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Psychological contract breach and employee health: The relevance of unmet obligations for mental and physical health

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ABSTRACT

This study examines the effects of psychological contract breach (PCB) on employee mental and physical health (SF-12) using a sample of 3,870 employees derived from a German longitudinal linked employer-employee study across various industries. Results of multivariate regression models and mediation analysis suggest that PCB affects both the mental and the physical health of employees but is more threatening to employee mental health. In addition, mental health partly mediates the effects of PCB on physical health. Also, the findings of this study show that the relative importance of obligations not met by employers differs according to the specific contents of the psychological contract. In conclusion, the results of this study support the idea that PCB works as a psychosocial stressor at work that represents a crucial risk to employee health.

La ruptura del contrato psicológico y la salud de los empleados: la importancia de las obligaciones incumplidas para la salud mental

Palabras clave:
Ruptura del contrato psicológico
Salud mental
Salud física
SF-12
Estrés laboral
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RESUMEN

Este estudio analiza los efectos de la ruptura del contrato psicológico (PCB, según sus siglas en inglés) sobre la salud mental y física (SF-12) de los empleados, utilizando una muestra de 3.870 empleados obtenida de un estudio longitudinal que vincula empleador con empleado en distintas empresas alemanas. Los resultados de los modelos de regresión múltiple y de análisis de mediación indican que la PCB afecta tanto a la salud mental como a la física del empleado, pero es más amenazante para la salud mental. Además, la salud mental modera parcialmente los efectos del PCB en la salud física. Igualmente, los resultados del estudio muestran que la importancia relativa de las obligaciones no cumplidas por parte del empleado varía en función del contenido específico del contrato psicológico. En conclusión, los resultados del estudio avalan la idea de que el PCB funciona como un agente estresante psicosocial en el trabajo, lo que representa un gran riesgo para la salud del empleado.

The increasing complexity of employment relationships is particularly evident in a changing relationship of demands and gratifications (Karasek, 1979; Karasek & Theorell, 1990). As a result, current research on employer-employee relations now views these interactions as multidimensional social exchange relationships rather than as just a (direct) exchange of explicit demands and gratifications as captured by standard employment contracts (Coyle-Shapiro & Kessler, 2000; Cropanzano & Mitchell, 2005; Rousseau, 1989, 1995). In line with this approach, psychological contracts are considered to be a key concept for understanding modern employment relationships, as well as employment behavior in general (Conway & Briner, 2005; Guest, 2004; Shore & Tetrick, 1994; Zhao, Wayne, Glibkowski, & Bravo,

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2007). These unwritten, implicit contracts refer to employees' expectations regarding reciprocal exchange agreements with their employers that arise from the employees' interaction with the organization (Freese & Schalk, 1996; Rousseau, 1995; Rousseau & Greller, 1994), implying that employees expect organizations to meet certain obligations. However, if employees perceive that the organization has failed to fulfill one or more of its obligations, researchers recognize that this psychological contract breach (PCB) (Robinson & Rousseau, 1994; Rousseau, 1995) leads to the experience of job strain. More specifically, research has recognized PCB to predict employee health, because such an imbalance in the employment relationship acts as a psychosocial stressor in the work environment (Robbins, Ford, & Tetrick, 2012). In line with the effort-reward imbalance model (Siegrist, 1996), we argue that the perception of PCB represents an imbalance in the employment relationship that works as a psychosocial work stressor that leads to negative emotional states and perceived stress, which in turn lead to impaired employee mental and physical health. In this research, we focus on the stressor-strain link by analyzing the association of PCB with mental and physical health. Until now, research on the relationship between PCB and employee health has mainly focused on specific (mental) health symptoms (Gracia, Silla, Peiró, & Fortes-Ferreira, 2007) and the effect of PCB on employees' physical health in particular has been largely overlooked. Empirical studies have shown that PCB increases employee burnout (e.g., Chambel & Oliveira-Cruz, 2010; Schaufeli & Enzmann, 1998; Topa Cantisano, Morales Domínguez, & García, 2007) and is negatively associated with psychological well-being (e.g., Conway & Briner, 2002a). The first main aim of this study fills this research gap by investigating the effects of PCB on both the mental and the physical health of employees using a version of the 12-item Short Form Health Survey (the SF-12 questionnaire) (Andersen, Mühlbacher, Nübling, Schupp, & Wagner, 2007). The SF-12 assesses a person's health-related quality of life as a comprehensive measure of individual health and therefore enables us to broaden the scope of previous approaches from quite specific health symptoms to a more general perspective on employee health. We use stepwise multivariate regression analysis (hierarchical regression) to compare the effects of PCB on both of these health dimensions. Moreover, we add to the results of previous studies on the relationship between PCB and health outcomes by examining how employees' mental health mediates effects of PCB on employee physical health. The consideration of this mediation effect has been completely missing in other studies on this topic.

The second main aim of this study is to draw particular attention to a more detailed view of how PCB adds to the prediction of employee poor health by exploring the relative impact of breaches of specific obligations included in psychological contracts. For the most part, recent studies have used comprehensive measures of the overall or average extent of unmet obligations to assess the effects of PCB. Our study adds to this research by considering breaches of specific contents of the psychological contract (e.g., long-term job security, job autonomy, and social appreciation) as well as an overall imbalance in the psychological contract. So far, empirical research has neglected that unmet obligations about different contents of psychological contracts might differ in their relevance for explaining employee health outcomes. More precisely, how strongly PCB as a work stressor affects employee health is likely to depend on the specific content that has been breached.

Additionally, the design of this study is able to advance current knowledge as previous research mostly involved case studies of small samples of specific employee groups, such as soldiers (e.g., Chambel & Oliveira-Cruz, 2010) or managers (e.g., Guerrero & Herrbach, 2008). Furthermore, most of the empirical studies have been based on cross-sectional data and did not allow conclusions about causality (Conway & Briner, 2005, 2009). By using two waves of a German Linked Employer-Employee (LEEP-B3) Survey, we are able to conduct a longitudinal analysis involving 3,870 panel cases from 100 large companies representing various industries. From this large sample, which included employees from various occupational and sociodemographic groups, we were able to capture complex employment relationships in which psychological contracts are in place. This enables us to overcome the limitations of studies that have used predominantly cross-sectional analysis with highly specific samples and small sample sizes.

