Perceived Job Insecurity and Self-Rated Health: Testing Reciprocal Relationships in a Five-Wave Study

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Abstract

Rationale

The present study aimed to investigate the pattern of cross-lagged relationships between job insecurity and self-rated health over a period of four years. While health complaints are usually seen as one of the detrimental outcomes of job insecurity, the question of the direction of the job insecurity-health relationship has not yet been fully resolved. Only a few longitudinal studies have explicitly aimed to test the possibility of reciprocal or reverse effects, and even fewer studies have used multi-wave designs to examine the pattern of these relationships.

Objective

The current study aims to address this gap by testing how cross-lagged relationships between job insecurity and self-rated health status unfold over time.

Method

The study was conducted on a sample of Swiss working population ($N = 928$), using the data from five consecutive measurement occasions, each separated by a one-year lag. Cross-lagged structural equation modelling was performed to examine the direction of the effects.

Results

The results revealed an interchangeable direction of the relationship between job insecurity and health over time. T1 job insecurity predicted lower ratings of health at T2, which then predicted job insecurity at T3, which, in turn, was related to lower health at T4. The only exception was observed in the last follow-up (i.e., T4 to T5), where no evidence of cross-lagged relationships between job insecurity and self-rated health was found.

Conclusion

These findings contribute to the literature suggesting that not only job insecurity may predict later health impairment, but that in some cases the reverse may be possible too. This is an important message that needs to be taken into account by researchers and policy makers. The observed lagged reciprocal effects between job insecurity and health seem to form a negative cycle over time, thereby implying a dual process in the development of workplace vulnerabilities.

Keywords: Job insecurity; self-rated health; negative cycle; workplace vulnerabilities; cross-lagged panel model

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1. Introduction

Job insecurity is a classic workplace stressor (De Witte, 1999) that has received increasing attention from occupational health researchers in recent decades. Given the precarity of the labour market and the changing nature of modern organizations, it remains one of the main concerns when developing a healthy and a more employee well-being oriented workplace.

Job insecurity can be defined either in subjective or objective terms. Perceived job insecurity refers to the subjectively experienced threat of losing one's employment and the worries related to that threat (De Witte, 2005; Sverke, Hellgren, & Näswall, 2002), whereas objective job insecurity denotes an objectively insecure occupational situation, such as the restructuring of the firm, outsourcing, foreseen layoffs, temporary contracts, and the like (Bartley & Ferrie, 2001). In the present study, we focus on perceived job insecurity. One reason for that is that employees usually translate the possibility of job loss into subjective terms (Klandermans & Van Vuuren, 1999). While objective situational characteristics are not the only source of subjective job insecurity, they are important antecedents of job insecurity perceptions (Keim, Landis, Pierce, & Earnest, 2014). Moreover, perceived job insecurity may better capture interpersonal variations in the intensity of experienced insecurity and therefore can be considered as a more potent stressor than the objectively precarious work characteristics (Ferrie, 2001).

Our main goal was to test the direction of the cross-lagged relationships between perceived job insecurity and self-rated health. Cross-lagged effects refer to the effect of one construct on another measured at a later time (Selig & Little, 2012) and are particularly

relevant in investigating the outcomes or predictors of job insecurity. While the health damaging effect of job insecurity has received considerable attention (see De Witte, Pienaar, & De Cuyper, 2016; László et al., 2010; Ruckert & Labonté, 2017; Virtanen, Janlert, & Hammarström, 2011), there are several gaps in the knowledge regarding the relationship between job insecurity and health. First, although seemingly more evidence exists regarding the path from job insecurity to health, many studies have *aimed* primarily at investigating this direction of the relationship. Health has been often tested as the outcome of job insecurity rather than vice versa, thus not giving proper attention to the possibility of the reverse pathway (i.e., from health to job insecurity). The complexity of the effects of job insecurity also asks for more attention to the potential endogeneity issue, which means that the experience of job insecurity may be affected either by initial health status or by third variables (see Caroli & Godard, 2016). Hence, a more thorough investigation of the direction of the cross-lagged effects would clearly add to the existing literature.

Second, research on job insecurity and health would benefit from a deeper theoretical underpinning. As noted in a recent overview by De Witte et al. (2016), some of the studies conducted to date still rely on the oversimplified argument that job insecurity is a stressor that causes adverse effects on health. While intuitively (and perhaps practically) such an argument makes sense, it does not account for the complexity of the experience of job insecurity, nor is it fully justified from a theoretical perspective. Psychological theories of stress have much more to offer in explaining the experience of job insecurity and deserve a more detailed account.

