Cross-lagged effects of resilience and indicators of sustainable employability; a study among Dutch police officers

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Abstract

Purpose – Sustainable employability is an important goal for individuals and organizations alike. However, scarce knowledge is available on possible cross-lagged relations of resilience among police officers and different aspects of their sustainable employability over time. Based on assumptions of COR theory, the purpose of this paper is to test these relations in a two-wave design.

Design/methodology/approach – A total of 532 police officers participated in a time-lagged survey design (time interval of six months) concerning their resilience and relevant aspects, i.e., self-reported vitality, workability and organization-reported individual absenteeism rates. Data were analyzed with structural equation modeling.

Findings – Results indicate cross-lagged effects between resilience and vitality with an acceptable model fit. Thus, the level of resilience at T1 affected the level of vitality at T2 and vice versa. In addition, a nearly significant negative effect of vitality on T1 was found on absenteeism on T2.

Research limitations/implications – More measurements over time are needed to test reciprocal relations and possible gain spirals. Different samples are needed to assess generalizability. Cross-lagged effects may indicate a reciprocal relation between resilience and vitality that can be further facilitated.

Practical implications – For example, resilience can be addressed explicitly in training.

Originality/value – This study is the first to test the cross-lagged relations between resilience and indicators of sustainable employability among police officers. It is important to further study this for the sake of both police officers, as well as society as a whole.

Keywords Resilience, Absenteeism, Police officers, Sustainable employability, Vitality, Workability

Paper type Research paper

Introduction and contribution

Resilience and sustainable employability are of key importance for police officers. Police officers face a high work load, high pressure and emotional contacts with civilians (Juniper *et al.*, 2010). The high work load, emotional client contacts, and long/irregular working hours can hamper police officers' health, workability and vitality (see e.g. Andersen *et al.*, 2015) and thereby the continuation of their work "in the line of duty." Sustainable employability

Policing: An International Journal
Vol. 42 No. 6, 2019
pp. 961-975
Emerald Publishing Limited
1363-951X
DOI 10.1108/PIJPSM-01-2019-0003

refers to the continuous possibilities and capabilities of individuals for current and future work (LeBlanc *et al.*, 2017; Semeijn *et al.*, 2015; Ybema *et al.*, 2017). A mixture of developments in the context of work (such as, economic, demographic, personalization) makes it a topic of interest, not only at the individual level, but at the organizational and societal levels as well. Questions arise as to what is needed to keep people sustainably employable over their lifespan (Semeijn, 2018; Truxillo and Fraccaroli, 2016).

This study aims to elicit the importance of resilience for sustainable employability of, in particular, police officers. After and during their work, police officers have a need for quick recovery from stressful situations to restore and enlarge their resources. In this way they are able to preserve their sustainable employability. Resilience is such a resource. More specifically, resilience is a personal resource that is part of the so-called psychological capital (PsyCap) of people (Luthans *et al.*, 2007). It is generally defined as the capacity to bounce back from adversity, conflict and failure, or even positive events (Luthans *et al.*, 2007). Britt *et al.* (2016) argue that resilience is used in different forms and meanings, and still lacks conceptual clarity. In our study, we align to the stream of research that considers (police officer) resilience as an important personal resource in the context of work (see e.g. Andersen *et al.*, 2015; Kossek and Perrigino, 2016). The job demands-resources (JDR) model (Demerouti *et al.*, 2001; Bakker and Demerouti, 2007) explains that resilience serves as an antecedent of sustainable employability, at least when it comes to work engagement, which includes vigor (or vitality), dedication and absorption.

Empirical studies confirm that resilience is related to indicators of sustainable employability, such as employability, vitality and workability (Avey *et al.*, 2009; Avey *et al.*, 2011). Thus, resilience can be seen as a personal resource that may help to deal with job demands and therefore help to conserve or even lead to increased vitality and workability, and a possible reduction in absenteeism. However, scarce empirical knowledge is available on the causality over time of the effects of employee resilience on indicators of sustainable employability (see also Britt *et al.*, 2016; Kossek and Perrigino, 2016). Are there reversed or even cross-lagged effects between resilience and its outcomes in terms of vitality and workability, such as assumed by the conservation of resources (COR) theory (Hobfoll, 2001, 2011)? The aim of our study is to investigate the cross-lagged impact of resilience on indicators of sustainable employability, i.e. vitality, workability and a more objective (organizational measure) indication of absenteeism.

