To what extent do perceptions of psychological contract breach and fulfillment fluctuate over time: Exploring temporal changes in obligated and delivered inducements

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To what extent do perceptions of psychological contract breach and fulfilment fluctuate over time: Exploring temporal changes in obligated and delivered inducements

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Abstract

The psychological contract (PC) is a dynamic process, where employees actively and passively adjust their perceptions of obligated and delivered inducements. Although employees experience PC breach (both over- and under-fulfilment) regularly, we still lack a comprehensive understanding of the driving forces underlying these temporal dynamics. We introduce a dynamic systems perspective to understand these temporal fluctuations. We show that perceptions of obligated and delivered inducements interact with each other and drive the temporal dynamics of PC breach and fulfilment. We examined 26 common inducements and found that the perceptions of the extent to which all the inducements are obligated and delivered fluctuate over time. We compared daily and weekly time-frames and found that the daily frame maximizes the temporal fluctuations of obligated and delivered inducements, whereas the weekly frame captures more complex trajectories. Furthermore, inducements that are explicitly communicated demonstrate more temporal fluctuations than inducements that are not explicitly communicated. We advance PC theory by showing that breach and fulfilment fluctuations are driven by changes in the level to which inducements are obligated and delivered. We provide practical guidelines for the choice of an ideal time-frame to study perceptions of PC breach and fulfilment, depending on the specific inducements and the aim of the research. We propose that researchers further integrate dynamic systems theory into PC models.

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Introduction

Like many workplace phenomena, the psychological contract (PC) —which describes an employee's perception of the mutual obligations between her- or himself and an employer—is dynamic (Griep, Vantilborgh, Hansen, & Conway, 2018) and is formed, renegotiated, and abandoned over time (Rousseau, Hansen, & Tomprou, 2018). Perceptions of PC breach emerge over time, as employees process information through feedback loops regarding the discrepancy between what their employer owes them and what they actually receive (Lambert, Edwards, & Cable, 2003). Employees experience PC breaches regularly, with evidence suggesting that there are monthly (Robinson & Rousseau, 1994), weekly (Vantilborgh, Bidee, Pepermans, Griep, & Hofmans, 2016), and even daily (Conway & Briner, 2002) fluctuations. Despite recent theoretical and empirical studies focusing on temporal dynamic processes in the PC (e.g., Achnak, Griep, & Vantilborgh, 2018; Griep et al., 2018; Rousseau et al., 2018), we lack a comprehensive understanding of the forces driving the temporal dynamics in breach and fulfilment perceptions. In particular, it remains unclear (a) why perceptions of breach and fulfilment fluctuate over time, (b) how rapidly these perceptions fluctuate and, hence, what time-frames are ideal to study these fluctuations, and (c) which inducements are more or less likely to fluctuate over time.

Understanding how temporal fluctuations of the obligated and delivered levels of individual inducements help to form general PC breach perceptions would substantially advance our temporal understanding of PC theory. In this paper, we will integrate Dynamic Systems

Theory and Control Theory into PC Theory. Specifically, we draw on the expanded view of PC breach (Lambert et al., 2003) to examine how feedback loops at the inducement level drive fluctuations of obligated and delivered inducements. Both the expanded view of PC breach and Dynamic Systems Theory principles center on the comparison between obligated and delivered levels of inducements. Through feedback loops, these comparisons drive the changes in the perceptions of obligated and delivered inducements, and these changes further integrate into general perceptions of PC breach. From a temporal perspective, the fluctuations of obligated and delivered inducements perpetuate each other and form a dynamic self-organizing system (Wang, Zhou, & Zhang, 2016).

Moreover, knowing how rapidly perceptions of breach and fulfilment fluctuate over time would both advance PC theory as well as offer practical guidelines to researchers on PC dynamics. To date, there is no consensus in the literature regarding the time-frame over which perceptions of breach and fulfilment fluctuate (Griep et al., 2018), as exemplified by the wide variety of time-frames used in empirical studies, ranging from multiple observations per day, over daily, to weekly, and even longer time-frames. In the current study, we examine which of the two most commonly used time-frames in PC research—daily and weekly time-frames—is ideal to capture short-term within-person temporal variations (McCormick, Reeves, Downes, Li, & Ilies, 2018).

We acknowledge that the PC consists of multiple obligations (i.e., employer inducements and employee contributions) that are exchanged between two parties, and temporal dynamics may differ depending on the nature of the obligation. For example, breach and fulfilment perceptions of an inducement such as recognition may be more prone to fluctuations than pay. To better understand these differential temporal dynamics, we move away from global measures

of breach and fulfilment and instead focus on fluctuations of 26 common employer inducements (Kickul, Lester, & Finkl, 2002). Moreover, we theorize and test that these differential temporal dynamics can be explained by whether they were explicitly or implicitly communicated to the employee.

In sum, by studying the temporal dynamics of PC breach and fulfilment, we will make three major contributions to the literature. First, we will advance PC theory by examining whether fluctuations in breach and fulfilment occur due to changes in the level to which inducements are obligated or delivered. We will show that changes in obligated and delivered inducements are coupled to each other over time, introducing a dynamic systems perspective to the PC literature. Second, we will assess if fluctuations in obligated and delivered inducements are best studied using a daily or weekly time-frame, thus providing practical guidelines. We will show that choosing an ideal time-frame is not straightforward and depends on the nature of the inducement and aim of the research. Third, we will broaden our understanding of the temporal dynamics in breach and fulfilment perceptions by focusing on individual inducements rather than on global perceptions. We thus demonstrate that there is considerable heterogeneity in these temporal dynamics which may be overlooked by using aggregate global measures.

Traditional PC theory

Rousseau's (1989) definition of the PC has been instrumental in PC research for the past three decades. Rousseau defined the PC as an employee's perceptions of mutual obligations between her- or himself and an employer, highlighting the subjective and idiosyncratic nature of the PC. The element of mutuality implies that both parties are in an exchange relationship, governed by the norm of reciprocity (Gouldner, 1960), in which employees offer contributions in return for inducements from the employer. The focus lies on obligations—rather than

expectations or promises—and these can arise from various sources. Some obligations may be explicitly communicated between both parties; a manager may, for example, explicitly state during a job interview that the employee can expect to receive a pay raise after one year. Other obligations are inferred implicitly; for example, by observing organizational citizenship behaviors of coworkers one may infer to also be obligated to engage in these behaviors. In sum, the PC forms a mental schema that employees use to monitor their exchange agreement and that guides their day-to-day behaviors (Rousseau, 2001).

PC breach as a dynamic process

The PC was originally proposed to be an ongoing dynamic process (Levinson, Price, Munden, Mandl, & Solley, 1962), but it is only in recent years that scholars have begun to explicitly incorporate temporal dynamics into PC Theory. We build on the recent dynamic phase model of PC processes (Rousseau et al., 2018) and integrate the feedback mechanism of Control Theory (Carver & Scheier, 2002). We also point out the common mechanism underlying the dynamic phase model of PC, Dynamic Systems Theory and Control Theory—the function of feedback loops in the self-organizing system of breach perception formations that stem from employees' goals (Carver & Scheier, 2002).

The dynamic phase model builds on self-regulation mechanisms that center on individual's goals and feedbacks regarding goal process (Rousseau et al., 2018). The dynamic phase model specifies that employees' PCs go through various phases over time, each with their own dynamics. In this study, we zoom in on the dynamics within the maintenance phase and try to disentangle how the reciprocity between obligated and delivered inducements help to shape the temporal fluctuations of PC breach perceptions. During maintenance, the PC is stable yet also dynamic (Rousseau et al., 2018). Specifically, employees make minor updates to their PC

through assimilation that requires little cognitive effort, without experiencing large disturbances (Rousseau et al., 2018). Moreover, changes in employees' goals can trigger a series of changes in the perceptions of obligated (i.e., drift in Rousseau, 1995) and delivered inducements (i.e., environmental cues), thus feeding information to form breach perception. However, only large discrepancies are perceived as breaches, whereas minor discrepancies are integrated into the PC, without the employee leaving the maintenance phase (Rousseau et al., 2018).

Control Theory provides a process framework regarding how feedback loops contribute to the detection of discrepancies between a goal and an environmental cue (Carver & Scheier, 2002). Feedback control pushes the reciprocity between obligated and delivered inducements forward (Carver & Scheier, 2002; see Figure 1). According to Control Theory, feedback loops are the fundamental building blocks of actions (Klein, 1989). In a simple form, a feedback loop consists of four elements: a goal (a reference point towards which one wishes to move), input function (one's location on a variable), comparator (comparison between input and goal), and output function (making changes to reduce the distance between present location and goal; Carver & Scheier, 2002; Klein, 1989). In the PC process, employees form perceptions of what the employer owes them mainly based on their goals, and these perceptions change as a function of the contributions they have made and the inducements they have received over time (De Vos, Buyens, & Schalk, 2003). If there is a discrepancy, usually a negative feedback loop (discrepancy-reducing) will be activated, meaning that employees eventually adjust their perception of obligated inducements to reduce its gap with delivered inducements. In case of a negative discrepancy, employees may decrease contributions to reciprocate lower inducements (Gouldner, 1960). The decrease in employee contributions will in turn result in a decrease in employer inducements, which factually diminishes the gap between obligated and delivered

inducements. However, a decrease in employee contributions can also directly lead to a decrease in perceived obligated inducements due to the norm of reciprocity (Rousseau et al., 2018).

