table 2 presents means, standard deviations, and intercorrelations of the study variables for each week. Intraclass correlations (ICCs) for the study variables ( $ICC_{jc} = 0.65$ ,  $ICC_{we} = 0.59$ ,  $ICC_{pe} = 0.52$ ) implied sufficient within-person variability in job crafting, work engagement, and performance. The fit indices of the models are listed in Table 3. The full RI-CLPM (M4) showed good model fit. Although the model fit of Model 5 was not statistically distinguishable from that of Model 4, because of the sake of parsimony, we report and interpret the parameter estimates for Model 5. Table 4 and Figure 3 present the parameter estimates for this model.

At the between-unit level, there were positive correlations between job crafting and work engagement ( $r = 0.266; p = 0.030$ ) and between job crafting and performance ( $r = 0.338; p = 0.005$ ), supporting Hypotheses 1 and 2. At the within-person level, job crafting levels, work engagement, and performance correlated within weeks (i.e., cross-sectional associations). Furthermore, the autoregressive effects of job crafting (mean  $\beta = 0.333$ , range: 0.306–0.347) and performance (mean  $\beta = 0.147$ , range: 0.092–0.200) indicated positive carry-over effects (i.e., within-person deviations from the individual mean predicted deviations from the individual mean in the next week) of job crafting and performance between the weeks within teachers. By contrast, the autoregressive effects of work engagement (mean  $\beta = 0.081$ , range: 0.058–0.127) varied across the six weeks.

Regarding the effects of job crafting (i.e., Hypothesis 3), at the within-person level, on average, job crafting level predicted work engagement (mean  $\beta = 0.205$ , large effect size; range: 0.043–0.451) and performance (mean  $\beta = 0.040$ , small to medium effect size; range:  $-0.191$ – $0.281$ ) in the following week. Thus, Hypothesis 3a is supported. However, unexpectedly, we also found a negative association between job crafting (T1) and performance (T2) (i.e., a large effect size;  $\beta = -0.191$ ). That means that teachers who reported job crafting above their expected score in Week 1, were likely to report performance below their expected score in Week 2. Accordingly, Hypothesis 3b was not supported.

Regarding the reverse effects of work engagement and performance (i.e., Hypothesis 4), at the within-person level, work engagement partially predicted job crafting levels the next week (mean  $\beta = 0.090$ , medium to large effect size; range: 0.013–0.264), thus partially supporting Hypothesis 4a. However, performance did not predict job crafting levels (mean  $\beta = 0.037$ , small to medium effect size; range:  $-0.046$ – $0.083$ ) across weeks. Thus, Hypothesis 4b is not supported.

Regarding reciprocal relationships (i.e., Hypothesis 5, Figure 3), although job crafting levels predicted work engagement and vice versa, these cross-lagged effects were time shifted (Weeks 3 and 4; Week 5), and no reciprocal relationship was found. In addition, we found no evidence of a reciprocal relationship between job crafting levels and performance across weeks. However, our results suggest a reciprocal relationship between work engagement and performance from one week to another. Interestingly, the cross-lagged effects varied greatly and were both positive and negative (work engagement on performance: mean  $\beta = -0.110$ , medium to large effect size; range:  $-0.355$ – $0.283$ ; performance on work engagement: mean  $\beta = -0.030$ , small effect size; range:  $-0.392$ – $0.156$ ). For example, teachers who reported work engagement above their expected score in Week 2 were likely to report performance below their expected score in Week 3. In sum, these results do not support Hypothesis 5.

## Sensitivity analyses

To check whether results would change considering the different job crafting strategies (i.e., task, cognitive, and relational crafting), we conducted three separate RI-CLPM. Overall, there was no reciprocal relationship between task, cognitive, or relational crafting levels and work engagement and performance. Only cognitive crafting levels and work engagement had cross-lagged effects, but these were also time shifted. The different effect sizes changed substantially across weeks. For task crafting levels, neither work engagement (mean  $\beta = 0.033$ , small to medium effect size; range:  $-0.203$ – $0.160$ ) nor performance (mean  $\beta = -0.040$ , small to medium effect size; range:  $-0.123$ – $0.026$ ) predicted task crafting levels. Task crafting levels did not predict work engagement (mean  $\beta = 0.031$ , small to medium effect size; range:  $-0.073$ – $0.178$ ) or performance (mean  $\beta = -0.019$ , small effect size; range:  $-0.233$ – $0.152$ ) in the following week. For cognitive crafting levels, only work engagement predicted cognitive crafting levels (mean  $\beta = 0.179$ , large effect size; range:  $-0.094$ – $0.341$ ) in the following week; performance did not (mean  $\beta = 0.012$ , small effect size; range:  $-0.156$ – $0.223$ ). On average, cognitive crafting levels predicted work engagement in the following week (mean  $\beta = 0.151$ , large effect size; range:  $-0.215$ – $0.325$ ) but not performance (mean  $\beta = 0.021$ , small effect size; range:  $-0.248$ – $0.442$ ). For relational crafting, neither work engagement (mean  $\beta = 0.043$ , small to medium effect size; range:  $-0.179$ – $0.235$ ) nor performance (mean  $\beta = 0.095$ , medium to large effect size; range:  $-0.106$ – $0.242$ ) predicted relational crafting levels. In contrast, relational crafting levels, on average, predicted work engagement (mean  $\beta = 0.152$ , large effect size; range:  $-0.117$ – $0.410$ ) the next week, but not



TABLE 2 Means, standard deviations, reliability estimators, and zero-order correlations of job crafting, work engagement, and performance over six weeks.

