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Testing the reciprocal associations among co-worker incivility, organisational inefficiency, and work-related exhaustion: A one-year, cross-lagged study

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Abstract

In spite of the considerable number of studies on co-worker incivility, knowledge on this topic needs to be further enhanced. In particular, no studies have focused on the reciprocal nature of the relationship of incivility with other important aspects of working life, i.e. employee well-being and the quality of the working process. The aim of the present study was to examine the cross-lagged associations among co-worker incivility, work-related exhaustion, and organisational efficiency in a sample of healthcare workers. Based on the conservation of resource theory, we hypothesised that those three variables affect each other reciprocally over the time. Data from a two-wave study design (with a one-year time lag) were utilised, and cross-lagged structural equation models were performed. Results confirmed that incivility and efficiency affected each other reciprocally over time. On the other hand, whereas incivility positively predicted exhaustion and exhaustion at inversely predicted organisational efficiency, the opposite paths were found to be not significant. The study suggests that efficiency is crucial for understanding incivility because it operates both as its cause and as its outcome. Interventions aimed at promoting civility and respect in the workplace may help prevent co-worker incivility, work-related exhaustion, and enhance organisational efficiency.

Keywords

Co-worker incivility; work-related exhaustion; organisational efficiency; cross-lagged associations; conservation of resources theory (COR)

Due to its high prevalence in workplaces and its harmful potential, co-worker mistreatment has become an important research topic in the field of Occupational Health Psychology (OHP) in the last few decades. Co-worker mistreatment is an “umbrella” term that identifies a wide range of behaviours and attitudes resulting in a hostile environment for the target

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(Leiter, 2013). In order to capture the various facets of this complex phenomenon, researchers have investigated it using a variety of different constructs in terms of intensity, frequency, and intent (Leiter, 2013). Examples of these constructs are bullying, social undermining, workplace aggression, and emotional abuse (Hershcovis, 2011; Leiter, 2013). In this context, co-worker incivility has been identified as one of the most subtle and common forms of mistreatment and refers to any low-intensity deviant behaviour (s) with ambiguous intent to harm the target in violation of the norms of mutual respect (Andersson & Pearson, 1999). Examples of uncivil behaviours include rudeness (e.g. raising the voice), disrespect (e.g. ignoring or excluding a worker), and unfairness (e.g. doing demeaning things to a worker).

Some authors have argued that most constructs describing the various forms of mistreatment significantly overlap each other, highlighting that in many cases their commonalities may appear more salient than their differences (Hershcovis, 2011). This overlap is also due to the fact that higher-intensity forms of mistreatment may also encompass the milder forms (Hershcovis, 2011). However, regarding incivility, it is possible to identify some specific features that, from a conceptual point of view, differentiate it from other forms (Tepper & Henle, 2011). First, incivility is the mildest form of mistreatment, as it refers only to low-intensity deviant behaviours. Different from bullying or aggression, it clearly does not include physical violence or psychological or physical intimidation. Second, whereas with other forms of mistreatment, such as bullying, aggression, or social undermining, the intent to harm the target is clear, with workplace incivility the intentionality is less apparent. Indeed, the definition of incivility implies that the actions of the perpetrator rather than a desire to cause harm (Andersson & Pearson, 1999) may reflect indifference, unawareness, or oversight (Tepper & Henle, 2011). Third, incivility refers to a non-systematic phenomenon. This represents a clear distinction from bullying, which refers to hostile behaviours systematically perpetrated during an extended period (Nielsen, Hetland, Matthiesen, & Einarsen, 2012).

Although much attention has understandably been paid to high-intensity forms of mistreatment, a growing body of research – mostly using cross-sectional designs – is increasingly highlighting the unique and harmful effects of co-worker incivility (Cortina, Kabat-Farr, Magley, & Nelson, 2017; Schilpzand, De Pater, & Erez, 2016). According to this corpus of literature, experiencing co-worker incivility leads to increased exhaustion (Fida, Laschinger, & Leiter, 2017; Hur, Kim, & Park, 2015) and turnover intent, as well as deteriorated job satisfaction (Lim, Cortina, & Magley, 2008) and commitment (Taylor, Bedeian, & Kluemper, 2012). Several studies demonstrated that incivility also has the potential to spiral into increasingly deviant behaviours that may undermine the social climate in the organisation. For example, Torkelson, Holm, Bäckström, and Schad (2016) found an association between experienced incivility from co-workers and instigated incivility. This and similar studies have provided evidence for the Andersson and Pearson model (1999) which describe workplace incivility, through a social exchange perspective, as social interactions in the form of a spiral of reciprocal interpersonal conflicts.