INSERT FIGURE 1 ABOUT HERE

The dynamic feedback loops in Control Theory align with Dynamic Systems Theory. In particular, goals resemble *attractors* in the sense that they both exert a metaphorical pull on the system, meaning that they steer actions towards the attainment of a particular outcome while resisting other possibilities (Vallacher, Coleman, Nowak, & Bui-Wrzosinska, 2010). An attractor in the PC is characterized by two characteristics: the range of discrepancies between obligated and delivered inducements (attractor basin) and its resistance to change (attractor strength; Vantilborgh, 2018). A PC evaluation can be one of various attractor states, representing an equilibrium that requires minimum energy to maintain (Vallacher et al., 2010), such as an under-fulfilment (i.e., receiving less than obligated), fulfilment, or over-fulfilment (i.e., receiving more than obligated) attractor. Once the comparator detects a discrepancy that is large enough, employees are pulled out of their current attractor state (e.g., fulfilment) and will move towards another attractor state (e.g., under-fulfilment).

PC evaluations are essentially self-regulatory processes because the comparisons between obligated and delivered levels of individual inducements happen automatically, through discrepancy feedback mechanisms that operate with minimal cognitive effort (Carver & Scheier, 2002; Rousseau et al., 2018). Comparisons are performed for each inducement separately, and these comparisons across inducements aggregate into global perceptions of breach and fulfilment, with employees weighing the inducements based on factors such as the value of each inducement (Lambert, 2011). The formation of global breach perceptions from the micro level individual inducement discrepancy feedback mechanisms resembles a bottom-up self-organizing

system, whereas individuals' goals drive the top-down control. These two modes provide two sources of automaticity (Carver & Scheier, 2002). Employees monitor their goal attainment, automatically comparing obligated and delivered levels of inducements. Given enough repetition, this act also becomes automatic (Carver & Scheier, 2002). During maintenance, a variety of assimilation mechanisms create low-effort change in the PC (Rousseau et al., 2018). Furthermore, employees passively integrate new information into their PC, without intentionally changing the current PC (Rousseau et al., 2018).

Although the most commonly used measures—global and facet measures of breach—appear to be distinct conceptualizations of the same phenomenon, they can be integrated when one considers the emergence of breach perceptions as a dynamic self-regulatory or control process. Global measures capture aggregate perceptions of breach. These measures acknowledge the comparison between obligated and delivered inducements, but do not specify how this information is integrated. In addition, global measures acknowledge that a host of other factors may influence the evaluation of breach, such as heuristics and affect (Vantilborgh, Bidee, Pepermans, Griep, & Hofmans, 2016). With this approach, respondents are usually required to provide an overall evaluation of the state of their PC, thereby mentally aggregating all influential factors across inducements. In contrast, facet measures focus on individual inducements. An example of this is the expanded view approach, which considers breach and fulfilment to be distinct phenomena that can be studied by explicitly comparing levels of obligated and delivered inducements (Lambert et al., 2003). As a result, both deficiency and excess are considered forms of breach. With this approach, breach and fulfilment are measured by asking respondents to provide separate ratings of the extent to which distinct inducements are obligated and delivered.

In sum, the dynamic phase model, Control Theory and Dynamic Systems Theory all share the same key elements—the central role of goals and feedback loops. Building on these characteristics, we assume that temporal dynamics of breach and fulfilment can be best understood by looking at how feedback loops maneuver small discrepancies between obligated and delivered inducements. We focus on the maintenance phase because this phase allows capturing passive changes driven by feedback loops and active changes caused by changes in goals, without requiring changes in attractor states.

Changes in the extent to which inducements are obligated

The dynamic phase model and Dynamic Systems Theory state that during the maintenance phase, the PC operates implicitly in the background of employees' minds, requiring little effort (Rousseau et al., 2018). Beliefs about employer obligations can drift due to changes in the employee's goals. According to adaptation-level theory, individuals judge experiences relatively to a reference point that shifts with past experiences and current stimuli and make adaptations very quickly (Judge, Piccolo, Podsakoff, Shaw, & Rich, 2010). For example, an employee that recently got promoted will aim for higher levels of inducements pertaining autonomy (i.e., increased adaptation level), and future delivered inducements will be compared to the updated adaptation-level. Moreover, employees may perceive continuing to work for their employer as a contribution in itself and thus increase their perceived entitlement (Robinson, Kraatz, & Rousseau, 1994). Put differently, employees see their continued association with the employer as a surplus to unchanged employer inducements. As a result, employees may perceive increasing levels of employer obligations over time.

Hypothesis 1: There will be a linear increase in the extent that inducements are obligated over time.

Changes in the extent to which inducements are delivered

Perceptions of delivered inducements are likely to fluctuate over time in complex non-linear patterns. The reason for this is that various factors shape perceptions of delivered inducements; the most obvious factor being the actual delivery of inducements by the employer. Employers may decide to increase or decrease the amount of an inducement, knowing that these changes may lead to breach perceptions, a situation that is called reneging (Morrison & Robinson, 1997). For example, an employer may decide to deliver less of an inducement due to changes in external factors, such as a sudden economic downturn, or due to internal factors such as an impending reorganization. Moreover, employers may decide to offer different levels of an inducement as a management tool, for example to reward an employee for high sales numbers. Employee perceptions of what the employer delivers can also fluctuate due to intra-individual factors. For example, Vantilborgh and colleagues (2016) showed that people use affect as a heuristic to evaluate the state of their PC. This means that perceptions of what is being delivered may covary with how employees feel at work, even when the actual level of delivered inducements remains constant. The variety of factors influencing perceptions of delivered inducements and the apparent randomness of certain factors may obfuscate clear patterns in delivered inducement perceptions. We therefore do not formulate an explicit hypothesis and instead explore how the perceptions of delivered inducements evolve over time.

Research Question 1: How do perceptions of delivered inducements change over time?

Reciprocity in the extents to which inducements are obligated and delivered

According to Control Theory, obligated and delivered inducements are both essential elements of a feedback loop. A discrepancy between delivered inducements and employees' goals may lead to an update in the perception of obligated inducements. A small discrepancy

may not be seen as a breach, but employees nevertheless adjust their perception of mutual obligations to reduce the gap between their goals and the input (Carver & Scheier, 2002; Rousseau et al., 2018). Only when discrepancies are large enough will employees experience a disruption, pulling them out of the fulfilment attractor state and into an under-fulfilment state (negative discrepancy) or over-fulfilment state (positive discrepancy; Vantilborgh, 2018). To reduce the gap between obligated and delivered inducements, employees will increase the level of obligated obligations in case of positive discrepancies and decrease the level of obligated inducements in case of negative discrepancies. For example, an employee receives an over-fulfilment of career mentoring one day and believes that the organization appreciates his/her potential. This new experience will be integrated into the PC and cause an upward shift in the employee's adaptation-level (Bowling, Beehr, Wagner, & Libkuman, 2005). The employee will view the over-fulfilment as a new reference point and perceive increased obligated inducements. Therefore, we predict that changes in delivered inducements will positively relate to subsequent changes in obligated inducements.

Hypothesis 2: Changes in the extent to which inducements are delivered positively predict subsequent changes in the extent to which inducements are obligated.

Similarly, changes in perceptions of obligated inducements may result in changes in the perceptions of delivered inducements for two reasons. First, employees may adjust their perceptions of what the employer owes them prior to negotiating a better deal (Rousseau, Ho, & Greenberg, 2006). For example, observing coworkers receive a pay raise may lead to an update of one's referent. To reduce the gap between the referent and delivered inducements, the employee may decide to negotiate a better deal, actively trying to change the level of delivered inducements. Second, employees who believe the organization owes them more or less than

before may reciprocate by altering their own contributions accordingly. For example, during an organizational crisis, one may have decreased expectations of job security in fear of losing one's job (Conway, Kiefer, Hartley, & Briner, 2014). The employee may increase his/her contribution in the hope that the organization will reciprocate by increasing the level of delivered job security. When the employee, for example, engages in more extra-role behavior, the organization may notice this change and change the level of delivered inducements. In sum, we predict that:
Hypothesis 3: Changes in the extent to which inducements are obligated positively predict subsequent changes in the extent to which inducements are delivered.

Rate of change

It remains unclear to what extent obligated and delivered inducements fluctuate over time and which factors influence these fluctuations. Establishing the rate of change of a phenomenon is a crucial first step towards understanding its dynamic features (Roe, 2008). Dynamic phenomena have an onset, offset, and duration (Mitchell & James, 2001). In addition, certain inducements may fluctuate rapidly whereas others remain stable over time. Obtaining knowledge on rates of change matters to scholars aiming to study PC breach as a dynamic phenomenon because a rapid rate of change requires a high-density measurement design with short time-lags whereas a slow rate requires a more traditional longitudinal design with longer time-lags. Lacking such knowledge, researchers tend to select time-lags for practical reasons (for a critique see Dormann & Van de Ven, 2014). In the PC literature, studies have used daily (Conway & Briner, 2002), weekly (Vantilborgh et al., 2016), monthly (Buch, Kuvaas, Shore, & Dysvik, 2014), tri-monthly (Kiewitz, Restubog, Zagenczyk, & Hochwarter, 2009), or even yearly time-lags (Bal, De Cooman, & Mol, 2013). However, we still do not know the best design to capture within-person variability (WPV).