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Job crafting T1	2.48	0.66	(0.67/0.59)																	
2. Job crafting T2	2.50	0.68	<b>0.73</b>	(0.71/0.65)																
3. Job crafting T3	2.51	0.67	<b>0.63</b>	<b>0.69</b>	(0.71/0.65)															
4. Job crafting T4	2.45	0.74	<b>0.66</b>	<b>0.66</b>	<b>0.71</b>	(0.76/0.68)														
5. Job crafting T5	2.49	0.76	<b>0.58</b>	<b>0.60</b>	<b>0.72</b>	<b>0.82</b>	(0.76/0.61)													
6. Job crafting T6	2.37	0.75	<b>0.62</b>	<b>0.64</b>	<b>0.65</b>	<b>0.75</b>	<b>0.78</b>	(0.79/0.79)												
7. Work engagement T1	4.66	0.71	<b>0.24</b>	<b>0.25</b>	0.09	<b>0.21</b>	<b>0.20</b>	0.12	(0.85/0.85)											
8. Work engagement T2	4.53	0.78	<b>0.23</b>	<b>0.34</b>	<b>0.23</b>	<b>0.31</b>	<b>0.25</b>	<b>0.20</b>	<b>0.64</b>	(0.91/0.91)										
9. Work engagement T3	4.51	0.86	<b>0.22</b>	<b>0.30</b>	<b>0.37</b>	<b>0.36</b>	<b>0.34</b>	<b>0.28</b>	<b>0.63</b>	<b>0.67</b>	(0.89/0.89)									
10. Work engagement T4	4.56	1.03	<b>0.32</b>	<b>0.37</b>	<b>0.33</b>	<b>0.52</b>	<b>0.31</b>	<b>0.27</b>	<b>0.59</b>	<b>0.64</b>	<b>0.68</b>	(0.94/0.94)								
11. Work engagement T5	4.66	0.84	0.18	0.22	0.19	<b>0.40</b>	<b>0.37</b>	<b>0.33</b>	<b>0.60</b>	<b>0.72</b>	<b>0.66</b>	<b>0.64</b>	(0.91/0.90)							
12. Work engagement T6	4.53	0.89	<b>0.23</b>	<b>0.25</b>	<b>0.24</b>	<b>0.32</b>	<b>0.28</b>	<b>0.40</b>	<b>0.49</b>	<b>0.58</b>	<b>0.68</b>	<b>0.53</b>	<b>0.66</b>	(0.92/0.91)						
13. Performance T1	4.58	0.85	<b>0.31</b>	<b>0.33</b>	<b>0.21</b>	<b>0.32</b>	<b>0.33</b>	<b>0.32</b>	<b>0.42</b>	<b>0.24</b>	<b>0.30</b>	<b>0.33</b>	<b>0.28</b>	<b>0.36</b>	(0.80/0.82)					
14. Performance T2	4.55	0.88	0.07	<b>0.24</b>	0.14	<b>0.23</b>	0.17	0.18	0.11	<b>0.29</b>	<b>0.39</b>	<b>0.24</b>	<b>0.25</b>	<b>0.37</b>	<b>0.42</b>	(0.86/0.87)				
15. Performance T3	4.70	0.94	0.11	0.11	<b>0.23</b>	<b>0.23</b>	<b>0.28</b>	<b>0.21</b>	0.14	<b>0.23</b>	<b>0.41</b>	<b>0.36</b>	<b>0.25</b>	<b>0.44</b>	<b>0.47</b>	<b>0.56</b>	(0.87/0.87)			
16. Performance T4	4.47	1.15	<b>0.33</b>	<b>0.36</b>	<b>0.26</b>	<b>0.36</b>	<b>0.37</b>	<b>0.22</b>	<b>0.27</b>	<b>0.39</b>	<b>0.33</b>	<b>0.47</b>	0.20	<b>0.32</b>	<b>0.59</b>	<b>0.54</b>	<b>0.56</b>	(0.90/0.92)		
17. Performance T5	4.68	1.02	0.14	<b>0.23</b>	0.18	<b>0.21</b>	<b>0.26</b>	<b>0.21</b>	0.18	<b>0.36</b>	<b>0.33</b>	0.13	<b>0.22</b>	<b>0.35</b>	<b>0.44</b>	<b>0.49</b>	<b>0.58</b>	<b>0.62</b>	(0.92/0.92)	
18. Performance T6	4.64	0.96	<b>0.22</b>	<b>0.24</b>	<b>0.27</b>	<b>0.28</b>	<b>0.33</b>	<b>0.32</b>	<b>0.32</b>	<b>0.40</b>	<b>0.52</b>	<b>0.35</b>	<b>0.48</b>	<b>0.53</b>	<b>0.64</b>	<b>0.55</b>	<b>0.77</b>	<b>0.53</b>	<b>0.68</b>	(0.85/0.85)

Note.  $N = 175$ . T1 = Time 1; T2 = Time 2; T3 = Time 3, T4 = Time 4; T5 = Time 5; T6 = Time 6. Alpha/Mc Donald's omega coefficients are presented in parenthesis.

Bold correlation parameters indicate significant results with at least  $p < 0.05$ .

TABLE 3 Goodness-of-fit indices and comparison of the competing models.

Model	$\chi^2$	df	p-value	$\Delta\chi^2$	$\Delta$ df	p-value	CFI	RMSEA (CI 90%)	SRMR	AIC	BIC
M1	182.725	114	<0.001				0.950	0.061 (0.044; 0.078)	0.085	4,126.042	4,356.210
M2	176.551	104	<0.001	8.173	10	0.612	0.948	0.066 (0.049; 0.083)	0.083	4,136.059	4,396.916
M3	173.309	104	<0.001	0.074	0	0.999	0.949	0.065 (0.047; 0.081)	0.084	4,135.985	4,396.842
M4	121.942	84	0.004	49.187	20	<0.001	0.973	0.052 (0.030; 0.072)	0.080	4,121.941	4,444.176
M5	128.293	96	0.015	10.722	12	0.553	0.975	0.046 (0.022; 0.068)	0.077	4,116.812	4,402.221

Note.  $\chi^2$  Chi-square goodness of fit statistics; CFI comparative fit indices; RMSEA root mean square error approximation; CI 90% confidence interval; SRMR standardized root mean square residual; AIC Akaike information criterion; BIC Bayesian information criterion; the  $\chi^2$ -difference test was used to compare the different structural models. M1 stability model. M2 unidirectional effects: job crafting as predictor of work engagement and performance in the next week. M3 reverse effects: work engagement and performance as predictors of job crafting in the next week. M4 full random intercept cross-lagged panel model (RI-CLPM). M5 RI-CLPM with fixed autoregressive loadings to be equal over time.

TABLE 4 Summary of the relevant RI-CLPM parameter estimates of Model 5.

Parameters	Standardized mean effect size <sup>a</sup> [95 % confidence intervals]	p-value	Range	
			Lowest standardized effect size	Highest standardized effect size
<b>Between-unit level</b>				
Correlations				
JC – WE	0.266 [0.112; 0.404]	0.030		
JC – PE	0.338 [0.193; 0.469]	0.005		
WE – PE	0.527 [0.405; 0.631]	<0.001		
<b>Within-person level</b>				
Autoregressive effects				
JC T <sub>k</sub> – JC T <sub>k+1</sub>	0.333 [0.178; 0.493]	<0.001		
WE T <sub>k</sub> – WE T <sub>k+1</sub>	0.081 [–0.101; 0.267]	0.378		
PE T <sub>k</sub> – PE T <sub>k+1</sub>	0.147 [0.010; 0.258]	0.035		
	Standardized mean effect size <sup>b</sup>	surrounding anchor <sup>c</sup> of the mean effect size		
Cross-lagged effects				
JC T <sub>k</sub> – WE T <sub>k+1</sub>	0.205	Large effect	0.043	0.451
WE T <sub>k</sub> – JC T <sub>k+1</sub>	0.090	Medium to large effect	0.013	0.264
JC T <sub>k</sub> – PE T <sub>k+1</sub>	0.040	Small to medium effect	–0.191	0.281
PE T <sub>k</sub> – JC T <sub>k+1</sub>	0.037	Small to medium effect	–0.046	0.083
WE T <sub>k</sub> – PE T <sub>k+1</sub>	–0.110	Medium to large effect	–0.355	0.283
PE T <sub>k</sub> – WE T <sub>k+1</sub>	–0.030	Small effect	–0.392	0.156

Note. N = 159. JC = Job crafting. WE = Work engagement. PE = Performance. <sup>a</sup>at the between-unit level, these estimates are correlations. <sup>b</sup>mean effect sizes were calculated manually. <sup>c</sup>according to (Orth et al., 2022). T = Time.

performance (mean  $\beta = 0.041$ , small to medium effect size; range: –0.072–0.113).