However, in spite of the considerable number of studies on co-worker incivility, knowledge on this topic needs to be further enhanced. Many studies have focused on shedding light on

the reciprocal nature of incivility in the victim–perpetrator dyad, recognising in it the main mechanism responsible for the spreading of rude behaviours in the workplace (Cortina et al., 2017). However, no studies have focused on the reciprocal nature of the relationship of incivility with other important aspects of working life, i.e. employee well-being and the quality of the working process. The present study, employing a one-year cross-lagged design, aims to fill these gaps by examining the cross-lagged relationships among co-worker incivility, work-related exhaustion, and organisational efficiency.

Exhaustion is one of the most used concepts in OHP research to describe the employee well-being experience, and it has also been employed to study the relationship between incivility and well-being. In this literature, scholars – based mostly on cross-sectional design study findings – theorised that incivility negatively affects well-being. However, some processual theories, such as the conservation of resources theory (COR, Hobfoll, 1989), emphasise the reciprocal nature of the stress process, suggesting the plausibility of the opposite path as well, i.e. higher level of exhaustion may lead the employee to a higher co-worker incivility exposure. Moreover, the opposite path is indirectly suggested by the selective incivility theory (Cortina, 2008) which states that some people, reporting certain characteristics (e.g. gender, adiposity, Sliter, Sliter, Withrow, & Jex, 2012a) or also certain emotional states (e.g. state of anxiety, Milam, Spitzmueller, & Penney, 2009), are more prone to perceiving and experiencing incivility than others.

In comparison to employee well-being, variables describing organisational processes have received little attention in studies focused on examining the correlates of coworker incivility (Schilpzand et al., 2016). Organisational efficiency, in particular, has not been previously studied in terms of its association with incivility. According to Arnetz, Lucas, and Arnetz (2011), organisational efficiency may be defined as the employees' perception of how well work processes function at their workplace. It includes an evaluation about decision-making processes, how work is planned, and the degree to which goals are shared. Generally speaking, in OHP studies, organisational efficiency has rarely been taken into account. This is despite the fact that Arnetz et al. (2011) found that it plays a crucial role in the mechanism that links variables describing organisational climate and the mental health of workers.

Pearson and Porath (2009) mentioned organisational efficiency as a key variable to understanding the link between incivility and the quality of the working process. Even though not directly investigated, literature has suggested the plausibility for both the directions of the relationship between these two variables. On the one hand, Pearson and Porath (2009) stated that reduced efficiency represents one of the most relevant consequences of co-worker incivility. They estimated that the cost of co-worker incivility is mostly related to inefficiency – for example, poor communication among co-workers and delay – and amounts to approximately $14,000 per employee annually. On the other hand, there were cross-sectional studies, which assumed the predicting role of incivility on the perception of the work environment (e.g. Holm, Torkelson, & Bäckström, 2015).

The adoption of a purely static or "snapshot" approach in studying incivility in the relationship with job well-being or the quality of the working process has been recently argued in a recent review by Cortina et al. (2017) who have encouraged scholars to employ a

timed-lagged design, instead of the cross-sectional study design. Indeed, based on the current literature, it is not possible to establish whether co-worker incivility has reciprocal or unidirectional relationships over time with both work-related exhaustion and organisational efficiency. In this view, studies aimed at analysing the relationship in both directions among these variables would help to identify unknown vicious cycles responsible for the strengthening of incivility in organisations.

A further limitation of the current literature is the paucity of studies aimed at examining the long-term relationships of incivility with aspects describing both job well-being and the quality of the working process. The use of diary study designs has led to some advancements, mainly in terms of identifying some very short-term effects of incivility on employee well-being. For example, Beattie and Griffin (2014) examined intra-individual daily fluctuations over four weeks, two times a week, and found that strain was higher and engagement was lower on the days when a worker experienced incivility compared to the days when incivility was not experienced. Cortina et al. (2017), considering the “fuzzy” nature of incivility, observed that long-time frames may be more appropriate than short ones. The ambiguous and low-intensity nature of incivility behaviours might lead individuals to require time to recognise and, thus, to process them. Moreover, the stabilisation of a reciprocal relationship, thus leading to a creation of a loss spiral, might take time. For example, Kim, Cohen, and Panter (2016) in a study aimed at examining the reciprocal relationship between experienced mistreatment and counterproductive work behaviours over 12 weeks did not find the role of organisational support in moderating this relationship. This may be because the effect of the quality of the organisational environment on this type of employee behaviours may not emerge in such a short period. However, it is plausible that as the time lag is expanded, the effect may appear.