Research from various domains shows that shorter time-intervals, compared with longer time-intervals, are better at capturing WPV. Bolger and colleagues (2003) noted that lengthening the intervals between survey measurements increases retrospective bias and reduces the fidelity to capture WPV, thus resulting in more stable and average levels of constructs. Robinson and Clore (2002) argue that longer time-intervals provide more room for mental aggregation, driven by factors such as personality and general knowledge rather than by episodic memory. Beal (2015) also argued that mental aggregation is expected to increase as the time-interval increases. Therefore, shorter periods of time are better at capturing what actually happened as opposed to what typically happens or what might be expected to happen (Beal, 2015). In line with this, McCormick and colleagues (2018) meta-analytically demonstrated that shorter time-intervals capture more WPV. Given that there is limited theory guiding the choice of time-frames in PC research, we depart from the two most commonly used time intervals (daily and weekly) and empirically contrast the effects of these two time-frames on WPV. As explained above, we expect that there will be more WPV in perceptions of obligated and delivered inducements when using the daily time-frame because the weekly time-frame allows respondents to aggregate information on the state of their PC.

Hypothesis 4: There will be more WPV in obligated and delivered inducements when using daily compared to weekly time-frames.

The rate of change might be different for perceptions of obligated and delivered inducements. Extending earlier arguments, changes in perceptions of obligated inducements are gradual or adjusted to changes in delivered inducements. In contrast, changes in perceptions of delivered inducements are less predictable because they are driven by a large variety of extra-organizational, intra-organizational, and intra-individual factors. Consequently, we predict that

there will be more within-person fluctuations in perceptions of delivered than obligated inducements. This also aligns with earlier research showing that delivered inducements, compared to obligated inducements, receive more attention from employees and are more strongly related to job satisfaction and feelings of violation (Montes & Irving, 2008). Employees may therefore pay more attention to what is being delivered than to what was believed to be obligated, resulting in a higher likelihood that perceptions of deliveries fluctuate more over time.

Hypothesis 5: There will be more WPV in delivered than in obligated inducements.

Temporal dynamics of PC breach and fulfilment may be contingent on the type of inducement being evaluated, with some inducements more prone to fluctuations than others. We argue that the extent to which cues about obligations are implicit versus explicit may explain such differences. Whether obligations are communicated implicitly or explicitly can be considered a characteristic element of PCs (Conway & Briner, 2009). In fact, the inclusion of implicit obligations differentiates PC from legal contracts. Implicit obligations are formed when employees make inferences about obligations based on past patterns of exchange, witnessing other employees' experiences, pre-employment experiences, or personal needs and desires (Conway & Briner, 2009). These implicit obligations are theorized to be more prone to breach because there is an increased potential for incongruence between the employees' and the employers' perceptions (Morrison & Robinson, 1997). However, results on the role of implicitness versus explicitness on breach have been inconsistent. For example, Robinson and Morrison (2000) found no significant differences in the relationship between implicit and explicit promises and PC breach, whereas Zhao and colleagues (2007) concluded that explicitly regulated inducements are less likely to be breached, and Conway and Briner (2002) reported a higher percentage of explicit promises (59%) being breached than implicit promises (41%). However,

these studies did not distinguish between obligated and delivered levels of inducements, nor did they focus on temporal fluctuations.

We propose that obligated and delivered levels of implicitly communicated inducements will show more temporal fluctuations. Implicit obligations, compared to explicit ones, are less concrete, and employees' perception of the extent to which their employer owes each of these obligations may alter over time (Robinson, Kraatz, & Rousseau, 1994). Explicit obligations are objective, verifiable, and contain low levels of uncertainty (Montes & Irving, 2008). Therefore, explicitly communicated obligations as well as the delivery of these obligations are less likely to fluctuate over time. For example, obligations pertaining to pay raises are often communicated explicitly—e.g., in writing—making them more resistant to temporal fluctuations.

Hypothesis 6: There will be more WPV when inducements were communicated implicitly compared to explicitly.

Methods

Sample

We recruited 421 working students from a medium-sized Canadian university, who participated in exchange for credits. Individuals could only participate if they held a paid job at the time of the study. Participants were randomly assigned to a diary survey with either a daily or a weekly time-frame.

Daily time-frame. 267 participants (86.5 % female) were assigned to the daily time-frame diary survey. Their average age was 20.4 years (*SD* = 3.49) and 10% of the participants held a managerial position. A small portion of the participants (2%) indicated they were part-time employees. According to the classification of Gottschalk and Hansen (2003), the majority of the participants had college-jobs, in particular, 15% in administrative support occupations,

14% in service occupations, and 15% as waiters and waitresses. On average, participants had 3.94 years (*SD* = 2.96) of working experience, and all participants had worked for longer than six months. In line with recommendations to detect low quality data, we removed 15 responses of participants with very fast response times (< 2 seconds / item; DeSimone & Harms, 2017).

Weekly time-frame. 154 participants (81.2% female) were assigned to the weekly time-frame diary survey. Their average age was 20.1 years (*SD* = 2.96) and 12% of the participants held a managerial position. A small proportion (5%) of the participants indicated they were part-time employees. The majority of the participants worked in sales-related occupations (16%), cashier (14%), and administrative support occupations (12%). On average, participants had 3.2 years (*SD* =2.2) of working experience, and all participants have worked for longer than six months. Similar to the daily condition, we removed 3 responses with very fast response time.

Procedure

We distributed surveys via Qualtrics. We sent daily surveys during ten[1] consecutive working days at the end of each working day (4pm) and allowed participants to fill out the surveys until 11pm of the same day. We sent weekly surveys during four consecutive weeks on Friday 11am and allowed participants to fill out the survey until Sunday 11pm. In the first survey, we collected participants' email addresses and used this information to send out an individualized link to participants. The link expired after the completion deadline, so that all responses were collected within the same period. Respondents were only required to fill out the survey if they had worked that day or week. The study was approved by the Research Ethics Board of the second author's university (i.e., where the data was collected). All participants read and signed an informed consent form at the start of the study.

[1] Due to practical constraints, 91 of the 267 participants in the daily diary survey condition were offered eight, rather than 10, surveys on consecutive working days.

Measures

This study is part of a larger project looking at temporal fluctuations of breach and fulfilment. Consequently, we only report the measures that were used for the purposes of this study. For a full list of measures, please consult Appendix A. The same measures were used in the daily and weekly surveys, but the wording of items was altered accordingly.

Demographic variables. In the first survey, we asked participants to report their age (in years), gender, years of work experience, whether they held a managerial position or not (including the number of employees they supervise), and a description of their job function.

Extent to which inducements are obligated and delivered. In each survey, participants were required to indicate the extent to which their employer owed and delivered each of 26 inducements on a seven-point Likert scale (1 = Not at all, 7 = To a large extent). The items (see Appendix B) were adopted from research by Kickul and colleagues (2002) and Montes and Zweig (2009). Together, the inducements cover the most common obligations in PC research.

Explicitness/Implicitness of inducements. In the first survey, we asked participants to indicate for each of the 26 inducements whether their employer communicated explicitly, implicitly or not at all for this inducement.

Analyses

We used latent change score models to test Hypotheses 1-3, which describe trajectories of obligated and delivered inducements over time and how these changes relate to each other. Latent change score models, also called latent difference score models, offer a flexible way to model non-linear longitudinal data by combining features of autoregressive cross-lag models and latent curve models (Grimm, An, McArdle, Zonderman, & Resnick, 2012).

Univariate latent change score models use latent variables (e.g., $f[1]$) to separate observed scores into true scores and residual error. Next, they generate latent change scores by fixing autoregressive parameters in such a way that latent scores (e.g., $f[2]$) are a function of the latent score at the previous point in time (i.e., $f[1]$) and the change in latent scores between the current and the previous point in time (i.e., $Df[2]$). The accumulation of latent change score over time can be modelled by adding an intercept (I_f) and slope (S_f) of the latent change scores. Various specific univariate models can be estimated and compared to each other by inspecting the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC) and the Sample Size Adjusted Bayesian Information Criterion (ABIC). A constant change model specifies that latent change scores can be modeled by a constant change component, namely the slope coefficient of the latent change scores: $Df[t] = \alpha\ S_f$. A proportional change model describes that latent change scores are proportional on the previous state of the latent variable: $Df[t] = \beta\ f[t-1]$. Finally, a dual change model combines the constant and the proportional change: $Df[t] = \alpha\ S_f + \beta\ f[t-1]$.