To address the abovementioned gaps, the present study draws on the appraisal framework (Lazarus & Folkman, 1984) and conservation of resources theory (COR; Hobfoll, 1989). By combining these two well-tested theories, we aim to gain a better understanding of

the underlying patterns linking job insecurity and self-rated health and discuss the psychological mechanisms that may be involved in these relationships.

2. Theoretical and Empirical Background

The appraisal framework (Lazarus & Folkman, 1984) and COR theory (Hobfoll, 1989) are of particular relevance when investigating the interrelationship between job insecurity and self-rated health, as they complement each other in explaining the potential antecedents and outcomes of job insecurity. The appraisal theory underscores the subjective interpretation of a stressor or threat in the environment and the consequences thereof. According to Lazarus and Folkman (1984), a two-stage cognitive appraisal process can explain individual differences in the reaction to stressful situations. *Primary* appraisal refers to the evaluation of how harmful the situation is, whereas *secondary* appraisal includes the evaluation of resources that are at one's disposal to cope with the situation. If the situation is perceived as threatening and the individual does not possess sufficient coping resources, it elicits a stress response that may have long-term detrimental effects on physical health and psychological well-being (Lazarus, DeLongis, Folkman, & Gruen, 1985). Such stressor-strain reasoning has been widely used in job insecurity studies, usually implying that job insecurity is detrimental because it is a severe work stressor followed by the employee's powerlessness to change the situation (see De Witte et al., 2016 for an overview). Consistent with this, a number of longitudinal studies have found that job insecurity predicts later health impairment, including self-rated health (Burgard, Kalousova, & Seefeldt, 2012; László et al., 2010), the manifestation of various physical symptoms (Ferrie et al., 2013), and mental health complaints (Ferrie, Shipley, Newman, Stansfeld, & Marmot, 2005; Rugulies, Bültmann, Aust, & Burr, 2006; see also De Witte et al., 2016). This is also true for broader work-related precarity, such as discontinuous career trajectories, that include aspects of job insecurity (Giudici & Morselli, 2019). It is, however, notable that the appraisal theory does not imply a strictly unidirectional link

between the experience of stress and physical or mental states. Lazarus et al. (1985) emphasize that their stress model is *recursive*, illustrating a negative cycle that can start at any point. Specifically, a negative cycle refers to two or more variables building on each other and thus predicting each other over time. In the case of job insecurity, this implies that employees with pre-existing health complaints already are in a much more vulnerable situation than their healthy counterparts. Health status is considered a significant factor in labour force participation (e.g., Cai, 2010; Cai & Calb, 2005; Schuring et al., 2013). Hence, due to their health situation, such individuals may perceive themselves to be more at risk of being laid-off in the event of organizational restructuring and may have fewer opportunities to find other employment. In statistical terms, this implies a reciprocal or even reverse relationship between job insecurity and self-rated health, where health status predicts later job insecurity because such employees are more likely to experience job insecurity as a threat.

COR theory (Hobfoll, 1989) complements the appraisal theory by adding yet another perspective to the explanation of the relationship between job insecurity and self-rated health. From the COR theory perspective, both job security and health would be considered valuable resources that the individual aims to maintain and protect. Generally, individuals with more resources are better positioned for further resource gains, because resources tend to build on each other, thus resulting in a positive gain cycle (Hobfoll, 2001; see also Halbesleben, Neveu, Paustian-Underdahl, & Westman, 2014). For instance, job security may have a positive impact on health, which, in turn, strengthens one's (perceived) possibilities of maintaining a secure position in the labour market. In contrast, adverse conditions that imply a threat to certain resources trigger a resource depletion process whereby the other available resources are consumed to protect the valued status quo. This results in the loss of resources, which subsequently increases vulnerability and strain. This process is known as the loss spiral (Hobfoll, 2001). In the case of job-insecure situations, one may infer that coping with job

insecurity consumes health resources, and once affected, they weaken the (perceived) job security. In this way, COR theory poses an important additional implication that not only reciprocal effects may exist between job insecurity and health status but that these effects may develop into a certain cyclical pattern over time.