Psychological Contracts in Organizations

Building on the assumptions put forth in social exchange theory (Blau, 1964), the psychological contract approach explores the processes and contents of employment relationships. In particular, the aim of this approach is to cover the unwritten and possibly implicit elements of employment relationships that are based on individual perceptions and reciprocity expectations. Psychological contracts are basically defined as "individual beliefs, shaped by the organization, regarding terms of an exchange agreement between individuals and their organization" (Rousseau, 1995, p. 9). These beliefs include the fact that employees expect organizations to reward their efforts because they are bound by reciprocal obligations (Rousseau, 1989). The literature on different aspects of psychological contracts is extensive (for a detailed overview, see Conway & Briner, 2009). Some research focuses on describing differences in content, such as whether the contracts are relational or transactional (Rousseau, 1990). "Content" refers to the specific reciprocal obligations that characterize an individual's psychological contract (Rousseau & Tijoriwala, 1998). Theoretically, obligations in such contracts may include all conceivable aspects of the employment relationship (Rousseau, 1990); for example, they may involve easily quantifiable aspects (pay, working hours), social aspects (a pleasant atmosphere, social activities) and a long-term perspective (job security, career opportunities) or a short-term one (an interesting new work task). Guest (1998) argues that, in their search for a general theory, researchers should go beyond merely describing the contents of psychological contracts and seek to evaluate their status, such as determining whether obligations are being met (fulfillment) or not being met (breach).

Psychological Contract Breach (PCB)

Psychological contract breach is a subjective experience in which the employee perceives that the organization has failed to adequately fulfill one or more of the obligations included in the psychological contract (Morrison & Robinson, 1997; Rousseau, 1989). According to Morrison and Robinson (1997), PCB may be perceived to have occurred without actually having taken place; in other words, if employees believe that a breach has occurred, this perception may affect their behavior or attitudes whether or not there actually was a breach of the contract (Robinson, 1996). In this study, we specifically discuss PCB as an imbalance between what the employee expects the employer to be obligated to provide and what is perceived to be actually provided by the employer, concerning either the whole psychological contract (overall imbalance) or only specific aspects.

However, the relevance of the breach goes beyond the sheer nonfulfillment of expectations. If reciprocity is a key element of social relationships (Gouldner, 1960), an unfulfilled expectation of reciprocity is likely to harm the foundation of a relationship. Thus, even though PCB is often considered to be the opposite of contract fulfillment, this dichotomy is not quite so clear-cut (Conway & Briner, 2009).

PCB and Employee Health

Psychological contracts provide an orientation for employee attitudes and behavior through the process of reciprocity; that is, employees respond to employers' fulfillment or nonfulfillment of obligations by adjusting their attitudes and behaviors (Conway & Briner, 2005). Shore and Tetrick (1994) note that psychological contracts are a factor in employees' perception of predictability and control of the work environment and thus help alleviate uncertainty about employment conditions. However, when PCB occurs, employees are likely to experience the unmet obligations as an uncertainty within the employment relationship. Therefore, employees' perceptions of predictability and control of the work environment would decrease in the event of PCB, eventually leading to feelings of stress (Sutton, 1990). This idea is supported by the results of empirical research in which a breach of promise gave rise to a situation of unpredictability and lack of control for employees because they (in this case, soldiers) "no longer knew what to expect" (Chambel & Oliveira-Cruz, 2010, p. 122). Gakovic and Tetrick (2003) concluded that the concept of psychological contract can be integrated–both theoretically and empirically–into the literature on workplace stress, suggesting that the employment exchange relationship plays a role in employee job strain. Following Robbins et al. (2012), perceived unfairness within the employment relationship acts as a psychosocial stressor at work, leading to psychological stress reactions that are in turn associated with impaired mental and physical health. Basically, a stressor at work can be any condition or event that causes strain in an individual (Kahn & Byosiere, 1992).

In line with the effort–reward imbalance (ERI) model (Siegrist, 1996), the perception of PCB is proposed to be an imbalance in the employment relationship that leads to negative emotional states and perceived stress, which in turn exacerbate health problems. Similar to psychological contract theory, ERI theory builds on the key assumption that social exchange relationships between employees and employers are based on the reciprocity of "efforts" made by the employees (e.g., working hours, performance), which are then compensated for through appropriate gratifications or rewards (e.g., pay, career opportunities, job security, esteem) (Vegchel, Jonge, Bosma, & Schaufeli, 2005). The ERI model suggests that work characterized by considerable efforts but small rewards represents a reciprocity deficit that defines a state of emotional distress that is associated with stress reactions, which in turn cause health problems (Siegrist, 1996). ERI theory focuses on explaining employee health outcomes and has been widely used in sociological and psychological occupational health research (for overviews of empirical studies, see Tsutsumi & Kawakami, 2004; Vegchel et al., 2005). By comparison, psychological contract theory originally aims to explain work-related behavior and attitudes and is quite new in the context of health research. Therefore, the theory lacks the explicit theoretical mechanism between PCB and health. This black box that is left empty can be filled in by ERI, which puts the stress process between the imbalance of efforts and rewards and employee health. However, even though ERI investigates a broader reciprocity deficit and assumes a more general imbalance between efforts and rewards, unfulfilled obligations in the psychological contract can include quite similar aspects of efforts and rewards. In contrast, PCB explicitly describes an imbalance in the employment relationship between employee and employer that has not been investigated in detail in employee health research. Therefore, in accordance with ERI theory, we propose that PCB is a perceived imbalance that acts as a psychosocial work stressor and affects employee health as a result of negative stress reactions, similar to the imbalance between efforts and rewards. However, this study focusses on the stressor-strain link by analyzing the relationship between PCB and mental and physical health.

Research on work and health has shown that work-related factors play a substantial role in influencing employee health. Both mental health and physical health can be negatively affected by job stressors (for meta-analyses of studies on mental and physical health outcomes, see Stansfeld & Candy, 2006, and Nixon, Mazzola, Bauer, Krueger, & Spector, 2011, respectively). However, since individual health is considered to be a multidimensional concept (Ware, 1987), possible health outcomes vary. Instead of examining specific health problems, such as burnout or physical issues, one approach is to differentiate between a comprehensive understanding of mental health and physical health as measured by basic human values of functioning and emotional well-being across various different groups and times (Ware & Sherbourne, 1992).