Since resilience and sustainable employability are relevant topics in the context of police work, we use a two-wave time-lagged study design with a sample of 532 Dutch police officers to investigate resilience and its cross-lagged effects with indicators of their sustainable employability.

The present study advances prior research in several ways. First, most studies about resilience focus on personal characteristics and coping styles to handle trauma and (extreme) adversity (e.g. Bonanno, 2004). The present study specifically addresses the work-related ability to bounce back and adapt to work-related stress and illness, based on the conceptualization of Luthans *et al.* (2007). Second, although several studies have addressed resilience at work, these studies mainly focus on one-way relationships; between resilience and personal psychological predictors of resilience (e.g. positive emotions, see Meneghel *et al.*, 2016), or relevant outcomes, such as thriving at work, job satisfaction and employee well-being over time (see e.g. Kossek and Perrigino, 2016). The present study investigates possible cross-lagged effects between resilience, vitality, workability and absenteeism. Third and finally, our study explicitly connects literature about resilience and sustainable employability, a connection that hitherto has not been studied.

Sustainable employability and personal resources

Sustainable employability is of major concern to individuals, organizations and society as well, since in current Western society individuals need to work longer and meanwhile stay healthy

and preferably also happy at work (De Lange *et al.*, 2016; De Vos *et al.*, 2018). Happy and healthy people contribute to healthy businesses and organizations (Stewart, 2010). Core values in work and business have shifted toward more social responsibility (Lindgreen and Swaen, 2010) and more sustainability, also in the management of human resources (Ehnert and Harry, 2012; Beer *et al.*, 2015) and careers (De Vos *et al.*, 2018; De Vos and Vander Heijden, 2015). In all, sustainable employability refers to the individual's possibilities and capabilities to continue to work, and further develop in one's work, while staying happy (vital) and healthy (workable). Although sustainable employability can be measured in different ways and by different concepts (see e.g., Fleuren *et al.*, 2018), for the purpose of this study we focus on vitality and workability aspects, as well as a more objective indication of health aspects, namely absenteeism.

Research indicates that (personal) resources are important antecedents for sustainable employability (Semeijn *et al.*, 2015). In COR theory, resources are described as "[…] those entities that either are centrally valued in their own right, or act as means to obtain centrally valued ends" (Hobfoll, 2002, p. 307). Studies indicate that personal resources are important for functioning at work (Luthans *et al.*, 2007; Van Dam, 2013). The importance of resilience as a "psychological capital" resource (Luthans *et al.*, 2007) has already been confirmed by several authors (see e.g. Upadyaya *et al.*, 2016), also in the police context (see e.g. Papazoglou and Andersen, 2014; Siu *et al.*, 2015).

In these studies, resilience is generally defined in line with "the capacity to rebound or bounce back from adversity, conflict, failure, or even positive events, progress, and increased responsibility" (Luthans, 2002, p. 702). Exemplary studies into positive effects of resilience in the work context are indicating effects on, for example, thriving at work (Paterson *et al.*, 2014), well-being (Roche *et al.*, 2014; Siu *et al.*, 2015) and higher levels of employee performance over time (Peterson *et al.*, 2011). However, so far the effect of resilience on indicators of sustainable employability among police officers has not been addressed.

The impact of resilience on aspects of sustainable employability
In this study we follow two basic assumptions of the COR theory (Hobfoll, 2001, 2002, 2011) to underpin our hypotheses. The first is that people are motivated to invest in their resources to attain their (work-related) goals (Hobfoll, 1989). Second, people will not only try to protect their resources but also try to let these grow and develop. Therefore, we propose that resilience will result in (different) resource gains for individual employees, and hence lead to (better) vitality and workability, and a reduction in absenteeism. Similarly, in line with COR theory, we expect that perceived vitality, and workability of individual employees will also be positively related to individual resilience.

Several studies have investigated the positive relationship between resources and work engagement as an outcome (see e.g. Salanova *et al.*, 2010). Also personal resources have been associated with work engagement. For example, Llorens *et al.* (2007) found that efficacy beliefs play an important role for engagement, which also includes a vitality dimension. Moreover, this positive relationship is also found with respect to different personal resources, such as self-esteem, optimism and resilience (see e.g. Bakker and Demerouti, 2008; Xanthopoulou *et al.*, 2009). More recently, Upadyaya *et al.* (2016) confirmed a positive cross-lagged association between resilience and work engagement (including vitality) with a sample of Finnish workers. Therefore, it is expected that resilience is positively related to the vitality among Dutch police officers as well. Hence, we hypothesize:

H1. Resilience will have a positive cross-lagged impact on the vitality of police officers.