This implication has been rarely tested to date, and the existing empirical evidence is somewhat mixed. In their overview of longitudinal studies, De Witte et al. (2016) report a few instances when initial health status was found to predict later job insecurity (e.g., Ibrahim et al., 2009). However, given the small number of studies that have been interested in a reverse pathway, the question regarding the direction of the effects remains unresolved. For instance, drawing on the assumptions of COR theory, De Cuyper et al. (2012) have demonstrated that job insecurity and exhaustion may be related in a reciprocal way, thus creating a negative cycle. The reciprocity issue has also been revived by recent empirical evidence on job insecurity and depressive symptoms. For example, in their five-year longitudinal study, Vander Elst et al. (2017) found that highly insecure employees were more likely to become depressed, which, in turn, increased their chances at a later point to experience high job insecurity. Since theoretical arguments regarding the detrimental effects of job insecurity on mental and physical health are quite similar, one may expect the reciprocal pattern to be present in the relationship between job insecurity and self-rated physical health as well.

3. Present Study

The present study aims to elaborate on the abovementioned aspects regarding job insecurity and health. It seeks to give a full account of the potentially bi-directional nature of the relationship between job insecurity and self-rated health testing their cross-lagged associations across five yearly measurement points. Despite quite prolific research on the detrimental effects of job insecurity, there is still a need for further research regarding how workplace vulnerabilities develop over time. While health impairment is a potentially severe

negative outcome of job insecurity, it may equally represent an initial condition that places employees in a more vulnerable situation that makes them to be more likely to end up in job-insecure situations. This aspect is not fully clarified in the literature, and as such, it would benefit from further investigation. To this end, we raise two research objectives in the present study. Our first research objective is to test reciprocal cross-lagged relationships between job insecurity and self-rated health status over a period of four years to provide us with information on the direction and consistency of the temporal effects of job insecurity on self-rated health, and vice versa. Subsequently, a second research objective is to investigate the possibility of a negative cycle in the pattern of the cross-lagged relationships between job insecurity and health. In theory (e.g., Hobfoll, 2001), a negative cycle refers to the situation where a lack of one resource (e.g., job security or health status) eventually leads to the depletion of the other, which then increases the likelihood of further reciprocal resource loss over time. While such cyclical effects have been addressed in some studies (e.g., De Cuyper et al., 2012), testing them on multi-wave data is rare and would provide additional insight into the occurrence of these effects.

4. Method

4.1. Procedure

The present study is based on a longitudinal "Professional Paths" survey conducted at the Swiss National Centre of Competence in Research—Overcoming Vulnerabilities: Life Course Perspectives (LIVES). The participants of this survey were recruited from a representative adult sample drawn from the national register of inhabitants and provided by the Swiss Federal Statistics Office (SFSO). At each occasion, potential participants received a letter inviting them to complete the survey. The data were collected anonymously, with a six digit code identifying each participant. At the end of the survey, participants received a

compensation of 20 CHF. They could choose to either donate this amount to a non-profit organization or receive a gift card in this amount.

4.2. Sample

The data from five yearly measurement occasions collected from 2012 to 2016 (i.e., there was a one-year lag between the measurements) were used in the present study. The final sample consisted of 928 employed adults, such as salaried enterprise employees, employees working in family firms and independent workers, including self-employed individuals (51.2% female; mean age at T1 = 43.06, *SD* = 8.10). This sample is roughly representative of the German- and French-speaking Swiss population in terms of age, gender, and linguistic region.

Selection criteria. To be included in the sample, participants had to have participated in at least four of the five waves of the study. We allowed for a maximum of one wave non-participation to retain the sample size as large as possible. Furthermore, a criterion of being professionally active was used when composing the final sample. Only data from participants who held a remunerated employment contract in all measurements occasions could be analysed because job insecurity items do not apply to unemployed individuals.

Sample attrition. At the beginning of the study, the initial valid sample consisted of 1895 employed adults (51% female; mean age 41.98, *SD* = 8.61) with an average yearly dropout rate of 20%. Allowing for one wave non-participation, the valid sample size included 928 subjects (i.e., approximately half the initial sample size). We compared the dropout and the final sample with regard to the socio-demographic composition and found no significant differences between the distribution of participants with respect to gender or linguistic region. However, the dropout sample was slightly younger in age, with a mean difference of 2.12 years ($p < .001$), and reported higher mean levels of job insecurity, with a mean difference of

0.14 on a four-point scale (p <.001), and lower self-rated health, with a mean difference of -0.08 on a five-point scale (p = .015) as measured at T1.