The connection between psychological contracts and employee health is a relatively new subject of psychological contract research (for an overview, see Conway & Briner, 2005; Zhao et al., 2007). Existing research has focused mainly on the association between fulfillment and health. Parzefall and Hakanen (2010) found that contract fulfillment is positively related to mental health. Higher levels of fulfillment are also associated with lower levels of emotional exhaustion (Gakovic & Tetrick, 2003). As for physical health, contract fulfillment is associated with less sickness absenteeism and with fewer accidents at work, but not with general health (Clinton & Guest, 2010).

Empirical research on the explicit association of PCB with health outcomes is still rather limited (Gracia et al., 2007). However, breached obligations generally have a stronger effect on employee well-being when compared with fulfilled obligations (Conway, Guest, & Trenberth, 2011; Jong, Clinton, Rigotti, & Bernhard-Oettel, 2015; Rousseau, 1989, 1995) and thus promise to be more predictive of employee health. PCB is associated with reduced psychological well-being (Conway & Briner, 2002a). It also predicts teacher burnout (Topa Cantisano et al., 2007), as well as high levels of soldier burnout during missions (Chambel & Oliveira-Cruz, 2010). Generally speaking, expectations not met by organizations are also associated with burnout (Schaufeli & Enzmann, 1998) and emotional exhaustion (Buunk & Schaufeli, 1999), and broken promises are closely related to emotions of betrayal and hurt (Conway & Briner, 2002a) and to negative emotions such as anger, violation, and depression (Conway & Briner, 2002b). Concerning physical health outcomes, Clinton and Guest (2010) found that unfulfilled obligations predict increased sickness absenteeism and poorer general health. More research on physical health is currently not available. However, because negative psychological stress reactions due to perceived unmet obligations affect physical health as well (Robbins et al., 2012), we suggest that PCB is also likely to be connected to employee physical health.

Thus, in line with ERI we argue that perceived PCB is negatively associated with both mental and physical health, because it is an imbalance in the employment relationship that acts as a psychosocial work stressor and affects employee mental and physical health through negative stress reactions:

Hypothesis 1. PCB is negatively associated with mental health (*H*1a) and physical health (*H*1b).

PCB of Specific Contents

Current research mostly measures PCB either by determining the overall extent to which the organization has fulfilled its obligations or by calculating the average score of a varying number of unmet obligations in the psychological contract (Jong et al., 2015; for a detailed discussion, see Zhao et al., 2007). Since such

comprehensive measures treat all obligations as equally important, they do not take into account the heterogeneity of the workforce and the relevance of different obligations in different work contexts. Moreover, calculations of averages are based on the assumption that fulfilled obligations are as important as breached obligations, and therefore outbalance PCB (Jong et al., 2015). Conway and Briner (2002a) showed that a single breached obligation alone can affect an employee's daily mood. In our study, we provide a more detailed measurement of PCB by examining the relative effect of specific unmet obligations in addition to an overall imbalance of the psychological contract: PCB of good career opportunities, high pay, performance-based pay, continuing advanced training, long-term job security, flexible working hours, job autonomy, an interesting job, a pleasant social atmosphere, and social appreciation. We therefore hypothesize that even when controlling for an overall imbalance in the psychological contract, PCB of specific contents adds to the prediction of employee mental and physical health. However, the negative effects differ among the different specific contents; that means the extent of the negative impact differs depending on which contents are breached.

Hypothesis 2. PCB of specific contents is negatively associated with employee mental and physical health, but the negative effects differ among the different aspects.

Mental and Physical Health

With regard to the multidimensionality of individual health and the rising complexity of employment relationships alluded to earlier, it appears that empirical research should not be limited to the association of PCB with only one health outcome at a time. Rather, different health outcomes must be compared to capture the various aspects of work-related processes that influence employee health. Meta-analyses of studies comparing mental and physical health outcomes suggest that perceptions of unfairness in employment relationships are more strongly associated with emotional strain and psychological conditions than with physical health (Robbins et al., 2012). These results indicate that PCB affects employee health mainly through psychological stress reactions, which are more closely connected to mental health than to physical health. Clinton and Guest (2010) conclude from their research that psychological contracts are much less able to account for variations in physical well-being than for variations in psychological well-being. Also, psychological and psychosocial factors at one's place of work are generally more closely connected to mental than to physical health (Leijten et al., 2015). Therefore, with the results of existing research in mind, we argue that PCB contributes more to the prediction of mental health than of physical health.

Research on work and health has shown, though more generally, that stress in the workplace affects an employee's physical health, with mental health playing a mediating role (Tsai & Thompson, 2015). It is necessary to consider that physical and mental health are reciprocally linked and even when each of these health outcomes is affected directly by perceived unfairness, the two outcomes may also interact dynamically with each other (Robbins et al., 2012). Since it is also known that work-related stress tends to affect mental health initially and physical health in the long run (Burke, Greenglas, & Schwarzer, 1996; Peterson et al., 2008), we argue that not only is physical health directly affected by PCB, but this effect is also mediated by mental health.

Hypothesis 3. PCB contributes to the prediction of mental health more than of physical health.

Hypothesis 4. Mental health mediates the negative relationship between PCB and physical health.

Method

Data and Sample

The empirical analyses are based on a longitudinal linked employer-employee dataset that was collected as part of the study "Interactions between Capabilities in Work and Private Life" (LEEP-B3; for further information see Diewald et al., 2014). The study is composed of an employer survey (at least 500 employees liable to social security) with work organizations from various segments of the economy, an employee survey with employees from these organizations, and an additional partner survey. Areas covered by the employer survey include employee structure, employment policy measures, equal opportunity, work–life balance, and health. Areas covered by the employee survey included occupation, personal life, work-life balance, health, preferences, and satisfaction. The employees who participated in the survey were representative of the employees of large work organizations in Germany, in which about 40 percent of all workers are employed (Destatis, 2014). Interviews were conducted using computer assisted telephone interviews (CATI). To date, two waves of data collection have been completed (T1: April 2012 to July 2013; T2: February 2014 to April 2015). T1 comprised 100 organizations and 6,454 employees and response rate was 29%[1]. Of these, 4,000 employees also participated in the second wave (T2) (response rate for panel respondents = 73.3%). The final sample used for the multivariate analysis included 3,870 panel cases (T1 + T2), compromising 46% women and 54% men. Ninety-two percent were permanent employees. Employees ranged in age from 21 to 53 years (average age = 43) and had an average of 14.2 years of education. Eighty-four percent of the participants worked in West German organizations, 39% reported that they had supervising responsibilities. Respondents worked mainly full-time (on average 39.7 hours per week) and 61% used flexible working hours (see also Table 1).