## Discussion

The present paper aimed to investigate whether job crafting levels, work engagement, and performance relate reciprocally at the within-person level on a weekly basis. Our results reveal that job crafting levels, work engagement, and performance are moderately to highly related within weeks. Second, across weeks,

job crafting levels affect work engagement from one week to the next and vice versa, but these effects are not simultaneous. Instead, our evidence indicates time-shifted cross-lagged effects between job crafting and work engagement. Furthermore, job crafting levels were related to performance from one week to the next, but there was no reverse effect of performance on job crafting levels at the within-person level. Finally, work engagement and performance had a reciprocal relationship across weeks, with the magnitude and direction of the relationship varying substantially. These effects were not influenced by age, sex, tenure, or working hours.

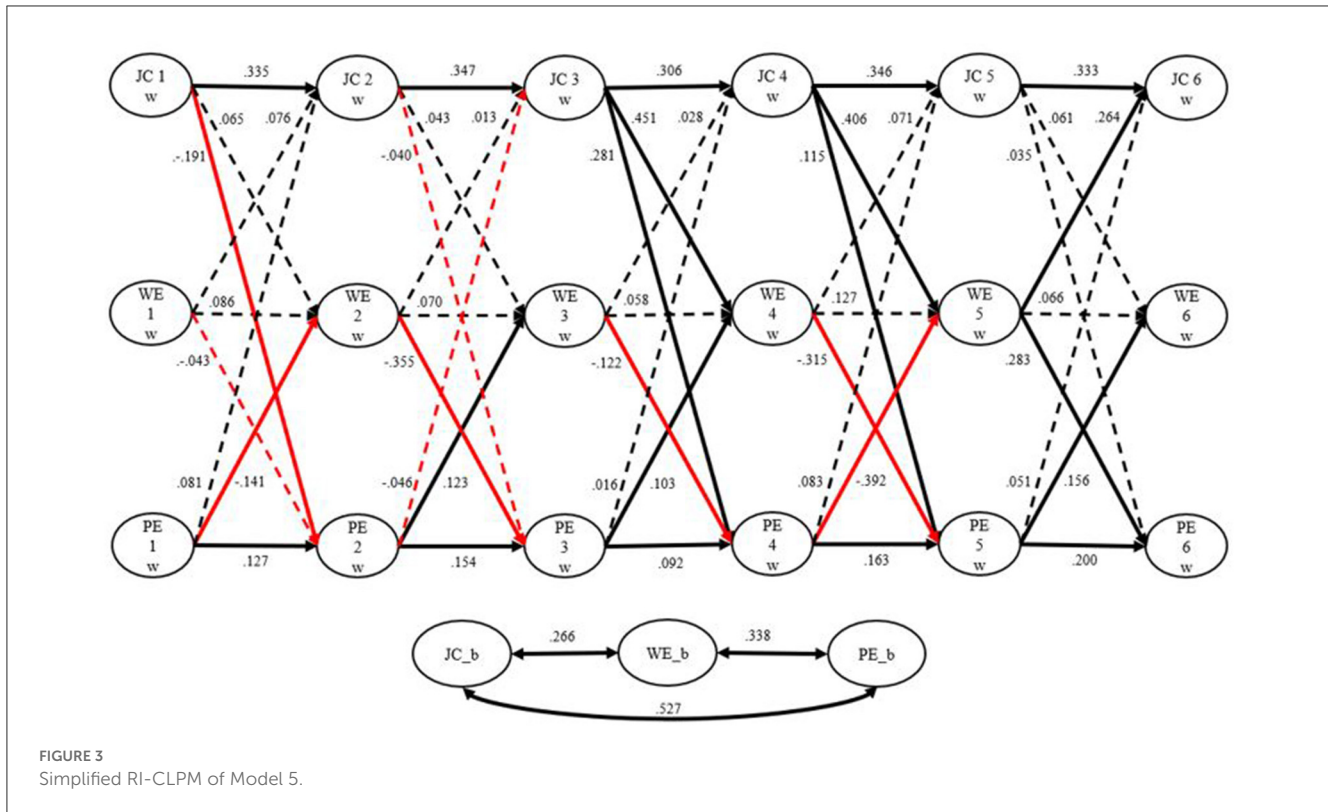


FIGURE 3  
Simplified RI-CLPM of Model 5.

## Between-unit relationships between job crafting, work engagement, and performance

Although the results at the within-person level were heterogeneous, at the between-unit level, we found support for positive relationships between job crafting, work engagement, and performance. The between-unit relationships indicate that in general, teachers who report higher levels of job crafting are more engaged and report higher levels of performance. By separating the between-unit from the within-person part, we can interpret these correlations independently of their fluctuations within the teachers over time. These findings are consistent with those of previous studies (see meta-analyses and reviews; Rudolph et al., 2017; Lee and Lee, 2018). Regardless of fluctuations within teachers across weeks, it seems that by adopting one's job according to their preferences and needs, teachers create a resourceful work environment (Dubbelt et al., 2019) in which they experience a positive state of mind and can perform their job well. In the following, we discuss the within-person relationships between the study variables, some of which are heterogeneous.

## Within-person relationships between job crafting, work engagement, and performance

Prior research has examined the within-person relationships between job crafting and work engagement or performance.

However, this is the first study that considered (a) unique within-person effects by applying an RI-CLPM (Figure 2) and (b) investigated the reciprocal relationships between study variables from one week to the next. First, previous research shows that job crafting and work engagement are related at the within-person level (e.g., Petrou et al., 2017; Bakker and Oerlemans, 2019), thus indicating that, for instance, weekly fluctuations in job crafting affect weekly work engagement. These results are important because they allow us to show that in weeks in which employees reported a high level of job crafting, they also reported a high level of work engagement. We can support these results in our study as there were moderate to high correlations between job crafting levels and work engagement within weeks. However, our within-person effects provide further information about cross-lagged effects, such as the effect of job crafting levels on work engagement in the following week. On average, job crafting levels in one week predicted work engagement in the following week. Inversely, the cross-lagged effects of work engagement in one week on job crafting levels in the next week were inconsistent and differed in magnitude. Similar weak reverse effects (particularly at the between-unit level) have also been found in recent research (Watson and Sinclair, 2022; Zampetakis, 2023). Watson and Sinclair (2022) argued that, for instance, job crafting seems to be more needs-driven and fulfills psychological needs (e.g., autonomy; Deci and Ryan, 2000), such that employees improve their work engagement in this way. Maybe there is no more need that could be fulfilled with job crafting, which could explain the reverse effects.

Nevertheless, the potential for dual-pathways between job crafting and work engagement exists (Watson and Sinclair, 2022), and their within-person relationship is dynamic and bidirectional.