4.3. Measures

Job insecurity. Job insecurity was measured using three items specifically designed for this study. The items reflect important aspects of job insecurity as suggested by most influential job insecurity models and measures (e.g., Borg & Elizur, 1992; Hellgren, Sverke, & Issakson, 1999; Probst, 2003). The first item measures the satisfaction with job security (1—*very satisfied* to 4—*very dissatisfied*); the second item assesses the fear of job loss in the upcoming 12 months (1—*do not fear it at all* to 4—*highly fear it*); and the third item refers to a subjective estimation of the probability of keeping or losing one's job (1—*totally agree* to 4—*totally disagree*). The reliability of the scale, as determined by Cronbach's alpha coefficient, was good across all measurement occasions (α_{T1} = .78, α_{T2} = .78, α_{T3} = .80, α_{T4} = .83, α_{T5} = .83). In addition, since the study was conducted in two languages, we included an examination of factor loading invariance across the French- and German-speaking subsamples to eliminate the possibility of biased responses resulting from different interpretations of the items (see Results section).

Self-rated health. Self-rated health was measured using one item that was developed and used by the World Health Organization (Skevington, Lotfy, & O'Connell, 2004). The participants were asked to rate their health in general on a five-point Likert-type scale (1—*very bad* to 5—*very good*).

4.4. Data Analyses

All data were analysed using the SPSS and AMOS version 24.0. To investigate the relationship patterns between job insecurity and self-rated health, a cross-lagged panel model (CLPM) design with latent variables was used. Specifically, a CLPM falls into the larger category of structural equation models and is intended to analyse reciprocal relationships over

time between two or more variables measured at two or more measurement occasions (Hamaker, Kuiper, & Grasman, 2015; Selig & Little, 2012). The CLPM estimates both autoregressive and cross-lagged effects. The autoregressive effect is the effect of a construct on itself measured at a later time. A large autoregressive effect indicates the stability of individual differences (i.e., it means that individuals' relative standings in the sample have changed little over time). Cross-lagged effects, expressed and interpreted as linear regression coefficients, refer to the effect of one construct on another measured at a later measurement occasion (see Selig & Little, 2012 for more details). Note that in this study, all reported coefficients are standardized and should be interpreted similar to that of Beta coefficients in linear regression.

Job insecurity was modelled as a latent variable with three observed indicators that correspond to the three items of the job insecurity scale (i.e., pertaining to the satisfaction with job security, fear of job loss, and perceived job loss probability), whereas self-rated health was modelled as a single indicator latent variable fixing its error variance to zero (health was measured based on an ordinal scale and was treated as a continuous variable in the current study). We adopted a two-step analytic approach suggested by Anderson and Gerbing (1988). In the first step, measurement model analyses were conducted. Specifically, we conducted a series of measurement invariance tests to check whether factor loadings and item intercepts of the job insecurity scale were invariant across the five measurement occasions (note that measurement invariance tests apply to the job insecurity scale only because self-rated health was measured via a single item). This is an essential step in longitudinal research because the construct can be meaningfully compared across different measurement points only if measurement invariance has been established (Selig & Little, 2012). As per recommendations in the literature (Vandenberg & Lance, 2000), a series of incremental invariance tests were conducted starting from the most liberal configural

invariance test (no constraints to factor loadings and item intercepts applied), proceeding to the metric invariance test (factor loadings set to be equal across measurement occasions), and then followed by the more restrictive scalar invariance test (factor loadings and item intercepts set to be equal across measurement occasions). The conclusion with respect to invariance was drawn when obtaining a non-significant chi-square difference test statistic between the less constrained and the more constrained models. When full invariance was not established, we tested for partial measurement invariance by relaxing some of the equality constraints on item loadings or intercepts.

In a second step, a five-wave cross-lagged analysis was performed. All cross-lagged tests were conducted based on the best fitting measurement invariance model. The error terms of the same job insecurity item were allowed to covary over time. To investigate the direction of cross-lagged relationships, a series of nested model comparisons was conducted. The stability model, which included only autoregressive paths, was treated as a baseline model. Three alternative models were compared to the baseline and to each other where applicable: a) a unidirectional model that included the cross-lagged paths from job insecurity to self-rated health one year later, b) a unidirectional model that included the cross-lagged paths from self-rated health to job insecurity one year later, c) a reciprocal model where the cross-lagged paths from job insecurity to self-rated health and paths from self-rated health to job insecurity were modelled simultaneously. Model fit was inspected using a set of fit indices, namely, the comparative fit index (CFI), Tucker-Lewis index (TLI) and root mean square error of approximation (RMSEA), based on the recommended cut-off values (CFI $\geq$ .95, TLI $\geq$ .95, RMSEA < .06; Hu & Bentler, 1999). Nested model comparisons were based on chi-square statistics. A significant chi-square difference indicates that despite having lower degrees of freedom, an alternative model fits better to the data than the baseline model. In the case of

non-significant chi-square difference statistics, a more parsimonious model (i.e., the one with more degrees of freedom) was retained.