Bivariate latent change score models can be used to examine if changes in one variable drive changes in another variable, and vice versa (Grimm et al., 2012). Such bivariate models are an extension of the univariate model by adding coupling parameters. For example, equations 1 and 2 define latent change scores in variables y and x, based on constant change ($\alpha_y\ S_y$ and $\alpha_x\ S_x$) and proportional change ($\beta_y\ y[t-1]$ and $\beta_x\ x[t-1]$). In addition, each equation contains a coupling parameter ($\gamma_{yx}\ x[t-1]$ and $\gamma_{xy}\ y[t-1]$) which defines that change in one variable can be explained by the state of the other variable at a previous point in time. These bivariate latent change score models can be extended even further by adding a change on change component (see equations 3 and 4), meaning that latent change scores can be explained by previous change

in the same latent variable (ϕ_y $\Delta y[t-1]$ and ϕ_x $\Delta x[t-1]$) and by change in the other latent variable (ξ_{yx} $\Delta x[t-1]$ and ξ_{xy} $\Delta y[t-1]$).

$$\Delta y[t]=\alpha_y \ S_y+ \beta_y \ y[t-1]+\gamma_{yx} \ x[t-1], \quad \text{Equation 1}$$

$$\Delta x[t]=\alpha_x \ S_x+ \beta_x \ x[t-1]+\gamma_{xy} \ y[t-1] \quad \text{Equation 2}$$

$$\Delta y[t]=\alpha_y \ S_y+ \beta_y \ y[t-1]+\gamma_{yx} \ x[t-1]+ \phi_y \ \Delta y[t-1]+ \xi_{yx} \ \Delta x[t-1], \quad \text{Equation 3}$$

$$\Delta x[t]=\alpha_x \ S_x+ \beta_x \ x[t-1]+\gamma_{xy} \ y[t-1]+ \phi_x \ \Delta x[t-1]+ \xi_{xy} \ \Delta y[t-1] \quad \text{Equation 4}$$

To test Hypotheses 4-6, regarding the amount of within-person temporal fluctuations, we used Intraclass Correlation Coefficients (ICCs) by estimating multilevel regression models to partition the variance in a variable into a within-person and a between-person component (Hox, 2010). The ICC indicates the percentage of variance in a variable that can be attributed to between-person differences. Hence, 1-ICC captures the WPV or temporal fluctuations. In line with previous research, higher WPVs indicate more within-person temporal fluctuations (McCormick et al., 2018). To enable comparison of the daily and the weekly time-frames, all ICC values were estimated based on the first four measurement moments.

Results

Descriptive statistics

Tables 1 and 2 show the means and standard deviations of the focal variables in this study, aggregated across measurement moments and participants, for the daily and weekly surveys respectively. There is a high amount of agreement in the aggregated scores for obligated inducements ($r(24) = .97$, $p < .001$), delivered inducements ($r(24) = .98$, $p < .001$), and percentages of participants rating inducements as explicit ($r(24) = .93$, $p < .001$) or implicit ($r(24) = .81$, $p < .001$) between the daily and the weekly surveys.

INSERT TABLES 1 AND 2 ABOUT HERE

Univariate latent change score models

We estimated univariate latent change score models for obligated and delivered inducements in both the daily and weekly surveys. Each time, we estimated and compared four models: a proportional change model, a constant change model, a dual change model, and a change on change model. Table 3 shows the model fit criteria for all estimated models. Based on these criteria, we selected constant change models for obligated and delivered inducements in the daily condition, and a proportional change model and a change on change model for obligated and delivered inducements respectively in the weekly condition.

Table 4 shows parameter estimates of the selected models. The daily condition observes a linear decline in obligated and delivered inducements. However, there was a significant amount of variance around the intercept and slope of obligated and delivered inducements, meaning that some respondents experienced a steeper decline over time, whereas others an incline. In the weekly condition, the proportional change parameter for obligated inducement was not significantly different from zero, suggesting that perceptions of obligated inducements remained stable over time. Perceptions of delivered inducements were driven by various factors because the constant change, proportional change, and change on change parameters were all significant.

To facilitate the interpretation of these results, we plotted trajectories of obligated and delivered inducements in the daily and weekly conditions. To show variation between participants, we plotted the average trajectories as well as trajectories with intercept and slope parameters one standard deviation (SD) below and above the average. As shown in Figure 2, the daily condition is characterized by linear change in both obligated and delivered inducements over time, whereas the weekly condition shows no change in obligated inducements but complex

nonlinear change in delivered inducements. These results suggest that Hypothesis 1 can be partially confirmed in the daily condition and not supported in the weekly condition.

INSERT TABLES 2 AND 3 ABOUT HERE

Bivariate latent change score models

We estimated seven distinct—with increasing complexity in the degree to which obligated and delivered inducements were coupled to each other—bivariate latent change score models in the daily and weekly surveys. Both survey conditions encountered convergence issues due to small and non-significant slope parameters for both obligated and delivered inducements. We therefore omitted these parameters from the model and estimated models without a constant change element. Table 5 offers an overview of the model fit indicators for all bivariate models. Based on these indicators, we selected the bidirectional coupling model for the daily condition and the full model for the weekly condition.

INSERT TABLES 5 AND 6 ABOUT HERE

Table 6 contains parameter estimates for the selected models. In the daily condition, there are significant negative effects of the level of obligated/delivered inducements at the previous point in time on change in obligated/delivered inducements. In addition, there are significant positive effects of the level of delivered/obligated inducements at the previous point in time on change in obligated/delivered inducements. To interpret these effects, we plotted the trajectories of obligated and delivered inducements for all combinations of low (-1SD), average, and high (+1SD) values of obligated and delivered inducements at the first measurement moment (see Figure 3). As shown in this figure, there is a small decrease over time in obligated and delivered inducements when there is no discrepancy between both (i.e., when both are low, average, or high). When obligated and delivered inducements diverge at the first measurement moment, their

trajectories converge towards each other over time. The significant parameter (γ) coupling level of delivered/obligated inducements to change in obligated/delivered inducements means that obligated and delivered inducements mutually influence each other, thereby supporting Hypotheses 2 and 3. However, the level of delivered inducements appears to be a stronger driver of changes in obligated inducements than the other way around.

INSERT FIGURES 2-3 ABOUT HERE

In the weekly condition, we again found significant negative effects of the level of obligated/delivered inducements at a prior point in time and significant positive effects of the level of delivered/obligated inducements at a prior point in time on change in obligated/delivered inducements. Although the model fit indices suggest that the full model has the best fit, implying the presence of change on change, effects of change in obligated/delivered inducements at a prior point in time and the effects of change in delivered/obligated inducements at a prior point in time on change in obligated/delivered inducements were not significant. Figure 4 shows trajectories for combinations of low (-1SD), average, and high (+1SD) values of obligated/delivered inducements at the first measurement moment. As shown in the figure, trajectories of obligated and delivered inducements remain fairly stable when there is no discrepancy between them at the first measurement moment. However, when there is a discrepancy at the first measurement moment, complex non-linear trajectories appear, with larger discrepancies associated with stronger fluctuations. In particular, obligated and delivered inducements appear to fluctuate in opposite directions, meaning that periods of over-fulfilment are followed by periods of under-fulfilment and vice versa. Again, the parameter estimates (γ) suggest that obligated and delivered inducements mutually influence each other, thereby supporting Hypotheses 2 and 3.

INSERT FIGURE 4 ABOUT HERE

Indices of temporal variation

INSERT TABLE 7 ABOUT HERE

Table 7 offers an overview of the WPV indices for each obligated and delivered inducement in the daily and weekly conditions. Overall, the averages of the WPV indices demonstrate that the majority of the variation situates at the within-person rather than between-person level. There appears to be little correspondence between the ordering of the WPV indices at the daily and weekly level ($r_{\text{obligated daily, obligated weekly}} = -.12$, $p = .55$; $r_{\text{delivered daily, delivered weekly}} = .27$, $p = .18$). However, certain inducements scored consistently high on WPV, such as well-defined job responsibilities, job autonomy and control, and a reasonable workload, whereas certain inducements consistently low on WPV—indicating more stability—such as reasonable work-life balance, tuition reimbursement, and opportunities for promotion and advancement.

To test Hypotheses 4-6, we ran a multilevel regression model with WPV as the dependent variable and implicitness, explicitness, time (daily versus weekly) and type (obligated versus delivered) as independent variables. We compared this model with a multilevel regression model which includes the three-way interactions between explicitness/implicitness, time and type. The model with the interaction effects offered a significantly worse fit to the data compared to the model with only main effects ($\chi^2(7) = 34.61$, $p < .001$). In the main effects model, we found a significant positive effect of explicitness (*beta* = .23, $p = .002$) on WPV, whereas the effect of implicitness was not significant (*beta* = .07, $p = .58$). The effects of type (*beta* = -.04, $p = .03$) and time (*beta* = -.07, $p < .001$) were significantly negative, respectively indicating that there was less WPV for obligated compared to delivered inducements and for weekly compared to daily time-frames, thus supporting Hypotheses 4 and 5 but failed to support Hypothesis 6.