Although we did not find simultaneous cross-lagged effects between job crafting and work engagement (i.e., a reciprocal relationship) across weeks, both variables predicted each other. Thus, creating a resourceful work environment through job crafting increases employees' level of work engagement the next week. This positive motivational state enables employees to widen their thoughts and ideas and see opportunities to enhance positive aspects at work (Vogt et al., 2016) and, again, engage in job crafting in the subsequent week. This would fit the assumptions of the B&B theory (Fredrickson, 1998), such that positive emotions triggered through work engagement facilitate employees' use of job crafting. However, we were unable to test this assumption. Furthermore, research has revealed that positive emotions are not clear predictors of job crafting (Rogala and Cieslak, 2019). Instead, work engagement can be considered an excess resource (e.g., Hakanen et al., 2018). Thus, our results are in line with COR theory, as employees who perceive resources are motivated to increase their resource pool (Hobfoll, 1989). Further, our results extend COR theory by showing that not only resources themselves but also *actions* creating resources (i.e., job crafting) act in cycles with work engagement within employees. As job crafting represents resource investment behavior (i.e., an increase in resources requires investing resources; Hobfoll, 1989), it creates resources in the form of work engagement (Hakanen et al., 2018) among employees. This positive state, full of resources, enables employees to use resource investment behavior by adjusting their work. In summary, this study offers indications of the role of resource investment behavior (i.e., job crafting) in the resource gain cycle process.

Second, our results show that job crafting levels and performance are related within weeks. However, they did not reciprocally relate from one week to the next. On average, job crafting levels in one week positively predicted performance the next week, which is in line with our expectations. That is, job crafting in one week builds resources that enable teachers to perform their jobs well the next week. Surprisingly, we also found an exception to this: Job crafting levels in Week 1 were negatively related to performance one week later (Week 2). In other words, teachers who reported job crafting above their expected score in Week 1 reported performance below their expected score in Week 2. This exception can be explained as follows: Although engaging in job crafting means building a resourceful work environment, doing so requires resources and energy (Wang and Lau, 2021). Consequently, teachers may consume resources on job crafting in one week and therefore have fewer resources available to provide support to their pupils – our performance indicator – in the following week. We may also observe a measurement effect. By asking teachers about job crafting in Week 1, we may have encouraged them to think more critically about their performance in Week 2. Given that we found only one negative association between job crafting and performance, care should be taken not to overinterpret this effect. Contrary to our assumption, performance did not predict job crafting levels in the following week. We again refer to the needs-perspective of job crafting by assuming that job crafting can satisfy human needs, which, in turn, enhances performance (Slemp and Vella-Brodrick, 2014; de Bloom et al., 2020). However, this satisfaction may reduce engagement in job crafting the following week. According to de Bloom et al. (2020),

needs satisfaction through job crafting in one week provided optimal functioning in the next week, which was operationalized with high performance. As psychological needs were satisfied, employees could complete the “ongoing process” and did not engage in further crafting actions predicted by their performance. However, we did not test for psychological needs and their possible satisfaction, which should be addressed in job crafting-performance pathways in future research.

Third, work engagement and performance were moderately to highly correlated within weeks. In other words, when teachers were more engaged in one week, they reported a high level of performance in the same week. This is in line with previous research (Bakker and Bal, 2010). In addition, at the between-unit level, the association between work engagement and performance was positive ( $r = 0.58, p < 0.001$ ), indicating that engaged teachers generally perform better. Furthermore, across weeks, work engagement and performance are reciprocally related at the within-person level, with the effects varying greatly in magnitude and direction. Contrary to the findings at the between-unit level and within weeks, most of the cross-lagged effects (i.e., across weeks) were negative at the within-person level. That means that teachers who were more engaged than usual in a week reported a lower level of performance than expected in the next week, and vice versa. Despite the widely confirmed positive impact of work engagement on performance, there is also a potential “dark side” of work engagement (Sonnetag, 2011), which could perhaps explain this relationship across weeks. We argue that engaged employees are willing to “go the extra mile” (Schaufeli and Salanova, 2008, p. 152) by investing effort and resources. In general, employees' performance over short periods (e.g., a week) benefits from resource allocation (Beal et al., 2005) to tasks. In this study, resource allocation was measured using individual learning support. It is possible that a high level of work engagement may result in teachers consuming so many resources in one week that they allocate fewer resources to support their pupils (i.e., performance) in the next week. Indeed, Baethge et al. (2021) corroborated that work engagement over a workweek is a physiologically depleted resource. Furthermore, a longitudinal study on work engagement, job demands, and detachment revealed the finding that work engagement actually increased job demands 12 months later (Sonnetag et al., 2010b). Conceivably, similar effects may occur within shorter periods (Reis et al., 2016), for example, from one week to the next. This could lead to the finding that engaged teachers in one week also perceive an increase in job demands in the same week. Consequently, the concurrence of depleted resources and high job demands may affect teachers' performance the following week.

When considering the reverse effect of performance on work engagement, the behavior of pupils could be a reason why performance has negative cross-lagged effects on work engagement the next week. Following the concept of reciprocity (Adams, 1965), teachers who report a high level of performance (i.e., high individual learning support) are likely to expect a reward for the support they provide (e.g., positive results and feedback; Van Horn et al., 2001). However, pupils may not always appreciate this support, and may not respond to teachers in the desired manner. This lack of reciprocity has been shown to be negatively associated

with teachers' work-related well-being (Van Horn et al., 2001), and can be demotivating. On the other hand, supporting pupils (i.e., performance) is demanding and consumes resources, and teachers may have problems separating themselves from pupils' concerns. Consequently, such teachers may experience high demands and lack of resources, thereby decreasing their level of work engagement (Demerouti et al., 2001). To complicate things, our results also revealed positive cross-lagged effects between work engagement and performance from 1 week to the next, as hypothesized. It is highly likely that the boundary conditions investigated in this study lead to either positive or negative associations. Therefore, at the within-person level, solid conclusions cannot be drawn regarding the relationship between work engagement and performance across weeks. Thus, further investigations that consider the boundary conditions are required.

## Strengths, limitations, and future research

To our knowledge, this is the first study to examine the reciprocal relationships among job crafting levels, work engagement, and performance over six weeks at the within-person level. To this end, we used the RI-CLPM (Hamaker et al., 2015), which allows the decomposition of variance into stable between-unit associations and temporal within-person fluctuations. Thus, our results indicate pure within-person effects from one week to another. Despite these advantages, this study has some limitations.

First, when interpreting the effects of the RI-CLPM (Model 5), we did not report only significant effects, but also medium to large and large effect sizes (i.e., standardized cross-lagged estimates above .10; Orth et al., 2022), which were not always statistically significant. Although reporting significant results based on *p*-values has been the dominant procedure in applied psychology, it has several disadvantages (Dunleavy et al., 2006). For instance, the significance of the effect size depends on the sample size. Thus, a statistical test is more likely to be significant for a large sample (Sullivan and Feinn, 2012; Funder and Ozer, 2019). Our study had a satisfactory sample size ( $N = 175$ ). However, it was too small to render medium to large cross-lagged effects statistically significant. Statistical significance is defined as the examination of whether the results occur by chance. By contrast, effect size reflects the magnitude of an effect (Sullivan and Feinn, 2012). Therefore, we followed the recommendation of Funder and Ozer (2019) of reporting and interpreting effect sizes regardless of the significance of the effects.