Measures

Mental and physical health (SF-12). The two outcome variables, "mental health" and "physical health," were measured using the German Socioeconomic Panel version of the SF-12 (see Andersen et al., 2007). This short questionnaire on health-related quality of life consists of twelve items representing the two superordinate dimensions mental health (six items) and physical health (six items). The mental component summary (MCS) and the physical component summary (PCS) scores were generated by conducting a confirmatory factor analysis, $\chi^2(45) = 906.922$, $p < .001$, RMSEA = .069, CFI = .952, TLI = .930; see Appendix, Figure A1) for T1 and T2. In contrast to the conventional computation of the MCS/PCS scales, the factors were allowed to correlate, which reflects the more realistic notion that these two aspects of health may influence each other (Schunck, Sauer, & Valet, 2015; Tucker, Adams, & Wilson, 2014). In accordance with the original approach, both scores were standardized to a sample mean of 50 and a standard deviation of 10, where higher values indicate better health.

Psychological contract breach. PCB was measured in two ways based on a commonly used method for investigating psychological contracts (Conway & Briner, 2009). First, respondents were asked to rate the overall balance between their contribution in the workplace and compensation for their contribution (the overall psychological contract) on a 5-point scale ranging from

[1] Response rates were calculated based on AAPOR (The American Association for Public Opinion Research, 2015).

Table 1
Means, Standard Deviations and Correlations of All Study Variables ($N = 3{,}870$).

	Mean	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	26
1. MCS	50.06	9.92																											
2. PCS	50.09	9.93	0.87*																										
3. PCB: Overall imbalance	0.41	0.49	−0.19*	−0.18*																									
4. PCB: Good career opportunities	0.48	0.50	−0.02*	−0.01	0.13*																								
5. PCB: High pay	0.48	0.50	−0.06*	−0.07*	0.25*	0.22*																							
6. PCB: Performance-based pay	0.54	0.50	−0.03*	−0.02*	0.24*	0.18*	0.28*																						
7. PCB: Continuing advanced training	0.47	0.50	−0.07*	−0.05*	0.18*	0.21*	0.15*	0.14*																					
8. PCB: Long-term job security	0.34	0.47	−0.07*	−0.04*	0.10*	0.10*	0.07*	0.08*	0.13*																				
9. PCB: Flexible working hours	0.35	0.48	−0.06*	−0.07*	0.17*	0.11*	0.17*	0.15*	0.16*	0.10*																			
10. PCB: Job autonomy	0.38	0.49	−0.09*	−0.08*	0.18*	0.11*	0.14*	0.14*	0.14*	0.08*	0.25*																		
11. PCB: An interesting job	0.36	0.48	−0.06*	−0.04*	0.13*	0.18*	0.12*	0.12*	0.20*	0.14*	0.14*	0.20*																	
12. PCB: A pleasant social atmosphere	0.54	0.50	−0.09*	−0.09*	0.22*	0.13*	0.15*	0.16*	0.22*	0.14*	0.19*	0.22*	0.18*																
13. PCB: Social appreciation	0.63	0.48	−0.08*	−0.07*	0.26*	0.21*	0.24*	0.21*	0.23*	0.12*	0.20*	0.22*	0.20*	0.33*															
14. Physical strain	2.50	1.11	−0.20*	−0.22*	0.22*	−0.00	0.11*	0.09*	0.05*	0.03*	0.16*	0.10*	0.02*	0.12*	0.11*														
15. Male	0.54	0.50	0.10*	0.08*	−0.08*	0.05*	0.01*	−0.03*	0.01*	0.04*	−0.06*	−0.04*	0.01	−0.05*	−0.03*	−0.11*													
16. Age (in years)	42.97	8.03	−0.02*	−0.10*	−0.03*	−0.05*	−0.04*	−0.01	−0.05*	−0.09*	−0.03*	−0.04*	−0.05*	−0.00	−0.01*	0.05*	0.01*												
17. Years of education	14.22	2.83	0.10*	0.17*	−0.04*	0.07*	−0.03*	0.00	0.04*	0.03*	−0.07*	−0.01*	0.02*	−0.01	0.04*	−0.19*	0.01	−0.03*											
18. Married or in partnership (1 = yes)	0.85	0.35	0.07*	0.06*	−0.05*	−0.02*	−0.01*	0.01*	−0.03*	−0.04*	0.01*	−0.01*	−0.01	−0.01	−0.02*	−0.03*	0.04*	0.16*	0.05*										
19. Number of children	1.10	1.04	0.04*	0.04*	−0.05*	−0.02*	−0.02*	0.01	−0.03*	−0.04*	−0.02*	−0.03*	−0.01	−0.02*	−0.02*	−0.03*	0.07*	0.25*	0.01*	0.30*									
20. Company in West Germany (1 = yes)	0.84	0.37	0.02*	0.01*	−0.07*	0.02*	−0.06*	−0.01*	−0.02*	−0.04*	−0.03*	−0.02*	−0.05*	−0.02*	−0.04*	−0.07*	0.10*	0.10*	0.02*	0.01	0.12*								
21. Not born in Germany (1 = yes)	0.07	0.26	−0.05*	−0.05*	0.03*	−0.04*	0.03*	0.01	−0.02*	0.02*	−0.00	0.04*	0.04*	−0.01	−0.01	0.05*	−0.02*	−0.05*	−0.03*	0.02*	0.07*	0.08*							
22. Earnings (log,)	8.09	0.58	0.15*	0.15*	−0.18*	0.05*	−0.09*	−0.04*	−0.01	0.03*	−0.07*	−0.03*	−0.02*	−0.02*	−0.03*	−0.12*	0.45*	0.20*	0.34*	0.10*	0.04*	0.13*	−0.05*						
23. Actual working hours	39.69	9.65	0.06*	0.05*	0.01	0.07*	0.07*	0.04*	0.04*	0.03*	−0.00	0.03*	−0.02*	−0.01	0.02*	0.08*	0.42*	−0.05*	0.10*	−0.03*	−0.14*	−0.08*	−0.00	0.60*					
24. Temporary Contract (1 = yes)	0.08	0.27	0.00	0.05*	0.02*	−0.02*	−0.06*	−0.00	0.01	0.25*	−0.03*	−0.03*	0.01	−0.03*	−0.03*	−0.02*	−0.08*	−0.23*	0.09*	−0.08*	−0.08*	−0.06*	0.03*	−0.11*	−0.02*				
25. Use of flexible working hours (1 = yes)	0.61	0.49	0.06*	0.07*	−0.14*	0.04*	−0.04*	−0.06*	−0.03*	0.01	−0.19*	−0.07*	−0.00	−0.06*	−0.02*	−0.20*	0.08*	0.05*	0.23*	0.04*	0.042*	0.06*	−0.07*	0.20*	0.018*	−0.03*			
26. Supervising responsibilities (1 = yes)	0.39	0.49	0.06*	0.05*	−0.01	0.01	0.03*	0.04*	−0.04*	−0.06*	−0.01	−0.00	−0.07*	0.01	−0.01*	0.04*	0.17*	0.10*	0.10*	0.09*	0.07*	0.06*	−0.02*	0.30*	0.30*	−0.05*	0.00		
27. Second Job (1 = yes)	0.14	0.35	0.02*	−0.01	0.05*	0.01	0.03*	0.02*	0.02*	−0.03*	0.01*	0.03*	−0.00	0.00	0.02*	0.02*	−0.01	−0.02*	0.03*	−0.01	0.00	0.04*	0.00	−0.05*	−0.04*	0.04*	−0.05*	0.07*	0.07*