Discussion

Our goal was to explore temporal dynamics in perceptions of obligated and delivered inducements in the traditional employer-employee relationship and advance our understanding of the factors shaping WPV of breach and fulfilment perceptions. Results from the univariate latent change score models showed that perceptions of obligated and delivered inducements tend to change linearly over time when using daily measures, whereas the weekly condition shows more complex non-linear patterns for delivered inducements and stable patterns for obligated inducements. The bivariate latent change score models showed that perceptions of obligated and delivered inducements form a dynamic system because they influence each other over time in both survey conditions. Moreover, perceptions of obligated and delivered inducements are highly dynamic because the amount of WPV was higher than .50 on average, suggesting that there are more differences within than between individuals. Although differences in temporal variability indices could be discerned between inducements, we found that perceptions of obligated and delivered inducements fluctuated even for inducements that were previously considered to be relatively stable, such as a competitive wage. We could confirm that there is more WPV when using daily compared to weekly surveys and for perceptions of obligated compared to delivered inducements. Contrary to our expectations, we found more WPV in explicitly communicated inducements, while implicitness was unrelated to WPV.

Theoretical implications

The first and foremost theoretical implication of our findings is that perceptions of obligated and delivered inducements form a dynamic system (Thiétart & Forgues, 1995). The temporal fluctuations of perceptions of obligated and delivered inducements influence each other and, thus, drive changes in perceptions of breach and fulfilment. Hence, perceptions of the extent to which inducements are obligated do not appear to form a stable reference norm against which

perceptions of delivered inducements are evaluated; rather, this reference norm is prone to fluctuations over time as well (Schalk & Roe, 2007). Based on the dynamic phase model of PCs (Rousseau et al., 2018), we predicted gradual increases in perceptions of obligated inducements and explored the pattern of change in delivered inducements. However, we found that the trajectories of both obligated and delivered inducements cannot be simplified to linear or stable patterns. In contrast, it is possible that the gradual changes in obligated inducements only become salient with longer time-frames (e.g., months or years) because the underlying driving forces such as value-drift can be slow processes. In line with Control Theory, we found that changes in obligated/delivered inducements were related to subsequent changes in delivered/obligated inducements respectively.

Both the univariate and the bivariate latent change score models confirm that perceptions of obligated and delivered inducements form dynamic systems. The univariate models contain negative feedback loops for obligated and delivered inducements, resulting in a dynamic system where obligated and delivered inducements tend to converge towards a stable equilibrium (Thiétart & Forgues, 1995). The bivariate models contain both negative and positive feedback loops, resulting in a more complex dynamic system (Thiétart & Forgues, 1995). Our weekly condition results show that this system shifts between two attractors — under- and over-fulfilment. These shifts depend on the starting values of the system, with larger fluctuations as discrepancies between obligated and delivered inducements increase. Opponent process theory (Solomon & Corbit, 1973) provides a plausible explanation for these shifts: an overshoot effect. Responses to a PC breach can be divided into primary and opponent process. When an employee experiences an under-fulfilment, the primary process is to lower the perception of obligated inducements through a feedback loop to return to the equilibrium (Carver & Scheier, 2002).

However, the opponent process (i.e., neutralization of the primary process) decays at a slower pace than the primary process, so the employee experiences a state opposite of the primary process (Bowling et al., 2005). In other words, when experiencing a breach, employees over-adjust their perception of obligated inducements before returning to an attractor state, as demonstrated in the weekly condition (Figure 4).

Second, our findings show that the ideal time-frame to study WPV in PC breach and fulfilment depends on the aims of the researcher. If the aim is to maximize WPV, a daily time-frame seems to be better than a weekly time-frame. This finding echoes conclusions by McCormick and colleagues (2018), who found that there was more WPV within a day than between days. We extend this finding by showing that there is more WPV in perceptions of obligated and delivered inducements within a week than between weeks. Therefore, PC researchers who aim for as much WPV as possible may be advised to choose the shortest feasible time-interval. However, researchers aiming to investigate complex non-linear breach and fulfilment trajectories are advised to adopt a weekly time-frame. We found linear patterns when using daily time-frames within a single-week and non-linear patterns when using weekly time-frames. These differences between the daily and weekly time-frames may suggest that the workweek forms a meaningful unit of time for employees when evaluating their PC (Bakker & Bal, 2010). The workweek may be considered a separate episode during which events, such as breaches and fulfilments, occur. The weekend may then offer opportunities to recover and 'reset' these evaluations, so that the next workweek is seen as a new episode. However, this does not imply that events during one workweek have no effect on events during the next workweek. Indeed, our findings regarding the over-shoot effect in weekly time-frames align with studies that

found primary and secondary reactions to PC breaches (Hofmans, Vantilborgh, & Solinger, 2017).

Finally, we found differences in WPV between inducements. Most studies overlook these temporal differences by aggregating across inducements when examining perceptions of breach and fulfilment. We demonstrated that there were more fluctuations in perceptions of delivered than obligated inducements. Moreover, inducements fluctuated more when they were communicated explicitly. Although this finding contradicted our hypothesis, it is possible that explicit inducements fluctuate more because they are more easily monitored (Morrison & Robinson, 1997). Overall, we show that WPV can be observed for all inducements. Some scholars have questioned the need for a dynamic approach to PC research because they believed that some inducements, such as pay, would be stable over time. The fact that we found substantial WPV for all inducements shows that a dynamic approach to PC research is warranted.

Practical implications

First, temporal fluctuations are found for all inducements, even those that are seemingly undisputable, such as wage and job responsibilities. Having this information will help managers better understand employees' perceptions of the employment relationship, especially when it concerns employees' reactions to delivered inducements. Second, it is important for managers to understand that employees show primary and secondary reactions to PC breach (Hofmans et al., 2017). The over-shoot effect that emerged from our data has important implications, as it means that initial positive employee reactions to over-fulfilment may lead to secondary negative reactions due to temporary feelings of under-fulfilment. Although organizational responses to primary reactions seems advisable (Rousseau et al., 2018), the secondary reactions may not need

any response as they may be short-lived overshoot effects that dissipate as the individual returns to a more stable attractor state. Third, managers are often advised to clearly communicate about mutual obligations in the PC. By agreeing on the mutual obligations, future PC breaches may be avoided. However, such communication can backfire when not executed well. When inducements are made too explicit, employees may monitor the changes of these inducements very closely and experience more fluctuations in the obligated and delivered levels (Morrison & Robinson, 1997). Therefore, managers may want to avoid making explicit promises for inducements in which they foresee fluctuations. Without explicit promise, employees will perceive these inducements as more implicit, and experience less fluctuations.

Limitations

First, we did include longer time-frames, that span months or years (Dormann & Van de Ven, 2014). Instead, we compared the two most commonly used time-frames. Naturally, we recommend future research to extend our results by using different time-frames. Second, our participants worked in various industries, with various types of employment contracts and positions. Due to our sampling strategy, participants were relatively young (average age of 20 years old) and female (more than 80%) in both the daily and weekly conditions. Bal and Smit (2012) found that young employees are not as good as older workers at regulating their emotions, focus less on the positive aspects of their relationship with the employer, and experience PC breach more strongly than older workers. Therefore, the findings of this study cannot be generalized to the wider employee population. Third, we focused on the traditional employer-employee relationship, thus restricting our findings from generalizing to relationships with other organizational agents. This traditional relationship does not capture the full extent of the social context arising during interactions between different agents, such as recruiters, managers and

colleagues, which may influence perceived quality of the exchange relationships (Alcover & Turnley, 2016). Therefore, a multi-foci approach may eventually expand our understanding of the PC.

Recommendations for future research

To further understand the temporal characteristics of PCs, future research may build on Dynamic Systems Theory to study temporal PC processes at various levels (Thiétart & Forgues, 1995). At the interpersonal level, the PC can be seen as an exchange relationship between two actors (e.g., employee and manager). Both actors' behaviors—such as the delivery of inducements and contributions—are continuously influencing each other, forming a complex system at the interpersonal level. Moreover, these actors are imbedded in teams, departments, and organizations, further adding to the complexity of the dynamic system. Therefore, we encourage future research to further integrate dynamic systems theory and multi-foci approach into dynamic PC models.

We aimed to explain variation in temporal fluctuations of obligated and delivered inducements based on implicit and explicit characteristics of the inducements, demonstrating that explicitly communicated inducements display more temporal fluctuations than implicitly communicated inducements. Future research could focus on other characteristics of inducements, such as the importance that employees attach to each inducement. Inducement valuation closely relates to employees' needs and may result in more vigilant monitoring of the discrepancies between obligated and delivered levels of important inducements (Lambert et al., 2003). It is possible that employees experience more fluctuations in more important inducements.

Finally, the temporal dynamics of obligated and delivered inducements are closely related to the temporal fluctuations of PC fulfilment and breach perceptions. However, breach and

fulfilment perceptions are shaped by a host of factors, including a history of breach, a history of remedied breaches, witnessing co-workers' breach, personal life changes, to name a few. We therefore recommend future research to investigate the impact of these factors as well.

Conclusion

We examined the temporal dynamics of obligated and delivered inducements and found that the interaction between these two elements drives changes in the perception of PC breach. By using daily and weekly time-frames, we conclude that the choice of time frames is not straightforward and depends on the aim of the researcher. The daily time-frame maximizes temporal fluctuations of obligated and delivered inducements, whereas the weekly time-frame reflects more complex trajectories. Both implicitly and explicitly communicated inducements fluctuate over time, with explicitly communicated inducements showing more fluctuations.