Second, the reliability estimators of the job crafting scale were low in some cases compared with the reliabilities of the other constructs. However, the estimators were similar to the results of a German validation study of the JCQ (Schachler et al., 2019). Furthermore, other studies have reported low reliability when job crafting is assessed at the within-person level (e.g., Tims et al., 2014). The reasons for this are twofold: First, due to parsimony, each subdimension was only assessed with two items instead of five, such that the reliability may decrease. Second, job crafting actions assessed in the weekly diaries were possibly used less during

the weeks, which may decrease inter-item correlations that affect reliability estimators (Tims et al., 2014).

Third, the generalizability of our study's results is limited because the investigated sample consisted only of teachers. Although we found evidence for a cyclic relationship between job crafting levels and work engagement, and for a reciprocal relationship between work engagement and performance from one week to the next, we do not know the extent to which we can generalize these findings. Future studies should investigate the reciprocal relationships between the study variables among employees of other occupational groups. In addition, other time intervals (e.g., from one day to the next) can be considered to examine these relationships. Despite this limitation, we want to emphasize that our sample was well suited for examining reciprocal relationships on a weekly basis, as we were able to minimize possible confounding effects through teachers' weekly teaching schedules. However, looking at the weekly mean scores of job crafting (below the mid-point of the scale), it seems that our sample was limited using job crafting in a week. Although teachers are associated with high levels of job control, they must consider curricula such that weekly adjustments to their work are impossible. Furthermore, they must be tailored to the needs and preferences of pupils. It is often confirmed that teachers experience a high level of job demands, and are therefore exhausted (e.g., Dicke et al., 2018). Both can reduce the use of job crafting (e.g., Solberg and Wong, 2016) or influence the effects of work engagement and performance. All of these points could be conditions that weakened the effects. As we did not assess them, future studies should investigate whether teachers are able to craft their job within a week and, if not, why this is the case and whether there are boundary conditions that weaken the effects of job crafting.

Fourth, to assess performance, we used the concept of individual learning support as a specific form of teachers performance (Baumert et al., 2009). Using this scale, performance was assessed based on teachers' support of their pupils. This is a highly relevant measure of instructional quality among teachers. However, their work includes other components of performance, such as the quality of teaching or consultations with parents. Given this specific measure of performance, it is difficult to compare the findings with those of other studies that have investigated the relationships between job crafting, work engagement, and performance. In addition, we acknowledge that there was a mismatch between the study variables regarding their level of specificity. While job crafting and work engagement were measured at a more general level, performance referred to a specific task of teachers and a specific class. With their matching hypothesis, de Jonge and Dormann's (2006) argue that associations are stronger and more consistent when variables refer to the same level of specificity. Therefore, we recommend that future studies assess all the three constructs at a general level. For example, Bakker and Bal (2010) found a positive effect of weekly work engagement on weekly performance, assessed as overall in-role and extra-role performance, among teachers, which we could not replicate. Furthermore, there is evidence that teachers' and pupils' perspectives differ regarding their performance indicators (Holzberger et al., 2013). Thus, including pupil-rated instructional quality could provide a more objective view of teacher performance.

## Practical implications

As our findings indicate predominantly positive effects of job crafting and work engagement, interventions for teachers should aim to stimulate both behaviors. Indeed, there is much evidence of the effectiveness of both job crafting and work engagement interventions. A meta-analysis emphasized that job crafting interventions are successful in promoting job crafting and, in addition, in fostering work engagement (Oprea et al., 2019). As job crafting intervention studies have already been conducted with teachers and have shown positive effects (e.g., van Wingerden et al., 2017), schools should offer such interventions to their teachers. Next, work engagement interventions aim to promote various drivers of work engagement and therefore differ substantially in their approaches. These include building personal and/or job resources, leadership training, and health promotion (Knight et al., 2017). Meta-analytical evidence has revealed a small but reliable effect of work engagement interventions in enhancing work engagement (e.g., Knight et al., 2017). In addition, previous findings have indicated that short interventions using soft skill trainings and positive psychology methods, including refreshing sessions after the intervention (Virga et al., 2021), as well as support by the leader, are essential for the success of these interventions (Knight et al., 2019). For example, principals should support teachers' participation in these interventions. Overall, teachers should be encouraged to adjust their job proactively. Although job crafting is a more self-initiated behavior, empirical evidence emphasizes its drivers of job crafting (see for a review; Zhang and Parker, 2019). This should also be applied to teachers' contexts.

## Conclusion

To conclude, the present study confirms the positive between-unit relationship between job crafting, work engagement, and performance among teachers. The relationships at the within-person level were more heterogeneous than expected. Although within weeks job crafting levels, work engagement, and performance were related to each other, the results across weeks showed inconsistent patterns. Despite the reciprocal relationship between work engagement and performance from one week to the next, the magnitude and direction of the relationship varied substantially. More consistently, our results indicate that teachers' weekly job crafting plays an important role as it predicts both work engagement and performance in the following week. We also demonstrate that job crafting levels in one week enhance work engagement in the following week, which further increases job crafting levels in the subsequent week, indicating that a cyclic relationship between both variables is triggered by job crafting among teachers.

## References

Adams, J. S. (1965). "Inequity in social exchange," in *Advances in Experimental Social Psychology*, Berkowitz, L. (ed.). Cambridge, MA: Academic Press, 267–299.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving human participants were reviewed and approved by Education Authorities of the Federal States in Germany. The participants provided their written informed consent to participate in this study.

## Author contributions

EL: conceptualization, methodology, formal analysis, investigations, writing—original draft, writing—review and editing, data curation, visualization, and software. MM: data curation, investigations, and writing—review and editing. DR: methodology, resources, and writing—review and editing. SN: conceptualization, resources, funding acquisition, and writing—review and editing. AH: conceptualization, resources, writing—review and editing, supervision, and funding acquisition. All authors contributed to the article and approved the submitted version.

## Funding

This study was developed in a project which was supported by the German Research Foundation (DFG), grant number: 385984253.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Baethge, A., Junker, N. M., and Rigotti, T. (2021). Does work engagement physiologically deplete? Results from a daily diary study. *Work Stress*. 35, 283–300. doi: 10.1080/02678373.2020.1857466