Note. MCS/PCS = mental/physical component summary scores; PCB = psychological contract breach.
* $p < .05$ (Pearson correlation coefficients).

1 = *absolutely imbalanced* to 5 = *absolutely balanced*. Second, PCB of specific contents of the psychological contract was measured for various characteristics: good career opportunities, high pay, performance-based pay, continuing advanced training, long-term job security, an interesting job, job autonomy, flexible working hours, a pleasant social atmosphere, and social appreciation. Respondents were asked to rate, again using a 5-point scale, the extent to which they expected their employers to provide these characteristics. They were then asked to use the same 5-point scale to rate the extent to which their employers actually provided these characteristics. PCB was calculated as the difference between expectation and delivery (1 = breach). A breach of the psychological contract was considered to have occurred if what was provided was less than what the employees had expected (Morrison & Robinson, 1997; Robinson & Rousseau, 1994).

Employment context. Main characteristics with regard to job and occupation were included. We included actual working hours, use of flexible working hours (1 = yes), temporary vs. permanent contract (1 = temporary), and supervisory responsibilities (1 = yes). In addition, the respondents were asked how often they had to go to the limits of their physical capacity at work (1 = always; often) and if they had a second job (1 = yes). Earnings were measured as the log of monthly net earnings (in €).

Sociodemographic and control variables. We controlled for gender (1 = male), age (in years), years of education (metric), migration background (1 = not born in Germany), partnership status (1 = married or in a partnership), and number of children (metric). All these variables have been recognized as predicting variations in health and have to be considered because of possible selection effects.

Data Analysis

All multivariate models were computed via structural equation modeling in Stata 14 (SEM package). Two dependent variables (MCS and PCS) were used in models M1 and M2. To address the issue of reverse causality, we used two waves of panel data for the analysis. All dependent and independent variables were measured at both T1 (2012) and T2 (2014). The independent variables were used from T1, and the health outcomes were used from T2. The measures of PCB were introduced stepwise to the regression analysis to assess their respective explanatory power. This was done by including all independent variables in both stepwise regression models but in M1 the PCB of specific contents variables were constrained to 0. In M2 these variables are then allowed to correlate with the dependent variables. The resulting differences in these nested models were tested for significance with a likelihood-ratio test.

Because of the restrictions imposed by two time points, the mediator in the mediation analysis (model M3, see section 4.2) was measured at the same time as the other independent variables (T1, see Figure 1). This specification ensured the causal ordering and time requirement of the relevant link in the mediation process (mental health influencing physical health). A given indicator may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the dependent variable (Baron & Kenny, 1986). Thus, mediation analysis tests for the direct, indirect, and total effects of PCB on PCS. To test the indirect effects, Preacher and Kelley (2011) suggest reporting the individual coefficients, the confidence intervals for population effect sizes, and how those were estimated (see Preacher & Kelley, 2011, p. 109). We control the confidence intervals for the indirect effects by computing bias-corrected bootstrap estimates on 1,000 bootstrap samples (see MacKinnon, Lockwood, & Williams, 2004) and also report the ratio of the indirect effects to the total effects according to Wen and Fan (2015, p. 199).

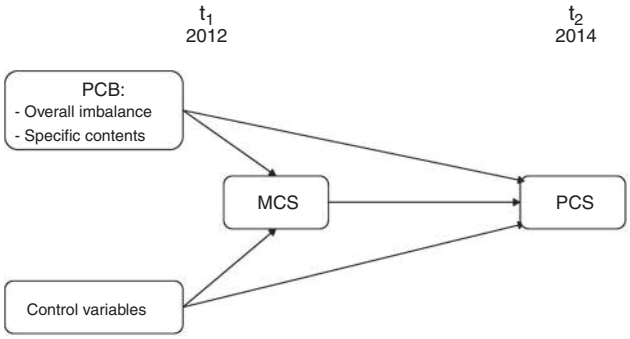

Figure 1. Analytical overview PCB and health.

Because the dependent variables MCS and PCS are already standardized, unstandardized coefficients were used to make the interpretation of results more plausible.