In this view, findings from the present study, which employ a one-year cross-lagged design, might contribute to better understanding the findings from previous studies. In particular, our study may contribute to the determination of how persistent and pervasive the effects of co-worker incivility are over time. In addition, the present study may expand knowledge as it may identify new early precursors of incivility.

Finally, the present study would contribute to better understanding the unique contribution of incivility in determining detrimental effects on employees and the organisation, after controlling for higher-intensity forms of mistreatment, such as bullying. Even though as pointed out above, from a theoretical point of view, there are certain characteristics that allow scholars to clearly distinguish incivility from bullying, it is also true that to some extent the two constructs overlap as they both refer to the experience of psychological aggression (Schilpzand et al., 2016). Moreover, according to the Hershcovis’ review (2011), there is an overlap between incivility and bullying, also regarding predictors and outcomes. In particular, exhaustion was found to be a consequence of both the forms of aggression (Fida et al., 2017). Studies in the literature aimed at identifying incivility correlates usually fail to control for the effects of higher-intensity forms of mistreatment coming from the same source and/or other sources (e.g. from supervisors or patients). This has made it difficult to recognise the unique effect of incivility on the “net” of bullying. For instance, there is a chance that a high co-worker incivility score might hide the presence of bullying

(Hershcovis, 2011). In this view, it is possible that the significance of the associations of incivility with exhaustion or efficiency could be biased due to the presence of undetected bullying, which may contribute to inflating them. However, bullying from other sources may also distort findings in this regard. Therefore, the present study chose to include, as control variables, bullying from three different sources: coworkers, supervisors, and clients (i.e. patients and/or their relatives). Findings may contribute to a clearer establishment of the real strength of the association of co-worker incivility with variables under study.

Theoretical background and study hypotheses

The current study uses COR (Hobfoll, 1989) theory as a theoretical framework. COR is a motivational theory that states that individuals are primarily motivated to obtain, retain, foster, and protect the things they value (Hobfoll, 1989). An important added value of COR theory is the description of the spiralling loss process that can be applied to understand the phenomenon of occupational stress in a psychosocial perspective (Hobfoll & Shirom, 2001). As Hobfoll (1989) has explained, a loss spiral refers to a process of expense of resources that makes them unavailable to cope with future loss, thus potentially leading to further resource loss. COR theory (Hobfoll, 1989) envisions loss processes as a film, not a snapshot, emphasising that such processes tend to have a cyclic nature. Fewer resources lead to a diminished ability to obtain, maintain, and gain resources, thus creating a vicious cycle that over time becomes even more difficult to break. This implies that the relationships among the variables in a loss spiral are more than unidirectional and tend to be reciprocal (Hobfoll, 1989). Reciprocal causations are supported in many studies, particularly those that investigate motivational processes in workplace settings. For instance, Simbula, Guglielmi, and Schaufeli (2011) conducted a three-wave study on teachers and found that job resources (i.e. support from colleagues, support from supervisors, and opportunities for development) and work engagement affect each other reciprocally. Salanova, Bakker, and Llorens (2006) conducted a two-wave study and found evidence of reciprocal associations between some organisational resources (i.e. social support climate and clear goals) and flow at work. We therefore suggest that each of the variables considered in the present study (i.e. co-worker incivility, organisational efficiency, and exhaustion) may work as both an initiator of the loss spiral and as an effect on each of the other variables.

The association between co-worker incivility and exhaustion

From an empirical point of view, exhaustion has been found to be critical in understanding the psychological experience associated with incivility (Hur et al., 2015). A recent study by Fida et al. (2017) provided evidence for the predicting role of incivility on exhaustion at a distance of one year. However, even though previous studies have investigated exhaustion to merely be an outcome of incivility, based on COR theory (Hobfoll, 1989), it is not possible to exclude a reciprocal influence of these constructs over time.