As regards the workability of police officers, we argue that resilience will also have a positive effect on their workability. Resilience is known to be beneficial for health (Papazoglou and Andersen, 2014; Smith *et al.*, 2008) and health is known to be associated with workability (Van den Berg *et al.*, 2009). The process of affecting workability could work as follows: when

police officers reveal more resilience, according to COR theory (Hobfoll, 1989) they are in a better position to invest in resources, as compared to their less resilient colleagues. Thus, they are motivated and have the opportunities to nourish and conserve other (new) resources, such as their health. These other resources can also generate relevant outcomes in terms of sustainable employability of police officers. More specifically, better resilience may be related to better health and well-being among police officers (Papazoglou and Andersen, 2014), which is also closely connected to their workability. Hence we expect that:

H2. Resilience will have a positive cross-lagged impact on the workability of police officers.

In the same line of thought, resilience can be expected to have a cross-lagged impact on absenteeism rates. The relationship between resilience and absenteeism rates was already investigated by Avey *et al.* (2006). This study showed that positive psychological capital reduces levels of both involuntary and voluntary absenteeism. As resilience can be considered positive psychological capital, we hypothesize:

H3. Resilience will have a cross-lagged negative impact on absenteeism rates of police officers.

Theoretical and conceptual studies have suggested that positive adaptation to work stressors as reflected by increased health and well-being, may feed back into increasing the capacity for resilience (Britt *et al.*, 2016). Moreover, according to COR theory (Hobfoll, 1989, 2001), people are motivated to seek, obtain, conserve and develop resources. The positive effects of having resources and obtaining positive outcomes as a result, motivate individuals to further invest in resources to obtain further positive outcomes again. In this way, even so-called gain spirals can be created (Salanova *et al.*, 2010). Gain spirals refer to a positive growth process that includes both resources and outcomes.

While resilience of police workers can be of crucial value in enhancing vitality and workability and lowering absenteeism rates, having a better vitality and workability will also have a beneficial effect on the future resilience of these police officers. More specifically, police officers will become resilient over time as they encounter work stressors and successfully cope with them. By gaining personal resources in terms of vitality and workability when adapting to adversities and coping with work experiences, they are likely to fortify their resilience. Thus, building on the notions of the COR theory of Hobfoll (2001), and in line with empirical evidence on the relations between personal resources and work-related outcomes so far, we expect a reciprocal relationship between resilience and indicators of sustainable employability. Hence, we hypothesize:

H4. Vitality will have a positive cross-lagged impact on resilience of police officers.

H5. Workability will have a positive cross-lagged impact on resilience of police officers.

In sum, the conceptual model for this study and their relations is presented in Figure 1.

Method
Sample and procedure
We tested our hypotheses using a two-wave longitudinal design with six months' time lag. It is theoretically difficult to determine the "right" period (Britt *et al.*, 2016). We consider six months as an appropriate time-lag for testing cross-lagged relationships, herewith following other recent studies into concepts related to sustainable employability, such as, psychological well-being (Dagenais-Desmarais *et al.*, 2017) and employability (Philippaers *et al.*, 2016). The targeted sample consisted of 2,512 Dutch police workers. We expected that the response rate would drop in the second wave, therefore we aimed at reaching as many respondents as possible for the first wave. An online survey was accompanied by a cover letter that ensured strict confidentiality of responses and explained that participation was voluntary.
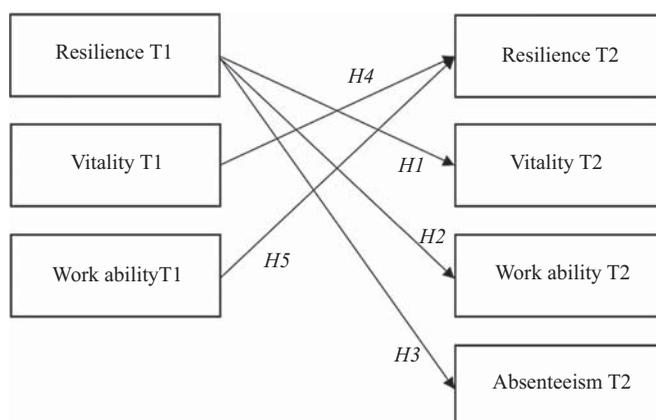
We received 1,489 (of 2,512) completed questionnaires at T1, referring to a response rate of 59 percent on T1. Data gathering at T2, among the respondents of T1, resulted in 532 (of 573) completed sets with employee responses at T1 and T2, yielding a response rate of 38 and net 36 percent. Representativeness of the data was satisfactory with regard to demographics and control variables as compared to the respondents on T1, and as compared to our targeted sample of 2,512 respondents, as far as information was available.