Results

Table 1 shows the means, standard deviations, and correlations of all study variables. In general, PCB occurred frequently: 95 percent of employees in the sample reported PCB at least once among the specific contents. The descriptive results showed that the expectation of "social appreciation" was the content of the psychological contract which was breached most often, followed by "performance-based pay" and "a pleasant social atmosphere." In contrast, "flexible working hours" and "long-term job security" were the contents breached least often. This can be explained easily, because 92 percent of the respondents had a permanent contract and 98 percent of the companies offered flexible working hours. Correlations of the PCB variables were mostly around .1 and .2, which is relatively low, leading to the conclusion that no multicollinearity will influence the results. We additionally tested for multicollinearity using the variance inflation factor (VIF) for the independent variables. Since VIF is < 10 for all variables (mean VIF = 1.5, VIF < 2.5 for all variables) this test supports the conclusion that the coefficient estimates are not influenced by multicollinearity (Wooldridge, 2013).

Table 2 shows the results of the multivariate models for MCS and PCS. Model 1 includes the overall measure of PCB, as well as all other variables concerning employment background and sociodemographic background. The model is able to explain 9.7 percent and 11.9 percent of the individual variance on the mental health and physical health scales, respectively. Results show a statistically significant negative effect of the overall imbalance of the psychological contract on both mental health and physical health, that is, employees who perceive an overall imbalance have poorer mental and physical health, a finding that supports hypotheses *H*1a and *H*1b. However, the effect is slightly stronger for MCS ($\beta = -2.767$, $p < .001$) than for PCS ($\beta = -2.460$, $p < .001$), which supports hypothesis *H*3.

Model 2 estimates the breaches of specific contents of psychological contracts. PCB of the expectation of long-term job security has a significant negative effect on both mental and physical health, although the effect is stronger for MCS. The mental health score is 1.054 points ($p < .01$) lower if an employee perceives the psychological contract to be breached concerning the obligation of providing long-term job security. In comparison, PCS is 0.849 points ($p < .05$) lower if PCB of this content occurs. PCB of performance-based pay and job autonomy also have significantly negative effects on both health dimensions. In comparison, PCB of long-term job security has the strongest negative effect on both health dimensions compared to all other PCB of specific contents. That the

Table 2
Structural Equation Models (N = 3,870).

	M1: Overall Imbalance				M2: Overall Imbalance + Specific Contents			
	MCS		PCS		MCS		PCS	
	Coeff.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
PCB: Overall imbalance	−2.767***	(0.327)	−2.460***	(0.323)	−2.418***	(0.350)	−2.167***	(0.346)
PCB: Specific contents								
Good career opportunities					−0.067	(0.330)	0.002	(0.327)
High pay					0.078	(0.342)	−0.109	(0.337)
Performance-based pay					0.724*	(0.333)	0.710*	(0.330)
Continuing advanced training					−0.488	(0.329)	−0.273	(0.325)
Long-term job security					−1.054**	(0.347)	−0.849*	(0.342)
Flexible working hours					0.108	(0.349)	−0.066	(0.345)
Job autonomy					−0.766*	(0.338)	−0.767*	(0.334)
An interesting job					−0.388	(0.341)	−0.096	(0.337)
A pleasant social atmosphere					−0.496	(0.338)	−0.575	(0.334)
Social appreciation					−0.236	(0.359)	−0.123	(0.356)
Actual working hours	0.003	(0.023)	−0.014	(0.022)	−0.003	(0.023)	−0.018	(0.022)
Temporary Contract (1 = yes)	0.303	(0.585)	1.335*	(0.578)	0.667	(0.608)	1.586**	(0.601)
Use of flexible working hours (1 = yes)	−0.430	(0.334)	−0.420	(0.330)	−0.417	(0.337)	−0.434	(0.333)
Supervising responsibilities (1 = yes)	0.715*	(0.339)	0.613	(0.334)	0.561	(0.339)	0.514	(0.335)
Second Job (1 = yes)	−0.195	(0.448)	−0.084	(0.442)	−0.228	(0.446)	−0.106	(0.441)
Physical strain	−1.365***	(0.142)	−1.414***	(0.147)	−1.316***	(0.149)	−1.359***	(0.148)
Earnings (log)	1.319**	(0.419)	1.676***	(0.414)	1.525***	(0.422)	1.833***	(0.417)
Male	0.471	(0.363)	0.225	(0.359)	0.519	(0.363)	0.243	(0.359)
Age (in years)	−0.059**	(0.021)	−0.151***	(0.021)	−0.066**	(0.021)	−0.157***	(0.021)
Years of education	0.133*	(0.061)	0.319***	(0.061)	0.138*	(0.061)	0.320***	(0.061)
Not born in Germany (1 = yes)	−1.348*	(0.590)	−1.448*	(0.583)	−1.279*	(0.590)	−1.391*	(0.584)
Married or in partnership (1 = yes)	1.256**	(0.457)	1.353**	(0.452)	1.208**	(0.456)	1.319**	(0.450)
Number of children	0.238	(0.161)	0.371*	(0.159)	0.221	(0.161)	0.355*	(0.159)
Company in West Germany (1 = yes)	−0.185	(0.460)	−0.238	(0.456)	−0.290	(0.460)	−0.320	(0.457)
Constant	43.089***	(2.686)	42.784***	(2.703)	44.307***	(2.539)	43.562***	(2.509)
R^2	0.097		.119		0.106		.125	
Cov(e.mcs14, e.pcs14)	76.5334***	(1.889)			75.854***	(1.874)		

Note. MCS/PCS = mental/physical component summary scores; PCB = psychological contract breach; Unstandardized coefficients; Predictor variables were measured at T1 (2012), MCS/PCS were measured at T2 (2014).
* $p < .05$, ** $p < .01$, *** $p < .001$.

model also considers breach of specific obligations adds slightly to the explained variance in MCS and PCS (R^2 10.6% and 12.5%, respectively). The differences in the explained variances are statistically significant (likelihood-ratio test, $p = .004$), confirming that there is a significant increase in the explanatory power of the model if the PCB of specific contents variables are added to the prediction. Therefore, even though the change in R^2 is comparatively low between M1 and M2 (.9 points for MCS and .6 points for PCS), these results indicate that breach of specific contents significantly adds to the explanation of health outcomes. PCB of specific contents predicts poorer mental and physical health of employees, but the relevance for the prediction varies among the different contents, supporting hypothesis *H*2. The negative effect of an overall imbalance is decreased slightly by adding breach of specific contents of psychological contracts but is still highly significant for MCS and PCS and relatively higher for MCS. The overall imbalance has the greatest effect, as compared with single breaches.