- Bakker, A. B., and Albrecht, S. (2018). Work engagement: current trends. *Career Dev. Int.* 23, 4–11. doi: 10.1108/CDI-11-2017-0207
- Bakker, A. B., and Bal, P. M. (2010). Weekly work engagement and performance: a study among starting teachers. *J. Occup. Organ. Psychol.* 83, 189–206. doi: 10.1348/096317909X402596
- Bakker, A. B., and Demerouti, E. (2007). The job demands-resources model: state of the art. *J. Manag. Psychol.* 22, 309–328. doi: 10.1108/02683940710733115
- Bakker, A. B., and Oerlemans, W. (2011). “Subjective well-being in organizations,” in *Handbook of Positive Organizational Scholarship*, Cameron, K., and Spreitzer, G. (eds.). Oxford: Oxford University Press, 178–189. doi: 10.1093/oxfordhb/9780199734610.013.0014
- Bakker, A. B., and Oerlemans, W. G. M. (2019). Daily job crafting and momentary work engagement: a self-determination and self-regulation perspective. *J. Vocat. Behav.* 112, 417–430. doi: 10.1016/j.jvb.2018.12.005
- Baumert, J., Blum, W., Brunner, M., Dubberke, T., Jordan, A., Klusmann, U., et al. (2009). *Professionswissen von Lehrkräften, kognitiv aktivierender Mathematikunterricht und die Entwicklung von mathematischer Kompetenz (COACTIV): Dokumentation der Erhebungsinstrumente*. Berlin: Max-Planck-Institut für Bildungsforschung.
- Beal, D. J., Weiss, H. M., Barros, E., and MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *J. Appl. Psychol.* 90, 1054–1068. doi: 10.1037/0021-9010.90.6.1054
- Belschak, F. D., and Den Hartog, D. N. (2009). Consequences of positive and negative feedback: the impact on emotions and extra-role behaviors. *Appl. Psychol.* 58, 274–303. doi: 10.1111/j.1464-0597.2008.00336.x
- Bindl, U. K., Unsworth, K. L., Gibson, C. B., and Stride, C. B. (2019). Job crafting revisited: implications of an extended framework for active changes at work. *J. Appl. Psychol.* 104, 605–628. doi: 10.1037/apl0000362
- Binnewies, C., Sonnentag, S., and Mojza, E. J. (2010). Recovery during the weekend and fluctuations in weekly job performance: a week-level study examining intra-individual relationships. *J. Occup. Organ. Psychol.* 83, 419–441. doi: 10.1348/096317909X418049
- Boehnlein, P., and Baum, M. (2022). Does job crafting always lead to employee wellbeing and performance? Meta-analytical evidence on the moderating role of societal culture. *Int. J. Human Res. Manage.* 33, 647–685. doi: 10.1080/09585192.2020.1737177
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Struct. Equ. Model.* 14, 464–504. doi: 10.1080/1070510701301834
- Christian, M. S., Garza, A. S., and Slaughter, J. E. (2011). Work engagement: a quantitative review and test of its relations with task and contextual performance. *Pers. Psychol.* 64, 89–136. doi: 10.1111/j.1744-6570.2010.01203.x
- Curran, P. G. (2016). Methods for the detection of carelessly invalid responses in survey data. *J. Exp. Soc. Psychol.* 66, 4–19. doi: 10.1016/j.jesp.2015.07.006
- de Bloom, J., Vaziri, H., Tay, L., and Kujanpää, M. (2020). An identity-based integrative needs model of crafting: Crafting within and across life domains. *J. Appl. Psychol.* 105, 1423–1446. doi: 10.1037/apl0000495
- de Jonge, J., and Dormann, C. (2006). Stressors, resources, and strain at work: a longitudinal test of the triple-match principle. *J. Appl. Psychol.* 91, 1359–1374. doi: 10.1037/0021-9010.91.5.1359
- Deci, E. L., and Ryan, R. M. (2000). The “what” and “why” of goal pursuits: human needs and the self-determination of behavior. *Psychol. Inq.* 11, 227–268. doi: 10.1207/S15327965PLI1104\_01
- Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J. Appl. Psychol.* 86, 499–512. doi: 10.1037/0021-9010.86.3.499
- Dicke, T., Stebner, F., Linninger, C., Kunter, M., and Leutner, D. (2018). A longitudinal study of teachers’ occupational well-being: applying the job demands-resources model. *J. Occup. Health Psychol.* 23, 262–277. doi: 10.1037/ocp0000070
- Dubbelt, L., Demerouti, E., and Rispens, S. (2019). The value of job crafting for work engagement, task performance, and career satisfaction: longitudinal and quasi-experimental evidence. *Eur. J. Work Organiz. Psychol.* 28, 300–314. doi: 10.1080/1359432X.2019.1576632
- Dunleavy, E. M., Barr, C. D., Glenn, D. M., and Miller, K. R. (2006). Effect size reporting in applied psychology: how are we doing. *Industrial-Organizational Psychol.* 43, 29–37. doi: 10.1037/e5791320.11-005
- Fisher, C. D., and Ashkanasy, N. M. (2000). The emerging role of emotions in work life: an introduction. *J. Organizat. Behav.* 123–129. doi: 10.1002/(SICI)1099-1379(200003)21:2<123::AID-JOB33>3.0.CO;2-8
- Fredrickson, B. L. (1998). What good are positive emotions? *Rev. General Psychol.* 2, 300–319. doi: 10.1037/1089-2680.2.3.300
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: the broaden-and-build theory of positive emotions. *Am. Psychol.* 56, 218–226. doi: 10.1037/0003-066X.56.3.218