Measures
Key concepts were measured with validated and reliable survey measures. All variables were measured at two moments in time (T1 and T2) with a six months' lag, except for the absenteeism rates that we retrieved from the organization at T2.

Resilience was measured with the Dutch version of the 25-item resilience scale of Wagnild and Young (1993) ranging from 1 (totally disagree) to 5 (totally agree). An example item is "I usually manage one way or another." Reliability of the scale was confirmed by Ahern *et al.* (2006). In our study, α was 0.92 at T1 and 0.93 at T2. Validity of the two-factor scale was tested by examining two-factor solutions on T1 and T2 using Varimax and Oblimin rotations of the factor loading matrix. Initial Eigen Values on T1 indicated that one factor explained 35.8 percent, and the second to the fifth factor 18.5 percent (T1). On T2 Eigen Values indicated that one factor explained 38.8 percent, and the second to the fourth factor 15.8 percent. For the purpose of our study, the single factor solutions for resilience in T1 and T2 were preferred and used for further analysis, considering resilience as one integrated concept. These solutions explain 35.8 and 38.2 percent of the variance in factor loadings, respectively. KMO values were satisfactory with 0.94 (T1) en 0.94 (T2); > 0.6 en Bartlett's was significant T1 ($\chi 2 = 5{,}531.4$, $p < 0.05$)/T2 ($\chi 2 = 5{,}596.9$, $p < 0.05$). However, two items were eliminated for our definite measurement of resilience on T1 and T2, because they did not meet the criterion of having a primary factor loading of 0.1 or above, and no cross-loading of 0.3 or above (Hair *et al.*, 1998). The items are item 3 ("I am able to depend on myself more than anyone else") and item 23 ("When I'm in a difficult situation, I can usually find my way out of it") on T1 and T2. We further tested the fit of the resulting resilience data with Confirmatory Factor Analysis in AMOS.

Vitality was assessed with the three items of the vitality dimension of the nine-item Dutch Utrecht Work Engagement Scale (UWES, or UBES in Dutch; Schaufeli and Bakker, 2003). An example item is "At my work, I feel bursting with energy." Items were rated on a

seven-point scale ranging from 0 ("never") to 6 ("daily"). Validity and reliability of this scale have been confirmed extensively in previous research (see e.g. Seppälä *et al.*, 2009; Schaufeli *et al.*, 2006). For the current study, reliability of the vitality scale is high as well (0.83 at T1 and 0.84 at T2). Validity appeared to be good as well, with one-factor solutions on both T1 and T2 that explained 63.8 and 64.5 percent of the variances, respectively.

Workability was measured with the one-item dimension of the validated shortened Dutch version of the Workability Index (Ilmarinen *et al.*, 2005). The item requires respondents to rate their current workability on a 1–10 rating scale.

Absenteeism was retrieved from the absenteeism data registration system of the organization, and refers to the total number of days absent from work at T2 divided by the total of potentially available days at T2 per employee.

We controlled for age (calendar years), gender (male $= 1$, female $= 2$), working hours per week, tenure in the organization (measured by years of experience in the current job) as this reflects domain expertise (Oldham and Cummings, 1996). Furthermore, educational level was added as a possible control variable, measured in five categories ranging from 1 for basic education to 5 for Master level.

Analytical method
Structural equation modeling (SEM) and AMOS software (Arbuckle, 2014) were used to analyze the data and the hypothesized relationships. Missing values are automatically dealt with in AMOS, by using full information maximum likelihood estimation. We examined a series of models to test the appropriate operationalization for our data. We started by conducting an item-level confirmatory factor analysis (CFA) to test whether it was suitable to use the observed total scores of our self-reported constructs. The results indicated an incremental fit with a comparative fit index (CFI) > 0.9.