With regard to the other job and employment variables, the results show that having a temporary contract rather than a permanent one is related to better physical health but does not significantly affect mental health. Physical strain at work affects both mental and physical health negatively. Surprisingly, the effects on MCS and on PCS are similarly high. In contrast, high earnings are positively related to MCS and PCS.

Taken together, Models M1 and M2 are better able to explain differences in PCS than in MCS, which supports Hypothesis *H*3. However, including the specific contents of psychological contracts in the model increased the explained variance (R^2) slightly but more for MCS.

To test the mediation hypothesis (Hypothesis 4), unstandardized direct, indirect and total effects[2] of job demands and resources on MCS were predicted in the mediation model M3, as presented in Table 3. The results show that PCB, measured as the overall imbalance of the psychological contract, has a total effect of β = −2.167 on physical health ($p < .001$). Although the direct effect of the overall imbalance on PCS accounts for 64% of the total effect (β = −1.390, $p < .001$), which is also the only significant direct effect, a notable share of 36% (β = −0.777, $p < .000$) is significantly explained by the indirect effect through MCS. This finding supports Hypothesis *H*4, stating that the relationship of PCB and physical health is partly mediated by mental health. Considering this mediation reveals that PCB of the specific contents job autonomy, flexible working hours, a pleasant social atmosphere, and social appreciation negatively affect MCS, whereas they have indirect negative effects on physical health. The indirect effect PCB of job autonomy significantly accounts for 41% (β = −0.316, $p < .05$) of the total effect (β = −0.767, $p < .05$), long-term job security for 65% (β = −0.557, $p < .000$) of the total effect (β = −0.851, $p < .000$). All in all, the results support the hypotheses that not only is PCB directly related to physical health but it also influences physical health indirectly through its effect on mental health (*H*1 and *H*4).

[2] Additionally estimated bias-corrected confidence intervals lead to the same conclusions (95% confidence interval for indirect effect of overall imbalance on PCS = −1.063 to −0.490; full estimates see Appendix, Table A2).

Table 3
Structural Equation Models. Mediated Model M3 ($N = 3{,}870$).

	MCS		PCS	
	Coeff.	Std. Err.	Coeff.	Std. Err.
Direct				
PCB: Overall Imbalance	−1.857***	(0.343)	−1.390***	(0.316)
PCB: Specific contents				
Good career opportunities	−0.142	(0.324)	0.061	(0.298)
High pay	−0.091	(0.334)	−0.072	(0.307)
Performance-based pay	0.614	(0.327)	0.453	(0.300)
Continuing advanced training	−0.496	(0.323)	−0.065	(0.296)
Long-term job security	−1.332***	(0.340)	−0.294	(0.312)
Flexible working hours	−0.685*	(0.342)	0.219	(0.314)
Job autonomy	−0.756*	(0.331)	−0.451	(0.304)
An interesting job	−0.350	(0.334)	0.051	(0.307)
A pleasant social atmosphere	−1.135**	(0.332)	−0.101	(0.305)
Social appreciation	−1.082**	(0.352)	0.333	(0.324)
MCS			0.418***	(0.015)
Indirect				
PCB: Overall Imbalance			−0.777***	(0.146)
PCB: Specific contents				
Good career opportunities			−0.059	(0.136)
High pay			−0.038	(0.140)
Performance-based pay			0.257	(0.137)
Continuing advanced training			−0.208	(0.135)
Long-term job security			−0.557***	(0.144)
Flexible working hours			−0.286*	(0.144)
Job autonomy			−0.316*	(0.139)
An interesting job			−0.146	(0.140)
A pleasant social atmosphere			−0.475**	(0.140)
Social appreciation			−0.453**	(0.148)
Total				
PCB: Overall Imbalance			−2.167***	(0.346)
PCB: Specific contents				
Good career opportunities			0.002	(0.327)
High pay			−0.110	(0.337)
Performance-based pay			0.710*	(0.330)
Continuing advanced training			−0.273	(0.325)
Long-term job security			−0.851*	(0.342)
Flexible working hours			−0.068	(0.345)
Job autonomy			−0.767*	(0.334)
An interesting job			−0.096	(0.337)
A pleasant social atmosphere			−0.576	(0.334)
Social appreciation			−0.120	(0.356)
MCS			0.418***	(0.015)
R^2	0.141		0.276	

Note. MCS/PCS = mental/physical component summary scores; PCB = psychological contract breach; unstandardized coefficients; all control variables are included in the model but are not displayed here; for MCS, total effects are identical to direct effects; predictor variables were measured at T1 (2012), MCS/PCS were measured at T2 (2014).
* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

In our study, we investigated the relationship between PCB and employee mental and physical health in a large sample of employees from a broad range of workforce structures and industries. In doing so, we overcame the limitations of previous research that was mostly cross-sectional and used small, highly specific samples that did not allow conclusions about causality and could not be generalized to broader employee groups (Conway & Briner, 2005, 2009). Our main aims were to compare the effects of PCB on mental and physical health and to examine how mental health mediates the effects of PCB on physical health. In addition, we considered the relative importance of PCB of specific obligations in order to determine how the association of PCB with employee health differs according to the breach of different contents of psychological contracts. Our results support the idea that PCB can be understood as an imbalance in the employment relationship, in line with the effort–reward imbalance framework (Siegrist, 1996), that acts as a psychosocial work stressor that is associated with impaired employee health due to negative emotional states and perceived stress.

The results showed that PCB affects both the mental and the physical health of employees. Even though there is little empirical research on the explicit relationship between PCB and employee health (e.g., Gracia et al., 2007), some studies have shown that experiencing unmet obligations within psychological contracts is negatively related to various mental health outcomes (Conway & Briner, 2002a, 2002b; Topa Cantisano et al., 2007). Existing research concerning the mechanisms which affect different health outcomes is scarce (Clinton & Guest, 2010; Robbins et al., 2012), but mainly finds effects on mental health. Our study supports these claims by finding significant adverse health effects. Results showed that PCB is not only associated with poorer mental health, but is also predictive of employees' physical health, though PCB is more likely to lead to differences in mental health than to differences in physical health. This finding provides evidence to support the notion that PCB affects employee health mainly through psychological stress reactions, which are more closely connected to mental health than to physical health outcomes. However, this study has focused on the link between PCB and employee health only and was not able to consider the nature of the stress reaction in depth, mainly due to the lack of appropriate data. Thus, further research is needed to analyze how PCB particularly causes stress reactions that then lead to impaired employee health to better understand the underlying processes between unmet expectations and mental and physical health.