The abovementioned analyses were performed on a dataset that included missing values. For this reason, missing data analyses were conducted on the analytic sample (N = 928). Across the five measurement occasions, the percentage of missing values on self-rated health ranged from zero (at T1) to 12.82% (at T3). The percentage of missing values for job insecurity items ranged from zero (at T1) to 10.88% (at T3). To investigate missing data patterns, Little's MCAR (i.e., missing completely at random) test was conducted using SPSS. While it is difficult to determine the real missing data pattern as it may be due to unobserved values, this test provides an indication of how missing data should be handled. The non-significant test statistics (p = .216) suggested the data to be missing completely at random, which allowed for using the full information maximum likelihood estimator (FIML) to account for missing values in the cross-lagged analyses.

5. Results

Descriptive statistics, which are presented in Table 1, provide information regarding the observed means and correlations between the study variables. They also provide information about the significance of the relationships between sociodemographic characteristics (i.e., age, gender, education level) and the remaining variables. Since age and education level were correlated with self-rated health, they were included as covariates in the cross-lagged analyses at T1. Adding them as predictors of T2 to T5 job insecurity and self-rated health did not change model fit nor the cross-lagged estimates. For parsimony reasons, these paths were removed from the final model. Gender was not related to any of the study variables and was thus excluded from further analyses.

Table 1 about here

Measurement invariance tests yielded support for full metric equivalence of the job insecurity scale across different measurement occasions as the unconstrained model did not differ significantly from the constrained factor loadings model, $\Delta\chi^2(12) = 20.22$, $p = .063$. Furthermore, the results showed partial scalar invariance by testing a model where both factor loadings and item intercepts were held equal across the measurement occasions. In general, we found substantial support for the equivalence of the measurement of job insecurity across different time points. As a result, the subsequent analyses were based on the constrained measurement model, which imposes partial scalar invariance of job insecurity items across the measurement occasions.

It is also important to note that since the survey was conducted in two languages, we conducted invariance tests across the German- and French-speaking subsamples. Full factor loading invariance was observed at T2, T3 and T4, whereas partial invariance was established at T1 and T5 by relaxing the constraints of one item. This suggests that linguistic differences do not represent a major issue, and thus, the data from the two subsamples can be analysed together.

Before investigating cross-lagged effects, the autoregressive (i.e., baseline) model was estimated. The autoregressive coefficients were found to be significant and remained similar in size over time for both job insecurity (β's ranging from .72 to .77) and self-rated health (β's ranging from .62 to .66). Furthermore, the results revealed no significant difference between the freely estimated model and the model with autoregressive coefficients fixed to be equal at all time points ($\Delta\chi^2(6) = 5.60$, $p = .469$). Hence, for parsimony reasons, equality constraints were imposed in the remaining steps of the analysis.

Table 2 about here

A comparison of alternative cross-lagged models is provided in Table 2. As presented in the table, all alternative models had a significantly better fit to the data than the baseline model. In turn, the model with reciprocal cross-lagged relationships between job insecurity and self-rated health was superior to the unidirectional job insecurity-to-health pathway model ($\Delta\chi^2(4) = 16.55$, $p = .002$) and to the reversed unidirectional health-to-job insecurity pathway model ($\Delta\chi^2(4) = 18.53$, $p = .001$). It was retained as the best fitting model illustrating an interchangeable direction of the relationship between job insecurity and health over time.

Figure 1 about here

To finalize the analysis, non-significant cross-lagged paths were removed and the trimmed version of the model was compared to the full reciprocal model. Cross-lagged path coefficients in the trimmed model remained significant and were similar in size to those observed in the full model. A model comparison did not reveal a significant difference between the two models (see Table 2), thus a more parsimonious trimmed model was treated as the final model. Its path coefficients are displayed in Figure 1 and demonstrate a sequence of negative cross-lagged effects from job insecurity to self-rated health, and vice versa. The only exception can be seen in the last follow-up (i.e., T4-T5) where no evidence of significant cross-lagged relationships between job insecurity and self-rated health was found. Nevertheless, consistent with the observed reciprocal pattern, the cross-lagged effect from T4 health to T5 job insecurity was more pronounced ($\beta = -.05$, $p = .103$) than the reverse effect from T4 job insecurity to T5 health ($\beta = -.01$, $p = .798$). The model explains a considerable amount of variance in both job insecurity and self-rated health. The coefficients of determination that indicate the degree of variance of the outcome variable explained by the predictor variables in the model ranged from .54 to .59 for job insecurity and from .40 to .42 for self-rated health.