Co-worker incivility is certainly a stressor; therefore, it can be hypothesised to be an initiator of a loss process in the workplace (Hobfoll, 1989). In fact, incivility may cause the target to deplete a considerable amount of energy as a consequence of the difficulty of carrying out

the job in a hostile social environment. Over time, the mobilisation of additional effort to compensate for these difficulties may lead to a state of chronic exhaustion.

It is also possible that being exhausted, in addition to being a reaction to incivility, may expose one to the risk of becoming a target of incivility. Exhaustion can be defined as a long-term, end state of the process of resource loss (Hobfoll & Shirom, 2001). In view of this, a state of impoverished resources may cause an employee to experience future losses, including being exposed to co-worker incivility due to his/her vulnerability as a result of diminished resources in terms of energy. This is consistent with COR theory (Hobfoll, 1989), according to which those with fewer resources (including energy) are more vulnerable to resource loss and are less capable of acquiring resources. Based on this, we hypothesise that:

(H1) Co-worker incivility has a positive cross-lagged effect on exhaustion.

(H1r) Exhaustion has a positive cross-lagged effect on co-worker incivility.

The association between co-worker incivility and organisational efficiency

In COR terms, organisational efficiency can be seen as an organisational resource. According to Hobfoll (1989), resources are those objects, energies, or conditions that have a value in their own right or that are valued because they help in acquiring or protecting valued resources. According to Demerouti, Bakker, Nachreiner, and Schaufeli (2001), organisational resources in workplaces are those aspects of the work environment that help in achieving work goals or in reducing workers' physiological and psychological costs.

COR theory suggests that both incivility and reduced organisational efficiency may work as initiators of a loss process and also as outcomes of this same process. Low organisational efficiency represents a condition of poor resources that may lead to further loss. In this view, a possible ramification may be the development of incivility. For example, incivility may arise as a result of co-workers having different visions regarding how to provide a service (Hamblin et al., 2015). In a work context in which the perception of being targeted for incivility is prevalent, organisational efficiency may also be hindered by undermining the conditions for sharing common goals or for planning work effectively. Based on this, we formulate the following hypotheses:

(H2) Co-worker incivility has a negative cross-lagged effect on organisational efficiency.

(H2r) Organisational efficiency has a negative cross-lagged effect on co-worker incivility.

The association between organisational efficiency and exhaustion

The principle of loss spiral suggests a reciprocal relationship between these two variables. In a context in which efficiency is reduced, an employee may deplete an excessive amount of energy in the effort to respond to the demands posed by the work in adverse organisational conditions (Hobfoll & Shirom, 2001). This situation may lead the worker to develop exhaustion symptoms.

In turn, the higher level of exhaustion among employees may compromise the quality of the working process as well. A possible explanation for reversed causal effects is that the exhausted employees tended to negatively evaluate their work conditions, thus creating a negative work climate (Bakker & Schaufeli, 2000).

From an empirical point of view, previous cross-sectional studies have suggested a negative association between these two variables (Arnetz et al., 2011). Even though the reciprocal relationships between efficiency and exhaustion have never been tested, there is evidence that suggests its plausibility. In their review, Zapf, Dormann, and Frese (1996) identified 6 out of 16 longitudinal studies, which showed reversed causal relationships between working conditions and strain. More recently, Angelo and Chambel (2015), in a two-wave cross-lagged study on a sample of firefighters, found a reciprocal relationship between organisational psychosocial characteristics and burnout.

Accordingly, we postulate that:

(H3) Organisational efficiency has a negative cross-lagged effect on exhaustion.

(H3r) Work-related exhaustion has a negative cross-lagged effect on organisational efficiency.

Method

Participants and procedure

A two-wave study was conducted in a hospital system in metropolitan Detroit, Michigan, USA, comprised seven hospitals and approximately 15,000 employees. Questionnaires were distributed to employees of 41 work units, as part of a research-intervention on workplace violence that included incivility. Data were collected at two time points, pre- (April 2013) and post-intervention (April 2014). Questionnaires were mailed to the home addresses of employees, along with a postage-paid return envelope. Thank you notes and $10 gift cards were mailed to the home addresses of respondents. Ethical approval for this study was granted by the Human Investigation Committee of the University and the Research Review Council of the hospital system.