- Funder, D. C., and Ozer, D. J. (2019). Evaluating Effect Size in Psychological Research: Sense and Nonsense. *Advances in Methods and Practices in Psychological Science* 2, 156–168. doi: 10.1177/2515245919847202
- Geldenhuis, M., Bakker, A. B., and Demerouti, E. (2021). How task, relational and cognitive crafting relate to job performance: a weekly diary study on the role of meaningfulness. *Eur. J. Work. Organ. Psychol.* 30, 83–94. doi: 10.1080/1359432X.2020.1825378
- Gemmano, C. G., Signore, F., Caffò, A. O., Palmisano, G. L., Bosco, A., and Manuti, A. (2020). What a difference a workplace makes. A scientometric analysis on the relationship between job crafting and healthy organizations’ factors. *Electron. J. Appl. Stat. Anal.* 13, 652–681. doi: 10.1285/i20705948v13n3p652
- Ghitulescu, B. E. (2007). *Shaping Tasks and Relationships at Work: Examining the Antecedents and Consequences of Employee Job Crafting*. Pittsburgh: University of Pittsburgh.
- Guan, X., and Frenkel, S. (2018). How HR practice, work engagement and job crafting influence employee performance. *Chin. Manage. Stud.* 12, 591–607. doi: 10.1108/CMS-11-2017-0328
- Hakanen, J. J., Peeters, M. C. W., and Schaufeli, W. B. (2018). Different types of employee well-being across time and their relationships with job crafting. *J. Occup. Health Psychol.* 23, 289–301. doi: 10.1037/ocp0000081
- Halbesleben, J. R. B., and Wheeler, A. R. (2015). To invest or not? The role of coworker support and trust in daily reciprocal gain spirals of helping behavior. *J. Manage.* 41, 1628–1650. doi: 10.1177/0149206312455246
- Hamaker, E. L., Kuiper, R. M., and Grasman, R. P. (2015). A critique of the cross-lagged panel model. *Psychol. Methods* 20, 102–116. doi: 10.1037/a0038889
- Harju, L. K., Hakanen, J. J., and Schaufeli, W. B. (2016). Can job crafting reduce job boredom and increase work engagement? A three-year cross-lagged panel study. *J. Vocational Behav.* 95–96, 11–20. doi: 10.1016/j.jvb.2016.07.001
- Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066X.44.3.513
- Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: advancing conservation of resources theory. *Appl. Psychol.* 50, 337–370. doi: 10.1111/1464-0597.00062
- Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Rev. General Psychol.* 6, 307–324. doi: 10.1037/1089-2680.6.4.307
- Holzberger, D., Philipp, A., and Kunter, M. (2013). How teachers’ self-efficacy is related to instructional quality: a longitudinal analysis. *J. Educ. Psychol.* 105, 774–786. doi: 10.1037/a0032198
- Hu, X., and Kaplan, S. (2015). Is “feeling good” good enough? Differentiating discrete positive emotions at work. *J. Organizat. Behav.* 36, 39–58. doi: 10.1002/job.1941
- Knight, C., Patterson, M., and Dawson, J. (2017). Building work engagement: A systematic review and meta-analysis investigating the effectiveness of work engagement interventions. *J. Organ. Behav.* 38, 792–812. doi: 10.1002/job.2167
- Knight, C., Patterson, M., and Dawson, J. (2019). Work engagement interventions can be effective: a systematic review. *Eur. J. Work Organizat. Psychol.* 28, 348–372. doi: 10.1080/1359432X.2019.1588887
- Kooij, D. T. A. M., Nijssen, H., Bal, P. M., and van der Kruijssen, D. T. F. (2020). Crafting an interesting job: stimulating an active role of older workers in enhancing their daily work engagement and job performance. *Work, Aging and Retirement* 6, 165–174. doi: 10.1093/workar/waaa001
- Kunter, M., and Baumert, J. (2006). Who is the expert? Construct and criteria validity of student and teacher ratings of instruction. *Learn. Environ. Res.* 9, 231–251. doi: 10.1007/s10984-006-9015-7
- Laguna, M., and Rasmus, W. (2019). When I feel my business succeeds, I flourish: reciprocal relationships between positive orientation, work engagement, and entrepreneurial success. *J. Happiness Stud.* 20, 2711–2731. doi: 10.1007/s10902-018-0065-1
- Leana, C., Appelbaum, E., and Shevchuk, I. (2009). Work process and quality of care in early childhood education: the role of job crafting. *Acad. Manage. J.* 52, 1169–1192. doi: 10.5465/amj.2009.47084651
- Lee, J. Y., and Lee, Y. (2018). Job crafting and performance: literature review and implications for human resource development. *Hum. Resour. Dev. Rev.* 17, 277–313. doi: 10.1177/1534484318788269
- Lichtenthaler, P. W., and Fischbach, A. (2019). A meta-analysis on promotion- and prevention-focused job crafting. *Eur. J. Work Organizat. Psychol.* 28, 30–50. doi: 10.1080/1359432X.2018.1527767
- Lindsley, D. H., Brass, D. J., and Thomas, J. B. (1995). Efficacy-performance spirals: A multilevel perspective. *Acad. Manage. Rev.* 20, 645–678. doi: 10.2307/258790
- Lu, C., Wang, H., Lu, J., Du, D., and Bakker, A. B. (2014). Does work engagement increase person-job fit? The role of job crafting and job insecurity. *J. Vocational Behav.* 84, 142–152. doi: 10.1016/j.jvb.2013.12.004
- Marsh, H. W., Hau, K.-T., and Grayson, D. (2005). “Goodness of fit in structural equation models,” in *Contemporary Psychometrics: A festschrift for Roderick P.*