Next, a model without cross-lagged paths but with autocorrelations and synchronous correlations was assessed (stability model; M1). It appeared that with the full stability model based on our data, it was not possible to obtain fit. Results indicated a CFI of 0.93, but also a root mean square error of approximation (RMSEA) of 0.143, which is above its range for fit. Therefore, we systematically tested the stability model without vitality, then without workability and finally without absenteeism. It appeared that the stability model without workability showed the best possible, although still marginally acceptable, RMSEA, with a value of 0.098 (see also Table II). We therefore decided to continue our comparative analyses based on the stability model without workability included (our final resulting M1).

The stability model was compared with several different competing models; the second model (M2) was identical to the stability model, but included the direct causal effects as well, by additional structural paths from T1 resilience to T2 vitality and to T2 absenteeism. The third model (M3) was identical to the stability model but included (solely) additional paths from T1 vitality to T2 resilience and T2 absenteeism. In the next step, a fourth model (M4) tests the paths of M2 without including absenteeism, as well as a fifth model that tests the paths of M3 without absenteeism (M5). In two further models, and following the procedure as recommended by Kenny (http://davidkenny.net/cm/fit.htm), time-reversed effects are tested; from vitality T2 to resilience T1 (M6) and from resilience T2 to vitality T1 (M7). Notably, these models are not expected to have an acceptable fit because of these unreal time-reversed paths, hence serve as a validity check. Finally, the structural cross-lagged model (M8) included all paths of the Models 1–3.

The fit of the nested models to the data was assessed with χ^2 statistic and the RMSEA. In addition, two fit indices were used for comparative analysis: the CFI and the Tucker–Lewis Index (TLI). For each of these statistics, values of 0.90 are acceptable and of 0.95 or higher are indicative of good fit (Hu and Bentler, 1999). For the RMSEA values of up to 0.08 represent acceptable errors of approximation (Browne and Cudeck, 1993).

Results
Descriptives and correlations
Descriptive statistics and correlations of all variables included in the study are presented in Table I. As can be seen from the table, only small to modest associations are present between all variables included. The largest correlation shows between age and tenure ($r = 0.71$, $p < 0.01$), which is quite interpretable as most of the older police officers have tenure. Table I indicates that the control variables are not structurally associated with any of the main variables.

To arrive at a parsimonious design of our model, and after testing the effects of age that appeared not to make any significant difference, we decided to leave out the control variables as advised by Becker (2005).

Model testing
Table II shows the fit indices of our competing models, as well as the model comparisons. The stability model (M1) including resilience, vitality and absenteeism showed a rather minimum acceptable fit to the data. M2 and M3 showed not much better fits, considering the indices testing the criteria. M4 and M5, referring to the cross-lagged relations, appeared no eligible alternatives either. Models M6 and M7 can be considered test cases that are supposed to reveal bad fits, because of the reversed effects, which were indeed confirmed. Only our final structural cross-lagged model (M8) revealed an acceptable fit (RMSEA = 0.080; CFI = 0.98; TLI = 0.90; $\chi^2 = 19.14$; df = 2; $p = 0.000$). M8 fits the data fairly well based on CFI and RMSEA, but the value of χ^2 is actually too large. The optimal range of this value should be upper than 1, lower than 5 (Epitropaki and Martin, 2005; Schumacker and Lomax, 1998). However, the p-value is still significant.

These findings therefore show that the model including cross-lagged relationships among resilience, vitality, and absenteeism on T2 best explains our data.

Hypothesis testing
The path coefficients of the resulting cross-lagged structural model (M8) are displayed in Table II. We used Maximum Likelihood Estimation to examine the hypothesized relationships.

The results of Table II can be interpreted as follows. Resilience has a positive cross-lagged impact on the vitality of police workers, confirmed by the estimate of 0.047 ($p = 0.000$) in Table II. This is supportive for *H1*. The positive cross-lagged impact of resilience on the workability of police officers could not be tested, because workability does not fit the structural model. Therefore *H2* could not be tested with our data. Furthermore, we found no cross-lagged negative impact of resilience on absenteeism rates of police officers, as the estimate in Table II indicates a value of 0.014 ns. Hence *H3* was not supported. Vitality shows a positive cross-lagged impact on resilience, as indicated by the relevant estimate of 0.387 ($p = 0.000$) in Table II. Therefore, *H4* could be confirmed.