In 2013 (Time 1), 2010 self-report questionnaires were sent. A total of 446 (22.2%) workers responded to the survey. One year later (Time 2), the survey was repeated. Of the 446 workers who responded at Time 1, 332 were eligible to take part in the second wave. This was because 42 (9.4%) of those who responded at Time 1 were transferred to other sites and 72 (16.1%) had left the hospital system. Of the 332 workers, 171 (48.5%) completed the second questionnaire. However, since the present study utilised a multilevel approach to control for the nested nature of the data, 11 participants belonging to singleton clusters were dropped. According to Clarke and Wheaton (2007), the inclusion of singleton groups in the multilevel model may increase the bias in the variance estimates. Therefore, the final sample consisted of 155 respondents from 28 units (M_{size} = 5.53). The total dropout rate from Time 1 to Time 2 was 65.2% (n = 291).

To control for potential selection bias associated with dropout at Time 2, statistical differences regarding demographic characteristics (i.e. gender, age, occupation, and tenure at DMC), forms of bullying experienced (i.e. supervisors, patients/visitors, coworkers), and study variables (i.e. co-worker incivility, exhaustion, and organisational efficiency) were assessed by comparing the panel (n = 155) and the dropout group (n = 291). According to the χ^2-test, no significant differences were observed, except for the variable bullying by patients/visitors since on this variable dropouts were found to be significantly more exposed rather than the panel group (χ^2 = 5.33, p = .02). Moreover, according to the t-tests, no significant change was observed in any variable between the panel group at T1 (n = 155) and the dropout group (n = 291). An elaborate analysis of the dropouts as well as sample characteristics at both times can be obtained from the corresponding author.

Questionnaire

The same self-report questionnaire was administered at both time points. The questionnaire was developed for this study and utilised the following subscales.

Co-worker incivility was measured using the Interpersonal Conflict scale developed by Spector and Jex (1998) and modified by Sliter, Sliter, and Jex (2012b). It contains four items aimed at capturing the frequency with which workers perceived themselves to be targets of incivility by co-workers during the past year (e.g. “How often do co-workers ignore or exclude you at work”?). A 5-point Likert scale was used to measure the responses, ranging from 1 (“never”) to 5 (“always”).

Work-related exhaustion was measured using a subscale from the Quality Work Competence (QWC) questionnaire (Arnetz et al., 2011). It consisted of three items aimed at assessing how often respondents reported feelings of emptiness or exhaustion after work or were fatigued when thinking about work (e.g. “I feel emotionally drained after work”). A 5-point Likert scale was used to measure the responses, ranging from 1 (“never”) to 5 (“daily”).

Organisational efficiency was also measured using a subscale adapted from the QWC questionnaire (Arnetz et al., 2011). It consisted of three items focusing on the employee’s perception of how well work processes function at their workplace (e.g. “At my workplace the decision-making process works well”). A 4-point Likert scale was used to measure the responses, ranging from 1 (“strongly agree”) to 4 (“strongly disagree”).

Control variables

Information regarding *bullying exposure by co-worker, supervisor, and patient/visitor* were obtained using the two following items (Nielsen et al., 2012): (1) “Have you been bullied at work during the past year”? (response options: “yes”/”no”); (2) and “Who bullied you”? (response options: “patients/visitors,” “manager/supervisor,” “co-worker,” and “others”). Participants were asked to respond considering the following definition of bullying: “A person is bullied when they are exposed, repeatedly and over time, to physical and/or psychological mistreatment by another person or persons.” From the information collected using the above-described questions, three couples (Time 1 and Time 2) of dichotomous variables (0 = not reported exposure; 1 = exposure reported) for each bullying source (bullying by co-worker; bullying by supervisor; bullying by patient/visitor) were

constructed. Finally, the questionnaire also contained questions aimed at collecting background information (i.e. gender, age, occupation, and job tenure in the hospital system).

Data analysis strategies

Data analyses were performed using IBM Statistical Package for the Social Sciences 22 (SPSS) and Mplus 7.31. Due to non-independence in the data stemming from nesting of individual workers within units, the between-unit variability of the individual perceptions regarding the study variables was calculated by intraclass correlation coefficients ($ICC_{(1)}$). Well-established cut-off values for ICC are not available. However, some recommendations were provided. James (1982) proposed .12 as a possible cut-off. According to Bliese (2000), values of $ICC_{(1)}$ which justify aggregation, range between .05 and .20. More recently, LeBreton and Senter (2008) suggested to consider .01 a small effect, .10 a medium effect, and .25 a large effect. In our sample, at Time 1, $ICC_{(1)}$ were: for incivility .04 at Time 1 and .09 at Time 2, for exhaustion .16 at Time 1 and .03 at Time 2, and for efficiency .09 at Time 1 and .05 at Time 2. Also considering the Bliese (2000) range which is the less restrictive, two of the six measures showed low levels of between-unit variance. Overall, the findings suggested that it might be appropriate to examine relations among variables at the individual level only. However, considering the risk that the nesting nature of the data can bias the coefficient estimation at the individual level (Bliese, 2000), in the present study we control for the unit-level nesting effect employing a multilevel approach.