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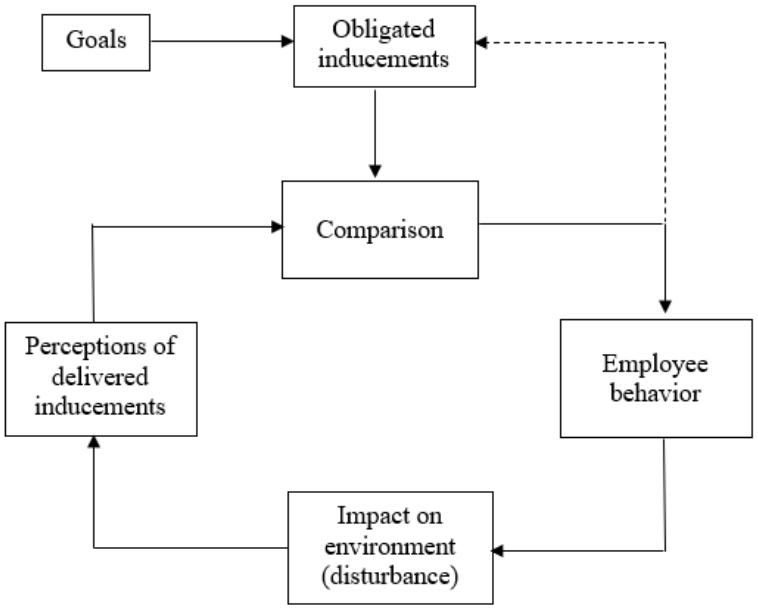

Figure 1. The feedback loop in the psychological contract, based on the simple feedback loop by Klein (1989)

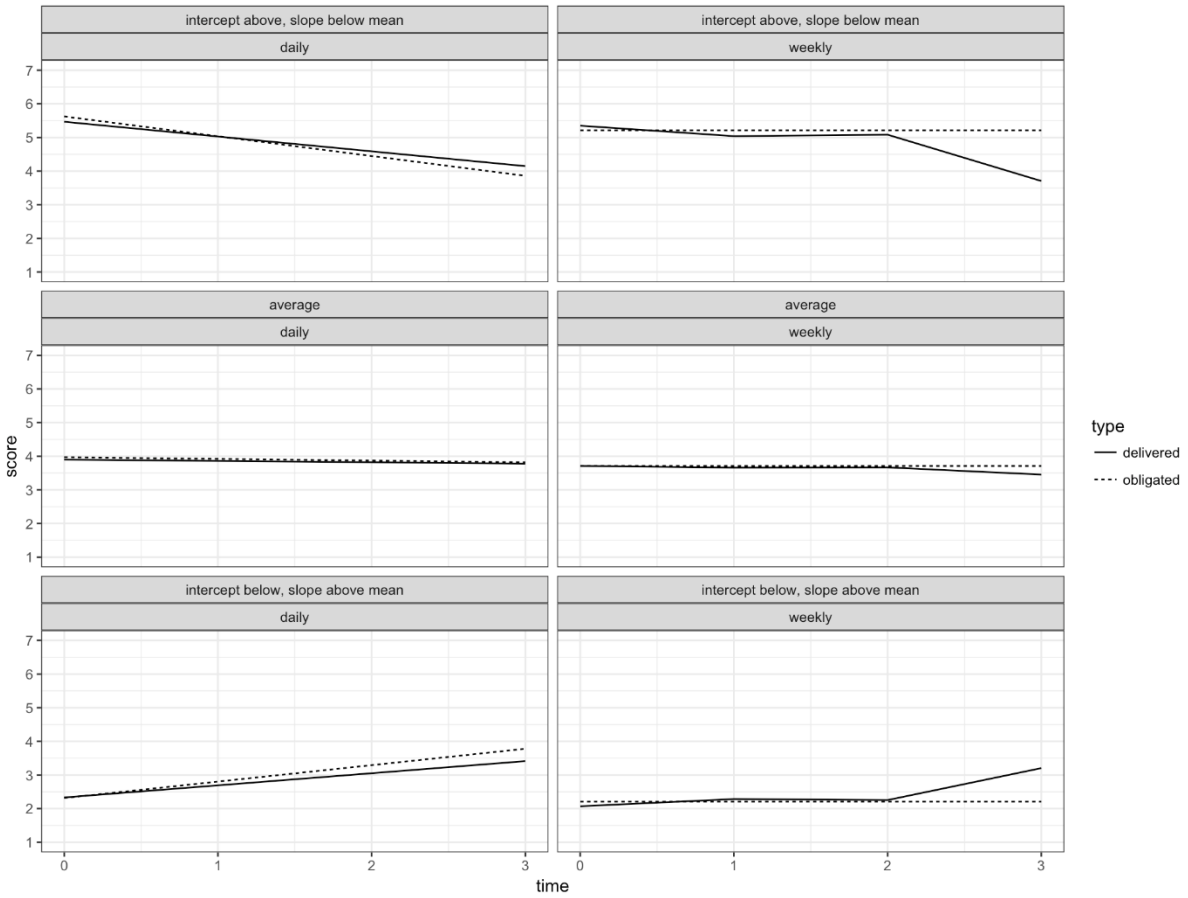

Figure 2. Trajectories of obligated and delivered inducements in the daily and weekly surveys, based on results of univariate latent change score models.

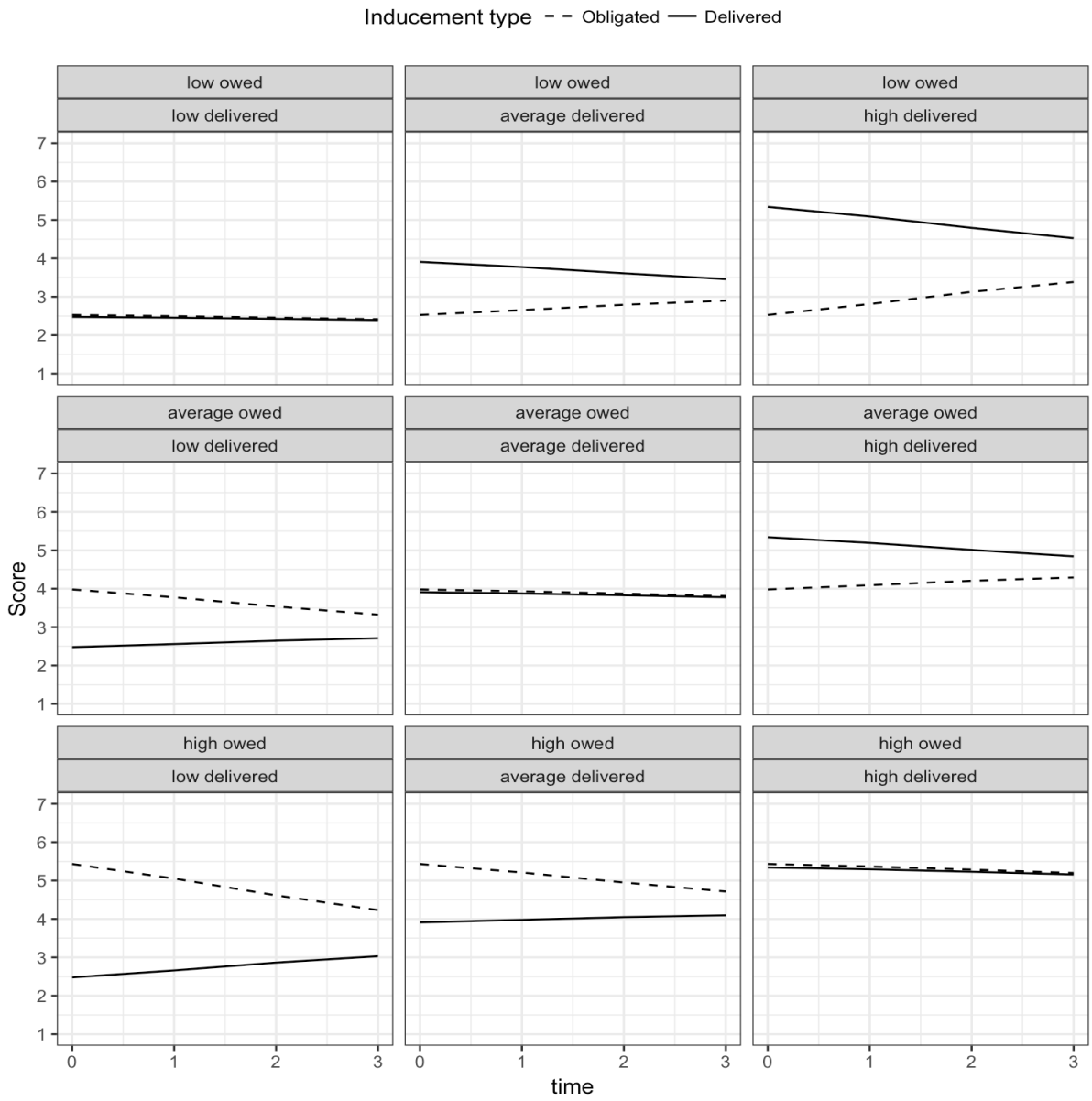

Figure 3. Daily survey condition trajectories of obligated and delivered inducements over time for combinations of low, average, and high values of obligated and delivered inducements at the first measurement moment.