Finally, as workability did not fit our model, it was not possible to test whether it would have a positive cross-lagged impact on resilience. *H5* could therefore not be tested with our data either. The resulting standardized path coefficients of the cross-lagged structural model (M8) for this study is presented in Figure 2.

Conclusion and discussion
Conclusion
This study aimed at identifying possible cross-lagged effects of resilience as a personal resource at work, and outcomes of sustainable employability. Several models were tested to reveal the best fit within a sample of 532 Dutch police officers. Our results advance

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Resilience T1 (1–5) total	99.04	9.42	–																
2. Resilience T2 (1–5) total	99.05	9.91	0.46**	–															
3. Vitality T1 (0–6) total	13.19	3.71	0.37**	0.28**	–														
4. Vitality T2 (0–6) total	12.94	3.81	0.37**	0.32**	0.68**	0.46**													
5. Work ability T1 (0–10)	7.77	1.26	0.39**	0.27**	0.54**	0.46**	0.54**												
6. Work ability T2 (0–10)	7.69	1.21	0.26*	0.30**	0.41**	0.46**	0.54**												
7. Absenteeism T2 in percentage	4.4%		–0.04	–0.06	–0.08	–0.12**	–0.29**	–0.26**	–										
8. Age in years	44.54	10.25	–0.06	–0.02	0.01	0.00	–0.14**	–0.10*	–0.01	–									
9. Gender (male =1)	68%		–0.03	0.02	0.09*	0.08	0.05	0.02	–0.16**	0.27**	–								
10. Married/couple (yes = 1)	85%		–0.04	0.00	0.05	–0.00	0.05	–0.01	0.03	0.12**	0.16**	–							
11. Education (1–6)	3.59	0.96	0.08	0.10*	0.04	0.03	0.11*	0.10*	–0.01	–0.19**	–0.08	0.01	–						
12. Irregular work (yes =1)	84%		0.01	–0.00	–0.05	0.02	0.06	0.05	–0.06	–0.18**	0.09*	–0.01	0.09*	–					
13. Tenure in years	16.06	11.47	–0.10*	–0.08	–0.03	0.00	–0.12*	–0.07	–0.08	0.71**	0.29**	0.14**	–0.17**	–0.09*	–				
14. Work region (city = 1)	58%		–0.08	–0.02	–0.09*	–0.10*	–0.09*	–0.03	–0.03	0.10*	0.02	0.03	–0.08	–0.05	0.10*	–			
15. Type of work (basic =1)	49%		–0.06	–0.02	–0.01	0.01	–0.01	0.04	–0.08	–0.35**	0.07	–0.06	0.01	0.35**	–0.20**	0.07	–		
16. Type of work (district = 1)	12%		–0.04	–0.11**	–0.03	–0.02	–0.04	–0.02	–0.03	0.21**	0.14**	0.06	–0.05	0.12**	0.28**	0.01	–0.37**	–	
17. Type of work (research = 1)	13%		–0.09*	0.00	–0.05	–0.05	0.02	0.01	0.03	0.03	–0.12**	0.00	0.00	–0.20**	–0.02	–0.02	–0.37**	–0.14**	–
18. Type of work (other =1)	26%		0.17**	0.10*	0.07	0.04	0.03	–0.04	0.09*	0.22**	–0.09*	0.02	0.03	–0.33**	0.03	–0.07	–0.59**	–0.22**	–0.23**

Notes: $n = 532$. *$p < 0.05$; **$p < 0.01$

Table I.
Means, standard deviations and correlations for all variables in the study

Model	Model contents	χ^2	df	p	RMSEA	CFI	TLI	Model comp	Delta χ^2	Delta df
M1	Stability model	50.60	7	0.000	0.098	0.93	0.86	–		
M2	M1 + causal model RS1 > Vit2/Abs2	36.68	5	0.000	0.099	0.95	0.86	M1–M2	13.92	2
M3	M1 + causal model Vit1 > RS2/Abs2	32.9	5	0.000	0.093	0.95	0.87	M1–M3	17.7	2
M4	M1 + cross-lagged model Vit1 > RS2	32.91	5	0.000	0.093	0.96	0.87	M1–M4	17.69	2
M5	M1 + cross-lagged model RS1 > Vit2	33.52	4	0.000	0.094	0.96	0.87	M1–M5	17.08	3
M6	M1 + time-reversed model Vit2 > RS1	21.44	2	0.000	1.22	0.97	0.85	M1–M6	29.6	5
M7	M1 + time-reversed model RS2 > Vit1	45.62	2	0.000	0.182	0.93	0.66	M1–M7	4.98	5
M8	Cross-lagged structural model	19.14	2	0.000	0.080	0.98	0.90	M1–M8	31.2	5