This is also the first empirical study that shows that mental health partly mediates the relationship between PCB and physical health, which has important implications for explaining employee physical health. By design, all contents of psychological contracts are evaluated cognitively at first; physical (i.e., somatic) reactions follow as breaches are interpreted as harmful stressors. If only the direct effects of PCB on physical health outcomes are considered, the results will be blurred because this mediating effect of mental health is neglected. Conversely, by examining only mental health outcomes, which has been the predominant approach in the literature, one neglects the (long-term) effects on physical health. In addition, our study has shown that, compared with other workplace characteristics, an overall imbalance of expectations and perceived fulfillment of these expectations represents the main predictive effect on both mental and physical health.

Our results also reveal the importance of assessing PCB in a more detailed way rather than simply using comprehensive measures (Jong et al., 2015), not only for methodological reasons but also because of practical relevance. In fact, we found differences between breaches of specific obligations. Some contents (e.g., long-term job security, job autonomy) proved to be important for both mental and physical health; some obligations were directly related to mental health and only indirectly related to physical health (e.g., a pleasant social atmosphere, social appreciation), whereas others showed no relationship at all with employee health. In comparison, PCB of long-term job security had the strongest negative effect on both mental and physical health, which is especially noteworthy as 92% of the participants were employed in permanent jobs. Further analysis revealed that this effect is significant only for permanent employees, not for non-permanent employees. This may be explained by the fact that even a permanent contract does not protect against job loss due to restructuring or closure of the organization. This finding emphasizes the crucial role of the subjective evaluation of the employee-employer relationship: the written contract may state the permanence of the employment, but the psychological contract takes into account the general economic climate, the state of the industrial sector, characteristics

of the specific location and even (irrational) fears of the individual. Accordingly, PCB was most harmful for employee health if those contents were unmet that are usually not included in written employment contracts, which was also the case for job autonomy, social appreciation and a pleasant social atmosphere. This conclusion is in line with the theoretical assumption that employees use psychological contracts to fill in the gaps of standard employment contracts to reduce individual uncertainty about the work environment and employment conditions (Rousseau, 1995; Shore & Tetrick, 1994). Thus, future research on occupational health should intensify investigating this kind of psychosocial work stressor, particularly against the background of increased heterogeneity of employment relationships due to changes in the work context and in employees themselves (Guest, 2016). However, the obvious differences in the effects of PCB of various contents clearly raise doubts about the prevailing use of comprehensive measures of PCB, which is based on the assumption that all contents are equally important. The particularly health impairing effects of PCB of social aspects (e.g., appreciation and atmosphere) highlight the crucial role of organizational climate and social support at the workplace. If employees' health is specifically threatened by breaches of those contents that are not included in written agreements, the employer-employee relationship itself becomes more important. Thus, to understand which unmet expectations are particularly relevant for employee health, it is important that future research assesses PCB in a more detailed manner than is mostly done.

However, the analyses also showed that the overall imbalance of the psychological contract had the strongest negative effect, relatively speaking, on employee health, as compared with PCB of specific obligations. This result indicates that psychological contracts consist of much more than just the sum of their individual contents and, in fact, demonstrates how complex employment relationships, and specifically psychological contracts, can be and how important it is to consider more detailed approaches to explain differences in employee health. Finally, it must not be neglected that the large majority of employees (95%) within the sample experience PCB of one or more obligations, which supports previous empirical studies (Conway & Briner, 2002b; Coyle-Shapiro & Kessler, 2000; Robinson & Rousseau, 1994). If PCB occurs this often, the potential risk for employee health should not be underestimated.

Limitations

This study has its limitations. First, we were able to test the breach of only 10 different specific contents of psychological contracts owing to data limitations. Even though these contents were chosen based on their relevance in former research, we necessarily and systematically left out other possible obligations. Further research is needed to investigate less precise obligations, such as relationships to supervisors and coworkers or expectations regarding work–family balance. Second, the sample consisted mostly of employees with a permanent contract, which is still typical of large companies in Germany (Eichhorst & Tobsch, 2014). Research has indeed shown that the psychological contracts of permanent and temporary employees differ (Conway & Briner, 2002b). Third, the linked employer-employee study involved large companies only. The structure of psychological contracts may be quite different in smaller companies, where employer-employee relationships are much more direct. However, to appropriately analyze the effect of PCB on employee health, a broad workforce structure, with various occupations and educational and income groups, will be needed that is often not available in smaller companies. Fourth, even though data from two waves made it possible to consider issues of reverse causality, the relationship of PCB and employee health should be investigated with more longitudinal data.

Conclusion and Practical Implications

In conclusion, the results of this study support the idea that PCB works as a psychosocial stressor at work that represents a crucial risk to employee health. Based on the results, this study offers some practical advice. Ill health of employees represents an important cost for organisations (Goetzel et al., 2004). Therefore, employee health promotion is increasingly considered among human resource managers (see e.g., Cancelliere, Cassidy, Ammendolia, & Cote, 2011). For human resource management our results indicate that it is necessary to look not only at the tangible demands at work, but also at the subjective perception of the employment relationship and the psychological contract. To promote employee health, psychological contracts could be a promising starting point for intervention. As previous research has shown, effective employer-employee communication is crucial in fulfilling psychological contracts (Herriot & Pemberton, 1997; Turnley & Feldman, 1999), so, clearly and periodically communicating reciprocal expectations on both sides of the employment relationship appears to be crucial. This can already be considered in job advertisements by giving detailed information on what the employer is willing to provide, not only regarding pay or career prospects but also with respect to support and social aspects. This could be continued in the initial job interview and in periodic individual discussions concerning objectives and goals to explore the individual employer-employee expectations fit. By achieving a better fit of employer-employee expectations, and thus a more effective psychological contract, breach of psychological contracts may be reduced right from the start to prevent negative health implications.

Conflict of Interest

The authors of this article declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.rpto.2016.11.001.

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