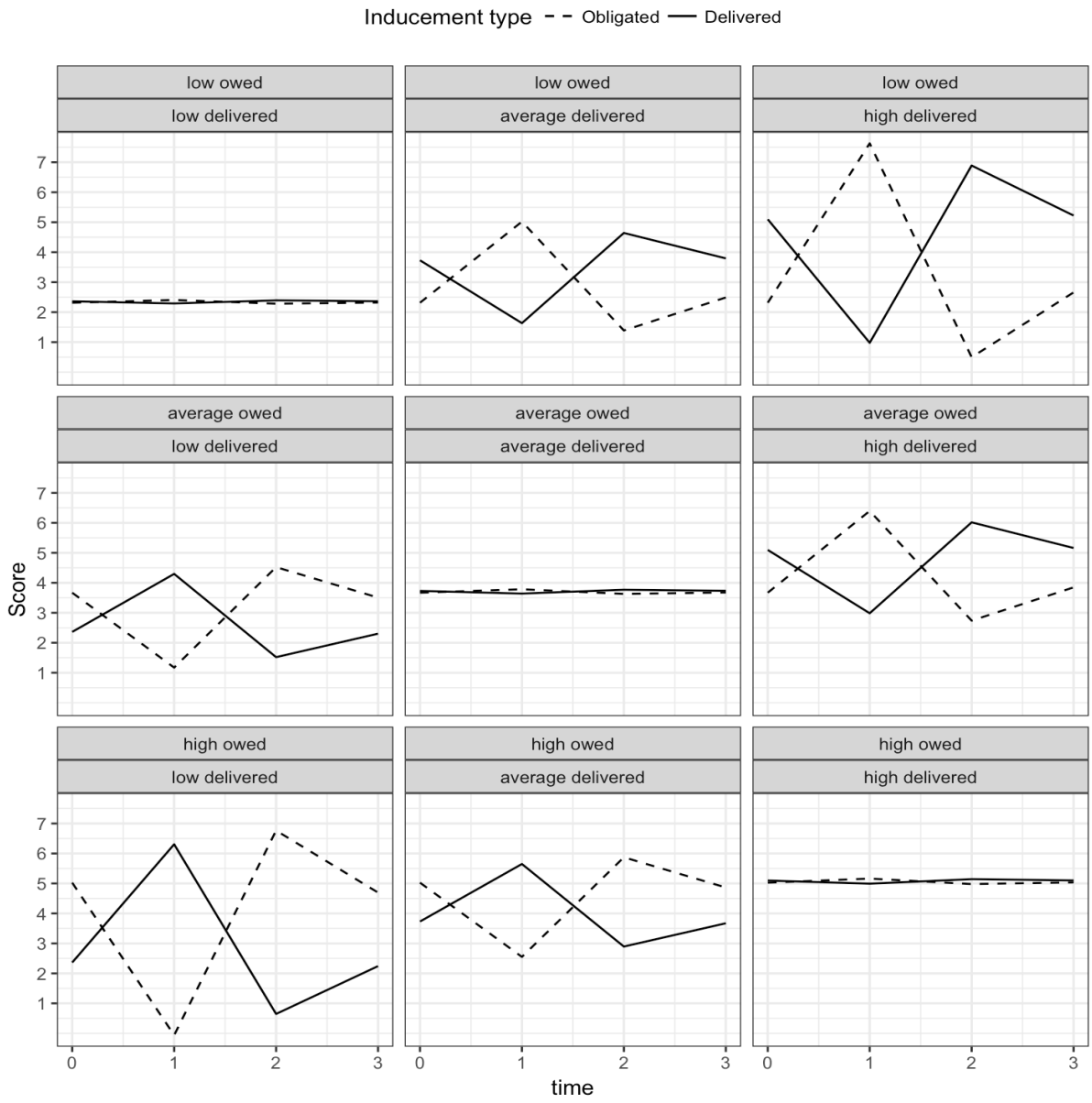

Figure 4. Weekly survey condition trajectories of obligated and delivered inducements over time for combinations of low, average, and high values of obligated and delivered inducements at the first measurement moment.

Table 1. Descriptive statistics for the 26 inducements in the daily surveys.

Inducement	Obligated		Delivered		Explicit-ness	Implicit-ness
	M	*SD*	*M*	*SD*		
1. Competitive wage	3.74	1.93	3.64	1.89	.27	.26
2. Attractive benefits	3.01	1.98	2.62	1.80	.17	.15
3. Attractive bonuses	2.82	1.76	2.44	1.67	.16	.14
4. Job security	4.39	1.86	4.57	1.80	.25	.38
5. Approachable supervisors	4.81	1.91	4.78	1.86	.49	.35
6. Fair and respectful treatment	5.40	1.85	5.18	1.71	.58	.32
7. Superiors that show concern for your wellbeing	4.50	1.86	4.53	1.85	.48	.33
8. Reasonable work-life balance	4.22	1.81	4.46	1.71	.39	.31
9. Enough resources to perform job	4.99	1.82	4.93	1.69	.58	.23
10. Well-defined job responsibilities	4.79	1.79	4.63	1.70	.62	.29
11. Meaningful work	3.61	1.78	3.66	1.77	.44	.29
12. Participation in decision-making	3.25	1.72	3.24	1.71	.30	.30
13. Freedom to be creative	3.07	1.79	3.15	1.84	.25	.27
14. Job autonomy and control	3.57	1.72	3.75	1.67	.28	.30
15. Opportunities for professional growth	3.58	1.77	3.50	1.85	.33	.24
16. Continual professional training	3.48	1.90	3.37	1.90	.40	.18
17. Career guidance and mentoring	3.25	1.88	3.14	1.80	.33	.20
18. Job training	3.93	2.07	3.72	1.99	.70	.15
19. Tuition reimbursement	2.12	1.77	1.95	1.65	.06	.04
20. Recognition of accomplishments	3.99	1.78	3.73	1.78	.42	.24
21. Reasonable workload	4.62	1.67	4.53	1.61	.45	.35
22. Safe working environment	5.38	1.93	5.35	1.72	.62	.25
23. Challenging and interesting work	3.49	1.75	3.53	1.79	.29	.29
24. Opportunities to develop new skills	3.55	1.68	3.54	1.80	.37	.35
25. Increasing responsibilities	3.23	1.73	3.33	1.79	.42	.29
26. Opportunities for promotion and advancement	3.18	1.81	2.82	1.69	.20	.32

Notes. Explicitness is calculated as: explicit / (implicit + explicit + not communicated). Implicitness is calculated as: implicit / (implicit + explicit + not communicated).

Table 2. Descriptive statistics for the 26 inducements in the weekly surveys.

Inducement	Obligated		Delivered		Explicit-ness	Implicit-ness
	M	*SD*	*M*	*SD*		
1. Competitive wage	3.61	1.94	3.50	2.07	.33	.22
2. Attractive benefits	2.64	1.93	2.39	1.86	.14	.20
3. Attractive bonuses	2.69	1.88	2.26	1.61	.19	.21
4. Job security	4.45	1.95	4.63	1.83	.27	.40
5. Approachable supervisors	4.78	1.84	4.79	1.77	.49	.37
6. Fair and respectful treatment	5.16	1.87	5.24	1.66	.54	.36
7. Superiors that show concern for your wellbeing	4.59	1.88	4.58	1.83	.42	.43
8. Reasonable work-life balance	4.06	1.93	4.14	1.91	.35	.35
9. Enough resources to perform job	4.76	1.87	4.68	1.71	.52	.34
10. Well-defined job responsibilities	4.54	1.87	4.57	1.64	.64	.27
11. Meaningful work	3.67	1.88	3.86	1.90	.34	.40
12. Participation in decision-making	3.34	1.85	3.28	1.86	.30	.34
13. Freedom to be creative	3.07	1.88	3.32	1.89	.31	.31
14. Job autonomy and control	3.74	1.79	3.79	1.83	.32	.32
15. Opportunities for professional growth	3.50	1.82	3.37	1.82	.30	.36
16. Continual professional training	3.32	1.94	3.25	1.91	.33	.31
17. Career guidance and mentoring	2.88	1.81	2.84	1.86	.20	.30
18. Job training	3.47	1.98	3.31	1.88	.56	.25
19. Tuition reimbursement	1.90	1.53	1.69	1.35	.05	.11
20. Recognition of accomplishments	3.71	1.82	3.63	1.91	.37	.34
21. Reasonable workload	4.44	1.78	4.31	1.73	.30	.50
22. Safe working environment	4.76	2.02	4.97	1.92	.54	.33
23. Challenging and interesting work	3.32	1.84	3.38	1.76	.25	.39
24. Opportunities to develop new skills	3.54	1.88	3.42	1.78	.31	.38
25. Increasing responsibilities	3.07	1.82	3.18	1.89	.28	.39
26. Opportunities for promotion and advancement	2.63	1.72	2.48	1.64	.17	.30

Notes. Explicitness is calculated as: explicit / (implicit + explicit + not communicated). Implicitness is calculated as: implicit / (implicit + explicit + not communicated).