Note: $n = 532$
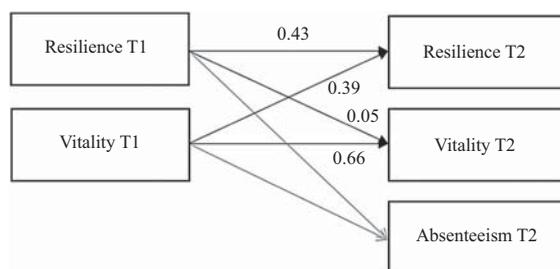
theoretical insights about sustainable employability as our study is the first to investigate and demonstrate longitudinal support for crossed lagged relationships between work-related resilience and aspects of sustainable employability, notably vitality. Hitherto, these links have not been studied and tested explicitly before. A model in which resilience, vitality and absenteeism were included appeared to have the best fit. In this model, COR as well as cross-lagged effects were present among resilience and vitality, supporting *H1* and *H4*. A negative impact of resilience on absenteeism rates could however not be confirmed (*H3*). Workability appeared not fit the structural model on resilience and sustainable employability. Hence, *H2* and *H5* could not be tested with our data.

Discussion
These results imply that, in the context of police work, the cross-lagged effect of resilience on indicators of sustainable employability is partly confirmed, namely for vitality. In our sample of Dutch police officers, the level of resilience is important for vitality six months later. Similarly, the level of vitality is important for the resilience of police officers as well. In other words, resilient employees are more vital and vice versa. This finding is in line with our expectations, based on the assumptions of the COR theory. Although the two-way relationship between resilience and aspects of sustainable employability has never been explored as such, several studies provide initial evidence for relationships between resilience and different work-related outcome variables. Prior research has shown that resilience of employees is crucial with regard to, for example, job satisfaction, work happiness and organizational commitment (e.g. Youssef and Luthans, 2007; Huang and Luthans, 2015). Other studies show that resilience is an outcome of the interaction between job resources and demands (Meneghel *et al.*, 2016). Moreover, research indicates a two-way relationship between resilience and work engagement (see e.g. Bakker and Demerouti, 2008). Our results indicate that the relationship between resilience and vitality goes both ways for Dutch police officers as well.

We found that workability did not fit a model in which both resilience and indicators of sustainable employability were included. This finding may be explained by our study design. In the present study workability was measured by a single item. Although this way of measuring workability is legitimate in workability research (see e.g. Ahlstrom *et al.*, 2010) and has been shown to reduce common method bias (Gardner *et al.*, 2016), its meaning and value within our model may not be fully captured by employing a single-item scale. Furthermore, arguably, the six month time lag between measurement moments may be too short to capture effects of an improved resilience on workability and vice versa. In a review of the literature on longitudinal organizational stress, Zapf *et al.* (1996) found that most studies use a six months or a one year time lag. However, for determining crossed lagged effect between resilience and workability, a one year period might be recommendable.

We did not find support for a positive cross-lagged effect of resilience on absenteeism. Extant studies about absenteeism have demonstrated that absenteeism is reduced when job resources are present, such as social atmosphere (Cortese *et al.*, 2010; Ulleberg and Rundmo, 1997) and work-life balance (Hobson *et al.*, 2001; Hughes and Bozionelos, 2007). A possible explanation could be that work-related resilience is a construct that captures job aspects as well as personal aspects and therefore has a different effect on absenteeism than pure job-related characteristics. Notably, we did find a cross-lagged effect of vitality on absenteeism at the 0.10 significance level, which means that vitality may have an impact on absenteeism rates. However, the cross-lagged effects of indicators of sustainable employability among themselves were not the primary focus of this study (Table III).