To better support the results of the yearly pattern of cross-lagged relationships between job insecurity and health status, alternative time lags were tested as well following a similar strategy to that of Meier and Spector (2013). More specifically, we estimated a cross-lagged model with a two-year lag (based on T1, T3, and T5 measurements), a three-year lag (based on T1 and T4 measurements and on T2 and T4 measurements), and a four-year lag (based on T1 and T5 measurements). None of the cross-lagged paths were significant in either the two-year lag or the four-year lag model. In the three-year lag model, based on T1 and T4 measurements, a significant cross-lagged path was observed from T1 job insecurity to T4 health ($\beta = -.09$, $p = .004$), whereas in the three-year lag model based on T2 and T5 measurements, a significant reverse pathway from T2 health to T5 job insecurity was observed ($\beta = -.09$, $p = .006$), thereby strengthening the implication of the cyclical pattern found in the initial five-wave model displayed in Figure 1.

6. Discussion

This study investigated cross-lagged relationships between job insecurity and self-rated health across five yearly measurement occasions in a Swiss sample of mid-career professionals. The results suggest that the direction of the cross-lagged relationships between job insecurity and health may change over time (i.e., T1 job insecurity predicted lower ratings of health at T2, which predicted job insecurity at T3, which in turn related to lower self-rated health at T4; see Figure 1). Hence, instead of concurrent yearly cycles of *job insecurity-health-job insecurity* and *health-job insecurity-health*, we seem to find only one longer-term cycle. One possible explanation for the absence of concurrently reciprocal cross-lagged effects is that a given effect is smaller than the reverse one at a specific time point, and too small to be significant given the sample size. On the other hand, another explanation for the observed cross-lagged pattern is that job insecurity may be the starting point for the detrimental cycle and that it may take time to unfold into further vulnerabilities. Hence, the interchangeable salience of either job insecurity

or self-rated health as a vulnerability aspect depending on the time lag is an interesting finding. It adds novel insights to the scarce previous evidence on bi-directional or reversed effects between job insecurity and health (e.g., De Cuyper et al., 2012; Ibrahim, Smith, & Muntaner, 2009 and to some extent, Kinnunen, Feldt, & Mauno, 2003) and can be interpreted within the theoretical framework of stress and coping (Lazarus & Folkman, 1984). Due to its involuntary nature and the uncertainty that results, the situation of job insecurity will presumably be evaluated as threatening by most people and as having adverse consequences with respect to health over time. This is the principal argument in the literature for naming job insecurity one of the greatest workplace stressors (e.g., De Witte, 1999). In turn, less healthy individuals may be more susceptible to experiencing insecurity as they may see themselves as having fewer resources to cope with workplace adversities, which explains why lower health status predicts later job insecurity. This also could be understood from an objective or pragmatic perspective. Persons with low levels of health are more often at risk of being dismissed by the companies in which they work. This is known as the selection effect (see McKee-Ryan, Song, Wanberg, & Kinicki, 2005). Therefore, the fact that employees feel more insecure because they were unhealthy in the past may reflect the fact that they know that their chances of dismissal are higher because of their health status.

Although evidence of the reversed pathway from self-rated health to job insecurity is not well established in the literature (for an exception, see Ibrahim et al., 2009), and our study observed such a pathway only once at T2-T3 (see Figure 1), such findings draw attention to the risk that being a vulnerability *per se*, health status may increase the chances of being exposed to workplace precarity, for instance, in the form of job insecurity, later in life. Neither the co-occurring reciprocal cross-lagged pattern found in previous studies (e.g., De Cuyper et al., 2012) nor the lagged reversed relationship between job insecurity and health (e.g., Ibrahim et al., 2009) allow for making unequivocal implications regarding the sequence of detrimental

effects (i.e., they do not inform how job insecurity and health-related vulnerabilities may unfold over time in a given population). The findings of the current study thus contribute to the existing literature by suggesting the possibility that the cross-lagged relationships between job insecurity and health may have an interchangeable direction. The finding that T1 job insecurity predicted lower self-rated health status at T2 could refer to primary appraisal (cf. Lazarus & Folkman, 1984) whereby those employees who perceive job insecurity as a greater stressor become more likely to develop health complaints as a consequence of stress compared to their more secure counterparts. Subsequently, the significant path from T2 self-rated health status to T3 job insecurity may be explained by secondary appraisal whereby lower coping resources, in this case, weaker self-rated health, presumably place the person at risk of experiencing job insecurity one year later with an eventual boomerang effect on health.