Table 3. Fit statistics for univariate latent change score models for obligated and delivered inducements in the daily and weekly surveys.

	Obligated inducements							
	Daily survey				Weekly survey			
	Proportional change	Constant change*	Dual change	Changes to changes	Proportional change*	Constant change	Dual change	Changes to changes
AIC	31879.61	31802.16	31804.04	<u>31799.30</u>	<u>22140.36</u>	22157.58	22195.45	22161.91
BIC	31925.06	<u>31841.12</u>	31849.49	31851.24	<u>22184.38</u>	22195.31	22233.17	22205.93
ABIC	31902.81	<u>31822.05</u>	31827.25	31825.82	<u>22162.13</u>	22176.25	22214.11	22183.68
	Delivered inducements							
	Daily survey				Weekly survey			
	Proportional change	Constant change*	Dual change	Changes to changes	Proportional change	Constant change	Dual change	Changes to changes*
AIC	31669.20	<u>31633.68</u>	31634.67	31635.98	<u>22149.60</u>	22154.07	22222.38	22068.13
BIC	31714.65	<u>31672.63</u>	31680.11	31687.92	22193.62	22191.79	22260.11	<u>22118.44</u>
ABIC	31692.41	<u>31653.67</u>	31657.87	31662.50	22171.37	22172.73	22241.05	<u>22093.02</u>

Notes. AIC = Akaike Information Criteria, BIC = Bayesian Information Criteria, ABIC = Sample Size Adjusted Bayesian Information Criteria. Lowest AIC, BIC, and ABIC values are underlined for ease of interpretation. * denotes selected model.

Table 4. Parameter estimates for chosen univariate latent change score models for obligated and delivered inducements in the daily and weekly surveys.

	Daily survey		Weekly survey	
	Obligated	Delivered	Obligated	Delivered
	Constant change	Constant change	Proportional change	Changes to changes
Fixed effects:				
μ_{y0}	3.97 (.19) ***	3.90 (.20) ***	3.71 (.16) ***	3.71 (.18) ***
μ_s	-.05 (.02) **	-.04 (.02) *	--	-12.18 (3.32) ***
β	--	--	.00 (.01)	3.27 (.91) ***
ϕ	--	--	--	-4.41 (.91) ***
Random effects:				
σ^2_{y0}	2.74 (.18) ***	2.46 (.20) ***	2.26 (.16) ***	2.69 (.20) ***
σ^2_s	.29 (.02) ***	.16 (.02) ***	--	31.65 (14.90) *
$\sigma_{y0,s}$	-.54 (.03) ***	-.35 (.03) ***	--	-9.21 (2.02) ***
σ^2_u	1.71 (.08) ***	1.81 (.06) ***	1.72 (.10) ***	1.47 (.08) ***

Notes. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5. Fit statistics for bivariate latent change score models in the daily and weekly surveys.

Daily survey

	No coupling	Delivered [t-1] → ΔObligated [t]	Obligated [t-1] → ΔDelivered [t]	Bidirectional coupling *	ΔDelivered [t-1] → ΔObligated [t]	ΔObligated [t-1] → ΔDelivered [t]	Full model
AIC	58905.54	58785.72	58798.31	<u>58778.16</u>	58780.15	58780.13	58781.98
BIC	58983.46	58870.13	58882.72	<u>58869.06</u>	58877.55	58877.52	58885.87
ABIC	58945.33	58828.82	58841.41	<u>58824.57</u>	58829.89	58829.86	58835.03

Weekly survey

	No coupling	Delivered [t-1] → ΔObligated [t]	Obligated [t-1] → ΔDelivered [t]	Bidirectional coupling	ΔDelivered [t-1] → ΔObligated [t]	ΔObligated [t-1] → ΔDelivered [t]	Full model *
AIC	40825.39	40786.74	40793.71	40784.52	40788.98	40763.48	<u>40738.76</u>
BIC	40900.84	40868.49	40875.46	40872.56	40883.30	40857.80	<u>40839.37</u>
ABIC	40862.71	40827.18	40834.15	40828.07	40835.64	40810.14	<u>40788.53</u>

Notes. AIC = Akaike Information Criteria, BIC = Bayesian Information Criteria, ABIC = Sample Size Adjusted Bayesian Information Criteria. Lowest AIC, BIC, and ABIC values are underlined for ease of interpretation. * denotes selected model.

Table 6. Parameter estimates for chosen bivariate latent change score models for obligated and delivered inducements in the daily and weekly surveys.

	Daily surveys: Bidirectional coupling		Weekly surveys: Full model	
	Obligated	Delivered	Obligated	Delivered
Fixed effects				
μ_{y0}	3.98 (.18) ***	3.91 (.20) ***	3.67 (.15) ***	3.73 (.18) ***
μ_s	--	--	--	--
β	-.12 (.02) ***	-.08 (.02) ***	-1.91 (.63) ***	-1.48 (.56) **
γ	.11 (.02) ***	.07 (.02) ***	1.91 (.62) ***	1.48 (.55) **
ϕ	.33 (.26)	.35 (.30)	-4.12 (6.70)	6.53 (6.61)
ξ	--	--	-6.67 (5.51)	4.32 (7.38)
Random effects				
Univariate				
σ^2_{y0}	2.11 (.19) ***	2.05 (.21) ***	1.84 (.17) ***	1.87 (.17) ***
σ^2_s	--	--	--	--
$\sigma_{y0,s}$	--	--	--	--
σ^2_u	2.13 (.07) ***	2.06 (.06) ***	2.23 (.13) ***	2.27 (.11) ***
Bivariate				
$\sigma_{y0,y0}$	1.33 (.19) ***		1.94 (.16) ***	
$\sigma_{y0,s}$	--		--	
$\sigma_{s,y0}$	--		--	
$\sigma_{s,s}$	--		--	
$\sigma_{u,u}$	1.38 (.06) ***		.88 (.09) ***	

Notes. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 7. Indices of within-person temporal variation for obligated and delivered inducements in the daily and weekly survey conditions.

	Daily		Weekly	
	Obligated	Delivered	Obligated	Delivered
1. Competitive wage	.55	.61	.53	.62
2. Attractive benefits	.64	.64	.51	.47
3. Attractive bonuses	.66	.76	.46	.74
4. Job security	.61	.71	.66	.74
5. Approachable supervisors	.72	.64	.66	.74
6. Fair and respectful treatment	.68	.76	.56	.65
7. Superiors that show concern for your wellbeing	.56	.60	.46	.55
8. Reasonable work-life balance	.56	.56	.59	.71
9. Enough resources to perform job	.56	.71	.72	.79
10. Well-defined job responsibilities	.62	.69	.76	.90
11. Meaningful work	.54	.72	.48	.59
12. Participation in decision-making	.67	.69	.51	.74
13. Freedom to be creative	.72	.73	.67	.62
14. Job autonomy and control	.73	.76	.49	.66
15. Opportunities for professional growth	.66	.63	.70	.68
16. Continual professional training	.63	.60	.53	.64
17. Career guidance and mentoring	.86	.72	.49	.56
18. Job training	.68	.60	.60	.82
19. Tuition reimbursement	.66	.58	.33	.78
20. Recognition of accomplishments	.67	.64	.51	.43
21. Reasonable workload	.58	.78	.70	.80
22. Safe working environment	.67	.64	.61	.62
23. Challenging and interesting work	.72	.65	.49	.66
24. Opportunities to develop new skills	.64	.67	.58	.71
25. Increasing responsibilities	.70	.73	.64	.74
26. Opportunities for promotion and advancement	.65	.51	.40	.47
Mean	.65	.67	.56	.67

Notes. WPV = within-person variability (1 – ICC). WPV is calculated based on four first measurement moments in the daily survey condition, to ensure comparability with the weekly survey condition.

Appendix A	Variable	Whether used in this study
1.	Implicit and explicit communication	Yes
2.	How long a breach event stays relevant	No
3.	Global measure of the extent to which inducements are perceived to be obligated	No
4.	Global measure of psychological contract fulfilment	No
5.	Demographic variables	Yes
6.	Need valuation	No
7.	Individual measures of perceptions of obligated and delivered inducements	Yes
8.	Psychological contract fulfilment on a daily/weekly basis	No
9.	Need satisfaction and frustration	No
10.	Employees' affective response to psychological contract breach and fulfilment	No

Appendix B

competitive wage

attractive benefits (e.g., health care and retirement)

attractive bonuses

job security

approachable superiors

fair and respectful treatment

superiors show concern for your well-being

a reasonable amount of work-family balance

enough resources to do your job

well-defined job responsibilities

meaningful work

participation in decision-making

freedom to be creative

job autonomy and control

opportunities of personal growth

continual professional training

career guidance and mentoring

job training

tuition reimbursement

recognition of your accomplishments

a reasonable workload

safe working environment

challenging and interesting work

opportunities to develop new skills

increasing responsibilities

opportunities for promotion and advancement