Limitations and future research

Our study is subject to several limitations which give rise to further research. First, we measured the key variables in our study at two moments in time. In this way we addressed a shortcoming of the existing empirical literature which is predominantly based on cross-sectional data. Although the significant cross-lagged effects we have found may suggest causation, they do not yet prove causation. Longitudinal data collection and analysis of cross-lagged effects are vital steps toward advancing insights on the dynamic processes that take place between resilience and sustainable employability of police officers.

Moreover, considering our additional finding that vitality tends to have a cross-lagged effect on absenteeism, the role and reciprocal cross-lagged effects of indicators of sustainable employability themselves could be included and explored in future research as well. Our findings are a starting point for other studies, as our model may provide key inputs to the construction of more complex causal models about the interplay between resilience and sustainable employability. In more advanced models it would be useful to include variables that were not considered in the present study, but could have an influence on the interplay between resilience and sustainable employability. For example, social support structures and social networks may be crucial in building resilience and sustainable

	Estimate	SE	CR	p
Vit2 ← RS1	0.047	0.013	3.724	0.000
RS2 ← RS1	0.429	0.040	10.796	0.000
Vit2 ← Vit1	0.655	0.032	20.617	0.000
RS2 ← Vit1	0.387	0.102	3.801	0.000
Abs2 ← RS1	0.014	0.037	0.376	0.707
Abs2 ← Vit1	−0.170	0.094	−1.820	0.069

Note: $n = 532$

Table III.
Path coefficients of the structural cross-lagged model

employability (Fugate *et al.*, 2004), as well as self-management skills (Wittekind *et al.*, 2010). In this way, it would be possible to arrive at a more complete model specification of the dynamic characteristics of sustainable employability.

A second limitation pertains to our study design. Unfortunately, we could not use absenteeism scores on T1, due to the cumulative calculation of absenteeism rates in the organization that was based on the full year at the specific time of measurement. When using a six month time lag this implies overlap and therefore bias when using both absenteeism scores at T1 and T2. Future studies that are able to align time-lags with possible organizational measures, may overcome this limitation. In addition, it is also recommendable that organizations carefully (re)consider their measures and methods used too, to allow and optimize monitoring of relevant data on the sustainable employability of their workers.

Finally, our sample was highly homogenous; meaning we only included Dutch police officers. This is a potential limitation when considering the generalizability of our findings toward police officers from other countries. It would be worthwhile for other studies to replicate our design in different national settings to see whether our findings are generalizable or "typically Dutch."

Nevertheless, we believe that our study addresses interesting dynamic processes concerning sustainable employability, with specific relevance for the police context these days. It has advanced current insights about the interplay between resilience and sustainable employability for police officers, a subject that has not previously been explored at this level of detail.

Implications for practice
This study has important managerial implications. The results of this study indicate that when employees are resilient, they are vital too. Resilience and vitality are interrelated. This provides several opportunities for human resource departments of organizations to enhance sustainable employability, and specifically resilience and vitality. A first opportunity lies in the facilitation of measures that increase resilience. This can be done, for example by adding valuable "job resources" and making them available to employees in order to strengthen the motivational process in the line of duty. For police officers this may entail organizing explicit social support and enhancing social network structures among colleagues and supervisors (see also Graf, 1986).

Second, in similar vein, the process of energetic depletion can be buffered as much as possible. Various studies have been undertaken to identify mechanisms via which stress and burnout can be prevented (see e.g. Arnetz *et al.*, 2013). For example, a common stressor in daily police practice stems from mistakes that are made in volatile situations. Officers can ruminate about decisions they made and feel that they should have made. Provide adequate back up and help facilities in these cases could be useful to curtain the negative (depleting) energetic process. This process may occur when police officers handle situations and take decisions under strain and that backfire on the amount and quality of their personal resources, such as the quality of their sleep (see also Gerber *et al.*, 2013).

Third, organizational training programs that are dedicated to increasing resilience and vitality in employees may have beneficial effects (see e.g. Papazoglou and Andersen, 2014; Robertson *et al.*, 2015) and might aim at life-style awareness (sleep quality) next to exploring resilient behavior itself.

In all, this study reveals cross-lagged effects between resilience and vitality of police officers. This might indicate possible gain spirals that are further research efforts worthy in the context of police work. After all, the sustainable employability of police officers is an important topic for the near future and requires knowledge and insights on how to facilitate and stimulate them best for optimizing their sustainable employability.

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