Such a cyclical process can be additionally explained by COR theory (Hobfoll, 2001). Specifically, one may infer that maintaining job security or trying to cope with insecurity is done at the expense of health, which then may reduce the chances of preserving the desired status quo at work. Within COR theory, this would be explained as a resource depletion process, (i.e., where losing the resources of job security and health build upon each other over time). Hence, the explanations of the current findings offered by COR theory may be thought to supplement those provided by the stress and coping model. The stress and coping model draws particular attention to the importance of subjective interpretations of the stressful situation, whereas COR theory tends to underscore resource loss. As a result, the stress and coping model highlights psychological factors that explain *why* the work situation is perceived as unfavourable, thereby contributing to the detrimental cycle between job insecurity and health. Whereas within COR theory, job security is perceived as part of the work characteristics and as a job resource that may be depleted. Therefore, this theoretical reasoning explains why a lack

of job security may need to be compensated for by employing other resources, such as health reserves.

Several other aspects warrant additional comments when interpreting the results, such as the amount of explained variance in the outcome variables, the size of stability coefficients, and the size of the cross-lagged effects. Notably, the predictive effect of job insecurity on itself measured at a later time was stronger than that of self-rated health, which means that individual standings with regard to health were changing more within the sample over time. This may also explain why the coefficients of determination were slightly larger for job insecurity in that they reflect the effects of both autoregressive and cross-lagged paths.

Another factor is the size of the cross-lagged effects. Despite the increasing popularity of longitudinal research designs, there are no consistent guidelines for interpreting effect sizes based on repeated measures. As noted by Adachi and Willoughby (2015), due to controlling for the prior levels of the outcome variables, cross-lagged coefficients tend to be dramatically smaller than their cross-sectional equivalents. It is, therefore, not accurate to interpret them against the same standard as that used for cross-sectional coefficients. Before interpreting the size of a cross-lagged effect, it is suggested that the corresponding bivariate correlations be inspected. If the correlation is small, a strong cross-lagged association is unlikely (Adachi & Willoughby, 2015). Hence, although not large at first glance, the coefficients obtained in the current study can be considered adequate given that the bivariate correlations between job insecurity and self-rated health were not high.

6.1. Limitations

The present study has several limitations that must be taken into account when interpreting the results. First, the sample may have some attrition bias, as the dropout analyses indicated that the dropout sample reported slightly higher job insecurity levels and lower self-rated health. On the one hand, this tendency can be rather expected in job insecurity studies

and cannot be controlled (e.g., the dropouts may have had unemployment periods or have otherwise changed their work status at some point during the study and thus could not be included in the final sample). On the other hand, one may not exclude the possibility that a certain percentage of eligible respondents may have been lost by eliminating the dropouts. For this reason, the current findings should be interpreted with caution. It is also notable that we relied on subjective ratings of overall health in the current study that did not allow for distinguishing specific health complaints. While overall health ratings are often used in similar studies (e.g., Burgard, Brand, & House, 2009), taking into account specific objective indicators of health would be a valuable addition as they can give a clearer indication of which aspects of health are most affected.

Finally, it is important to note that although cross-lagged analyses allow for testing the direction of the cross-lagged effects, which was the main point of the current study, the standard CLPM approach does not control for unobserved heterogeneity effects that may affect the ratings of the study variables and, therefore, may lead to inaccurate conclusions regarding the underlying prediction pattern. This approach is also not capable of informing about the more complex nuances of dynamic change, such as the rate of change, in the investigated variables. While such analyses were beyond the scope of the current study, they could be a next logical step in further longitudinal research and may provide a more precise insight into the potential cumulative effects related to job insecurity and health.

7. Conclusion

The present study revealed an interchangeable pattern of relationships between job insecurity and self-rated health. Our findings imply that carry-over effects from job insecurity and health, and vice versa, may occur within yearly time lags, one after the other. No evidence was found for the co-occurring (i.e., existing within the same time lag) reciprocal effects within the investigated sample. In this way, we demonstrate that the longitudinal relationship between

job insecurity and health may denote a detrimental cycle with interchangeable dynamics between the two variables. Such findings call for more attention to the fact that not only job insecurity but also health status may constitute an important vulnerability factor in the workplace and that, when building upon each other, these factors may amplify the employee's vulnerability.