In order to ascertain the adequacy of the psychometric properties and the reliability of the research instruments over time, Cronbach's alpha (α) and a series of Multilevel Confirmatory Factor Analyses (MCFAs) were performed for the two measurement points separately. Specifically, to determine that the best structure for the data was the one hypothesised, three competing models were compared: (a) a one-factor model in which all items loaded on one factor; (b) a two-factor model in which the co-worker incivility items loaded on one factor and the rest of the items on the other factor; and (c) a three-factor model including three latent variables – co-worker incivility, exhaustion, and organisational efficiency – in which component items loaded on their respective corresponding factor (the hypothesised model).

Since no serious violations from the normality distribution were found (all the skewness and kurtosis values of the variables considered were within ±1), Maximum Likelihood (ML) was employed as an estimation method. The nesting of individuals within groups was accounted for using the type = two level MPlus command and identifying the unit as a cluster variable.

The goodness-of-fit of the models was assessed using the ratio of χ^2 to the degrees of freedom (df), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Squared Residual (SRMR). According to Kline (2005), a χ^2/df ratio of 3 or less indicates a good model fit, and less than 2 indicates an excellent model fit. For TLI and CFI indices, values equal or higher than .95 are considered an indicator of excellent model fit (Bentler, 1995). A value of RMSEA and SRMR equal or lower than .09 indicates acceptable model fit (Byrne, 1998). In addition, Akaike Information Criterion (AIC) and Bayes Information Criterion

(BIC) were used to compare the alternative (non-nested) measurement models (Kline, 2005). For the AIC and BIC, smaller values are indicative of better fitting models.

Descriptive statistics included means, standard deviations, *t*-test, and correlations among subscales within each wave and across the two waves. Study hypotheses were examined by means of cross-lagged modelling techniques (Structural Equation Modeling, i.e. SEM, estimation method: ML). Also in this case, in order to control for the nesting nature of the data, each model was estimated both at within (individual) and at between (unit) level. In particular, four models were compared with each other: (1) the *stability model*, which includes the autoregressive paths between the same latent variables measured at different times and the synchronous correlations between the variables measured at the same time; (2) the causality model, which includes all the paths of the stability model plus the regressive path(s) referred to in H1, H2, and H3; (3) the *reverse causation model*, which includes all the paths of the stability model plus the regressive path(s) referred to in H1r, H2r, H3r; and (4) the *reciprocity model*, which includes all the paths included in the previous three models. The final model (i.e. the one showing the best fit) was adjusted for the effects of the three forms of bullying (i.e. co-worker, supervisor, and visitors/patients) to strengthen the validity of the results. In particular, the three forms of bullying measured at Time 1 were regressed on the three major study variables measured at both Time 1 and Time 2, whereas the three forms of bullying measured at Time 2 were regressed only on the major study variables measured at Time 2. Also in this case, the fit of the model was assessed with the χ^2/df ratio, CFI, TLI, and RMSEA. In addition, whereas the chi-square difference test ($\Delta\chi^2$) was used to compare nested models, AIC and BIC were used to compare non-nested models (Kline, 2005).

Results

Descriptive analyses

Table 1 reports Pearson's correlations of study variables within and between waves both an individual and unit levels. All the correlations among variables between and within waves showed significant associations in the expected direction. In particular, all the variables considered in the study showed acceptable stability over time, since all pairs reported relatively high *r* values both at the individual and at the unit levels ($.52 \leq r \leq .75$).

Moreover, *t*-tests did not highlight statistical differences for each pair of variables measured at different times. Cronbach's alphas (α) confirmed the good internal consistency of the scales at both individual and unit levels.

Finally, according to the MANOVAs within and between panels, none of the demographic (i.e. gender and age) or occupational (i.e. occupation, tenure at the hospital) variables showed significant relationships with the constructs under study (i.e. incivility, exhaustion, and efficiency). On the other hand, levels of incivility and exhaustion both at Time 1 and at Time 2 were significantly higher among those who were targets of the three forms of bullying at both times. Likewise, efficiency was significantly lower among those who experienced bullying from any of the three sources at both times.