- McDonald, Maydeu-Olivares, A., and McArdle, J. J. (eds.). Mahwah: Lawrence Erlbaum Associates Publishers, 275–340.
- Mulder, J. D., and Hamaker, E. L. (2021). Three extensions of the random intercept cross-lagged panel model. *Struct. Equat. Model.* 18, 1–11. doi: 10.1080/10705511.2020.1784738
- Neuber, L., Englitz, C., Schulte, N., Forthmann, B., and Holling, H. (2022). How work engagement relates to performance and absenteeism: a meta-analysis. *Eur. J. Work Organizat. Psychol.* 31, 292–315. doi: 10.1080/1359432X.2021.1953989
- Oprea, B. T., Barzin, L., Virga, D., Iliescu, D., and Rusu, A. (2019). Effectiveness of job crafting interventions: A meta-analysis and utility analysis. *Eur. J. Work Organizat. Psychol.* 28, 723–741. doi: 10.1080/1359432X.2019.1646728
- Orth, U., Meier, L. L., Bühler, J. L., Dapp, L. C., Krauss, S., Messerli, D., et al. (2022). Effect size guidelines for cross-lagged effects. *Psychol. Methods.* doi: 10.1037/met0000499
- Petrou, P., Bakker, A. B., and Heuvel, M., van den. (2017). Weekly job crafting and leisure crafting: implications for meaning-making and work engagement. *J. Occup. Organ. Psychol.* 90, 129–152. doi: 10.1111/joop.12160
- Petrou, P., Demerouti, E., Peeters, M. C. W., Schaufeli, W. B., and Hetland, J. (2012). Crafting a job on a daily basis: contextual correlates and the link to work engagement. *J. Organ. Behav.* 33, 1120–1141. doi: 10.1002/job.1783
- Reis, D., Arndt, C., Lischetzke, T., and Hoppe, A. (2016). State work engagement and state affect: similar yet distinct concepts. *J. Vocat. Behav.* 93, 1–10. doi: 10.1016/j.jvb.2015.12.004
- Rogala, A., and Cieslak, R. (2019). Positive emotions at work and job crafting: results from two prospective studies. *Front. Psychol.* 10, 2786. doi: 10.3389/fpsyg.2019.02786
- Rossee, Y. (2015). *Package "lavaan": Latent Variable Analysis*. Comprehensive R Archive Network (CRAN).
- RStudio Team (2021). *RStudio: Integrated Development for R (1.1.456)*. Boston: RStudio Inc.
- Rudolph, C. W., Katz, I. M., Lavigne, K. N., and Zacher, H. (2017). Job crafting: A meta-analysis of relationships with individual differences, job characteristics, and work outcomes. *J. Vocat. Behav.* 102, 112–138. doi: 10.1016/j.jvb.2017.05.008
- Salanova, M., Llorens, S., and Schaufeli, W. B. (2011). "Yes, I can, I feel good, and I just do it!" On gain cycles and spirals of efficacy beliefs, affect, and engagement. *Appl. Psychol.* 60, 255–285. doi: 10.1111/j.1464-0597.2010.00435.x
- Schachler, V., Eppe, S. D., Clauss, E., Hoppe, A., Slemp, G. R., and Ziegler, M. (2019). Measuring job crafting across cultures: lessons learned from comparing a german and an australian sample. *Front. Psychol.* 10, 991. doi: 10.3389/fpsyg.2019.00991
- Schaufeli, W. B., and Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J. Organ. Behav.* 25, 293–315. doi: 10.1002/job.248
- Schaufeli, W. B., Bakker, A. B., and Salanova, M. (2006). The measurement of work engagement with a short questionnaire: a cross-national study. *Educ. Psychol. Meas.* 66, 701–716. doi: 10.1177/0013164405282471
- Schaufeli, W. B., and Salanova, M. (2008). "Enhancing work engagement through the management of human resources," in *The Individual in the Changing Working Life*, Näswall, K., Hellgren, J., and Sverke, M. (eds.). Cambridge: Cambridge University Press, 380–402. doi: 10.1017/CBO9780511490064.018
- Schaufeli, W. B., Salanova, M., González-Romá, V., and Bakker, A. B. (2002). The measurement of engagement and burnout: a two sample confirmatory factor analytic approach. *J. Happiness Stud.* 3, 71–92. doi: 10.1023/A:1015630930326
- Schaufeli, W. B., and Taris, T. W. (2014). "A critical review of the job demands-resources model: implications for improving work and health," in *Bridging Occupational, Organizational and Public Health: A Transdisciplinary Approach*, Bauer, G. F., Hämmig, O., Bauer, G. F., and Hämmig, O. (eds.). Berlin: Springer Science + Business Media, 43–68. doi: 10.1007/978-94-007-5640-3\_4
- Slemp, G. R., and Vella-Brodrick, D. A. (2013). The job crafting questionnaire: a new scale to measure the extent to which employees engage in job crafting. *Int. J. Wellbeing.* 3, 126–146. doi: 10.1037/t74913-000
- Slemp, G. R., and Vella-Brodrick, D. A. (2014). Optimising employee mental health: The relationship between intrinsic need satisfaction, job crafting, and employee well-being. *J. Happiness Stud.* 15, 957–977. doi: 10.1007/s10902-013-9458-3
- Solberg, E., and Wong, S. I. (2016). Crafting one's job to take charge of role overload: when proactivity requires adaptivity across levels. *Leadersh. Q.* 27, 713–725. doi: 10.1016/j.leaqua.2016.03.001
- Sonnentag, S. (2011). Research on work engagement is well and alive. *Eur. J. Work Organizat. Psychol.* 20, 29–38. doi: 10.1080/1359432X.2010.510639
- Sonnentag, S., Binnewies, C., and Mojza, E. J. (2010a). Staying well and engaged when demands are high: the role of psychological detachment. *J. Appl. Psychol.* 95, 965–976. doi: 10.1037/a0020032
- Sonnentag, S., Dormann, C., and Demerouti, E. (2010b). "Not all days are created equal: The concept of state work engagement," in *Work Engagement: A Handbook of Essential Theory and Research*, Bakker, A. B., and Leiter, M. P. (eds.). London: Psychology Press, 25–38.
- Sørlie, H. O., Hetland, J., Bakker, A. B., Espevik, R., and Olsen, O. K. (2022). Daily autonomy and job performance: does person-organization fit act as a key resource? *J. Vocat. Behav.* 133, 103691. doi: 10.1016/j.jvb.2022.103691
- Sullivan, G. M., and Feinn, R. (2012). Using effect size—or why the p value is not enough. *J. Grad. Med. Educ.* 4, 279–282. doi: 10.4300/JGME-D-12-00156.1
- Tims, M., and Bakker, A. B. (2010). Job crafting: towards a new model of individual job redesign. *SA J. Industrial Psychol.* 36, 1–9. doi: 10.4102/sajip.v36i2.841
- Tims, M., Bakker, A. B., and Derks, D. (2012). Development and validation of the job crafting scale. *J. Vocat. Behav.* 80, 173–186. doi: 10.1016/j.jvb.2011.05.009
- Tims, M., Bakker, A. B., and Derks, D. (2014). Daily job crafting and the self-efficacy—performance relationship. *J. Manag. Psychol.* 29, 490–507. doi: 10.1108/JMP-05-2012-0148
- Tims, M., Bakker, A. B., Derks, D., and Rhenen, W., van. (2013). Job crafting at the team and individual level: implications for work engagement and performance. *Group & Organization Management* 38, 427–454. doi: 10.1177/1059601113492421
- Tisu, L., Rusu, A., Sulea, C., and Virg,ă, D. (2022). Job resources and strengths use in relation to employee performance: a contextualized view. *Psychol. Rep.* 125, 1494–1527. doi: 10.1177/0033294121997783
- Vakola, M., Petrou, P., and Katsaros, K. (2020). Work engagement and job crafting as conditions of ambivalent employees' adaptation to organizational change. *J. Appl. Behav. Sci.* 57, 57–79. doi: 10.1177/0021886320967173
- Van Horn, J. E., Schaufeli, W. B., and Taris, T. W. (2001). Lack of reciprocity among Dutch teachers: validation of reciprocity indices and their relation to stress and well-being. *Work Stress* 15, 191–213. doi: 10.1080/02678370110066571
- van Wingerden, J., Bakker, A. B., and Derks, D. (2017). Fostering employee wellbeing via a job crafting intervention. *J. Vocat. Behav.* 100, 164–174. doi: 10.1016/j.jvb.2017.03.008
- Virga, D., Maricutoiu, L. P., and Iancu, A. (2021). The efficacy of work engagement interventions: a meta-analysis of controlled trials. *Curr. Psychol.* 40, 5863–5880. doi: 10.1007/s12144-019-00438-z
- Viswesvaran, C., and Ones, D. S. (2000). Perspectives on models of job performance. *Int. J. Select. Assessm.* 8, 216–226. doi: 10.1111/1468-2389.00151
- Vogt, K., Hakanen, J. J., Brauchli, R., Jenny, G. J., and Bauer, G. F. (2016). The consequences of job crafting: a three-wave study. *Eur. J. Work Organizat. Psychol.* 25, 353–362. doi: 10.1080/1359432X.2015.1072170
- Wang, Y., and Lau, D. C. (2021). How and why job crafting influences creative performance? A resource allocation explanation of the curvilinear moderated relations. *Asia Pacific J. Manage.* 1–27. doi: 10.1007/s10490-021-09773-x
- Watson, G. P., and Sinclair, R. R. (2022). Getting crafty: examining social resource crafting's relationship with work engagement and social support. *Stress Health.* doi: 10.1002/smi.3207
- Weinert, F. E., Schrader, F.-W., and Helmke, A. (1989). Quality of instruction and achievement outcomes. *Int. J. Educ. Res.* 13, 895–914. doi: 10.1016/0883-0355(89)90072-4
- Weseler, D., and Niessen, C. (2016). How job crafting relates to task performance. *J. Manag. Psychol.* 31, 672–685. doi: 10.1108/JMP-09-2014-0269
- Wrzesniewski, A., and Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Acad. Manage. Rev.* 26, 179–201. doi: 10.2307/259118
- Xanthopoulou, D., Bakker, A. B., Demerouti, E., and Schaufeli, W. B. (2009). Reciprocal relationships between job resources, personal resources, and work engagement. *J. Vocat. Behav.* 74, 235–244. doi: 10.1016/j.jvb.2008.11.003
- Xie, F., and Derakhshan, A. (2021). A conceptual review of positive teacher interpersonal communication behaviors in the instructional context. *Front. Psychol.* 12, 708490. doi: 10.3389/fpsyg.2021.708490
- Zampetakis, L. A. (2023). Employees' fear at work, job crafting, and work engagement on a daily basis: the case for fear of COVID-19. *Appl. Psychol.* 72, 535–558. doi: 10.1111/apps.12388
- Zhang, F., and Parker, S. K. (2019). Reorienting job crafting research: a hierarchical structure of job crafting concepts and integrative review. *J. Organ. Behav.* 40, 126–146. doi: 10.1002/job.2332