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Table 1. Descriptive statistics of the study variables across five measurement points

	Mean	***SD***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Age	43.06	8.10												
2. Gender	-	-	-.01											
3. Education	-	-	-.06	.01										
4. T1 JI	1.65	0.70	.02	-.04	-.03									
5. T2 JI	1.66	0.71	.06	-.05	-.04	.59***								
6. T3 JI	1.67	0.70	<.01	-.03	-.04	.53**	.62***							
7. T4 JI	1.72	0.72	.02	-.03	-.05	.51***	.54***	.61***						
8. T5 JI	1.73	0.70	.03	-.04	-.09*	.46***	.50***	.53***	.65***					
9. T1 SRH	4.25	0.55	-.07*	-.02	.13***	-.12***	-.11**	-.13***	-.11**	-.12***				
10. T2 SRH	4.21	0.55	-.10**	-.03	.13***	-.14***	-.12**	-.18***	-.13***	-.17***	.63***			
11. T3 SRH	4.17	0.56	-.07*	-.04	.10**	-.10**	-.10**	-.18***	-.13***	-.16***	.60***	.65***		
12. T4 SRH	4.17	0.58	-.06	-.04	.13***	-.16***	-.13***	-.20***	-.22***	-.21***	.53***	.59***	.64***	
13. T5 SRH	4.15	0.59	-.06	-.05	.12**	-.08*	-.07	-.15***	-.15***	-.21***	.51***	.55***	.56***	.62***

Note. JI = job insecurity (rated on a 4-point scale), SRH = self-rated health (rated on a 5-point scale). Gender was coded as follows: 1 = male, 2 = female. Education was coded as follows: 1 = compulsory or vocational school, 2 = upper secondary, 3 = higher education. Age was measured at T1. Listwise deletion of missing values was used in correlation analyses.

***$p < .001$, **$p < .01$, *$p < .05$.

Table 2. Cross-lagged model fit and comparison of alternative models

	Fit indices				Model comparison	
Model	$\chi^2(df)$	CFI	TLI	RMSEA	Compared models	$\Delta\chi^2(df)$
M1 – stability model	663.26(193)***	.946	.929	.051	-	-
M2 – JI→health model	646.02(189)***	.947	.929	.051	M1-M2	17.24(4)**
M3 – health→JI model	648.00(189)***	.947	.929	.051	M1-M3	15.26(4)**
M4 – reciprocal model	629.47(185)***	.949	.930	.053	M1-M4	33.79(8)***
M5 – reciprocal trimmed model	633.90(190)***	.949	.932	.053	M5-M4	4.43(5)

Note. JI = job insecurity. In the final model M5, the coefficients of determination for job insecurity ranged from .54 to .59 and for self-rated health, they ranged from .40 to .42.
***$p < .001$. **$p < .01$.

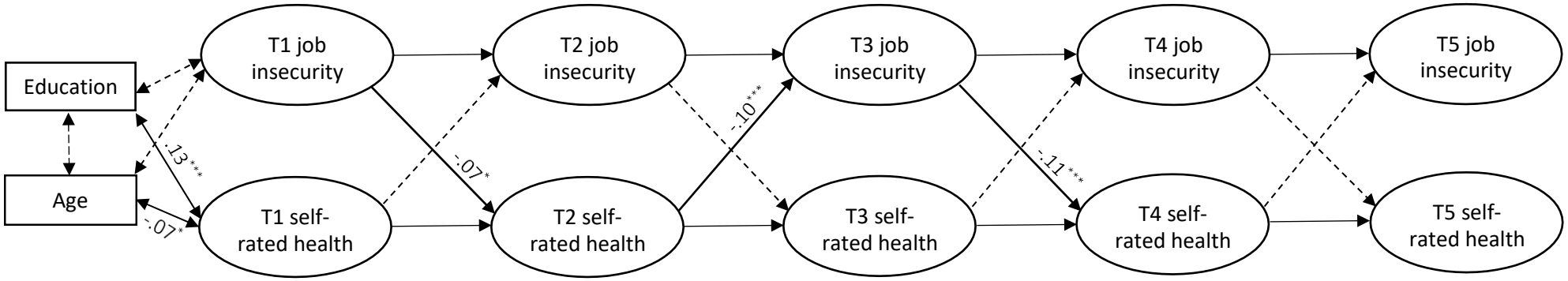

Fig 1. Cross-lagged relationships between job insecurity and self-rated health. Standardized estimates are provided. Dashed lines represent non-significant paths. Autoregressive coefficients, item loadings and residual correlations are not displayed. ***$p < .001$. *$p < .05$.