Measurement model

Table 2 presents the fit indices of the MCFAs. The hypothesised measurement model consisting of three correlated latent factors showed the best fit at both measurement times (i.e. M3a and M3b). AIC and BIC confirmed that this three-factor model fits the data better than the alternative models with one and two factors, respectively. However, SRMR indicated that the solution was satisfactory at the individual level but not at the unit level. This result further confirmed the suitability of our choice to focus on the individual level to test study hypothesis.

At the individual level, all items in the three-factor model loaded significantly on their corresponding latent factors in both time surveys. Moreover, all the latent factors showed significant correlations.

Cross-lagged associations

Table 3 reports the goodness-of-fit indices for the multilevel cross-lagged SEMs performed to test the causal relationships among the variables under study at the individual level, while controlling for the possible confounding influence of variance at the unit level on our results. In these analyses, no paths concerning our study hypotheses were found to be statistically significant at the unit level of analyses. Also in consideration of the poor value obtained on SRMR-between (Table 3), unit-level paths were no further described.

M1, the stability model, showed acceptable values on the goodness-of-fit indexes, excepting from SRMR at the unit level. At the individual level, all paths had significant values ($\gamma_{\text{incivilityT1->T2}} = .81$, $p = .001$; $\gamma_{\text{exhaustionT1->T2}} = .76$, $p = .001$; $\beta_{\text{efficiencyT1->T2}} = .62$, $p = .001$).

From the stability model to the causality model (M2), the adding of six paths – three at an individual level and three at the unit level – resulted in a significant increase in the chi-square ($\Delta\chi^2 = 22.83$, $p = .001$). At the individual level, the paths incivility T1 to exhaustion T2 ($\gamma = .19$, $p = .002$), and incivility T1 to efficiency T2 ($\gamma = -.21$, $p = .01$) were found to be significant. Conversely, the path efficiency T1 to exhaustion T2 did not reach a significant value ($\gamma = -.03$, $p = .61$).

The reverse model (M3) also showed a better fit when compared with the causality model ($\chi^2/df_{M2} = 1.06$ vs. $\chi^2/df_{M3} = 1.05$). Moreover, the reverse model reported a significant delta chi-square when compared with the stability model, M1 ($\Delta\chi^2 = 20.94$, $p = .002$). By inspecting the paths, the cross-lagged association efficiency T1 to incivility T2 ($\gamma = -.21$, $p = .003$) and exhaustion T1 to efficiency T2 ($\gamma = -.22$, $p = .01$) were found to be significant. The path from exhaustion T1 to incivility T2 was not significant.

The reciprocal model (M4, Figure 1) showed the best fit to the data ($\Delta\chi^2_{M3-M4} = 13.22$, $p = .04$). At the individual level, four paths reported significant values: incivility T1 to exhaustion T2 ($\gamma = .19$, $p = .001$, H1 supported), incivility T1 to efficiency T2 ($\gamma = -.18$, $p = .02$, H2 supported), efficiency T1 to incivility T2 ($\gamma = -.21$, $p = .003$, H2r supported), and exhaustion T1 to efficiency T2 ($\gamma = -.17$, $p = .04$, H3r supported). However, at the individual level, no significant values were found regarding the paths exhaustion T1 to

incivility T2 and efficiency T1 to exhaustion T2, leading to disconfirm H1r and H3, respectively.

Finally, to further strengthen the validity of the results obtained, the path obtained at the individual level was controlled for the effect of three variables measured at both times: bullying exposure from co-workers, superiors, and patients/visitors. The last line of Table 3 reports the goodness-of-fit indices of this model (M4a). The non-controlled model (M4), if compared with the controlled model (M4a), showed lower values on AIC and BIC, suggesting that the adding of the control variables slightly worsen the model fit. However, the global fit was acceptable, except for the unit-level SRMR. Figure 1 reported the individual level cross-lagged associations found in the M4a, which were analogous to those obtained in the non-controlled model (in terms of directions and significance). Furthermore, regarding control variables, 10 paths of the 27 estimated were found to be significant: bullying by co-workers at Time 1 showed a significant positive association with incivility (γ = .35, p = .001) and exhaustion (γ = .19, p = .02) at Time 1 and with incivility at Time 2 (γ = .23, p = .001); on the other hand, bullying by co-workers at Time 1 showed a negative association with efficiency at Time 1 (γ = .19, p = .02). Moreover, bullying by a superior at Time 1 significantly affected co-worker incivility at Time 1 (γ = .40, p = .001), exhaustion at Time 1 (γ = .17, p = .04), and efficiency at Time 2 (γ = −.19, p = .02), and bullying by a superior at Time 2 significantly affected both co-worker incivility (γ = .16, p = .01) and efficiency at Time 2 (γ = −.19, p = .02). Bullying by patients/visitors at Time 1 affected co-worker incivility at Time 1 (γ = .14, p = .05). Overall, these results obtained in model M4a further confirmed H1, H2, H2r, and H3r but not H1r and H3.

Further analyses

The significance of the paths incivility T1 -> exhaustion T2, exhaustion T1 -> efficiency T2, and incivility T1 -> efficiency T2 obtained in the cross-lagged analyses suggested the indirect effect (IE) of incivility on efficiency via exhaustion (Baron & Kenny, 1986). Therefore, in order to provide additional evidence in favour of the mediating role of exhaustion in this relationship, we estimated the IE on two different models. The first model included the paths Incivility T1->Exhaustion T1, Exhaustion T1->Efficiency T2, Incivility T1->Efficiency T2 (M1), and the second included the paths Incivility T1->Exhaustion T2, Exhaustion T2->Efficiency T2, Incivility T1->Efficiency T2 (M2). As no paths at the unit level were found to be significant in the cross-lagged analyses, the present analyses were carried out using a SEM approach considering the individual level only. However, because participants were nested within units, the Mplus Type = complex syntax, indicating “unit” as cluster variable, was employed to account for non-independence. Confidence intervals for IE were calculated using the Monte Carlo resampling method (Bauer, Preacher, & Gil, 2006) through the Rweb utility (20,000 iterations, 95% confidence level) developed by Selig and Preacher (2008).

M1 showed a satisfactory fit to the data (χ^2 = 45.60; df = 32; χ^2/df = 1.42; CFI = .98; TLI = .97; RMSEA = .05; SRMR = .03). The paths from incivility T1 to exhaustion T1 (γ = .32, p < .001) and the path from exhaustion T1 to efficiency T2 (β = −.34, p < .001) were found to be significant. On the contrary, the path from incivility T1 to efficiency T2 (γ = −.18, p

= .18) showed a non-significance value, suggesting the presence of a full mediation. The mediating role of exhaustion between incivility and efficiency was further confirmed by the significance of the indirect effect (IE = −.10, p = .005, CI: Lower = −.17, Upper = −.04) calculated using the Monte Carlo procedure.

M2 showed an excellent fit (χ^2 = 35.10; df = 32; χ^2/df = 1.09; CFI = .99; TLI = .99; RMSEA = .03; SRMR = .03). Whereas the paths from incivility T1 to exhaustion T1 (γ = .41, p < .001) and the path from exhaustion T1 to efficiency T2 (β = −.35, p < .001) were found to be significant, the path from incivility T1 to efficiency T2 (γ = −.15, p = .27) did not. The mediating role of exhaustion between incivility and efficiency was further confirmed by the significance of the indirect effect (IE = − .13, p = .003, CI: Lower = −.22, Upper = −.05).

Discussion

The aim of the present study was to examine the cross-lagged associations among coworker incivility, work-related exhaustion, and organisational efficiency measured at an interval of one year. Based on the COR theory (Hobfoll, 1989), we proposed that these variables reciprocally affect each other over time. To the best of our knowledge, our study is the first to examine reciprocal relationships among these variables.

The findings partially supported the hypotheses. Of the six hypotheses formulated, our findings support four and reject two. Regarding the relationship between incivility and exhaustion, our findings support the hypothesis that incivility causes exhaustion. On the other hand, the opposite causation was not supported. The first finding in is line with evidence from a previous study (Fida et al., 2017), reporting the presence of a long-lasting effect of incivility on target well-being. Even though the significant effect of incivility on exhaustion measured at one year of distance is not new in the literature (Fida et al., 2017), to our best knowledge, it is the first time that a cross-lagged design was employed, permitting to control this causal relationship for the opposite path (Cortina et al., 2017). Therefore, the present study decisively contributes to the current literature by highlighting that whereas incivility is a mild form of mistreatment, it does not mean that its effects are also mild. On the contrary, its consequences are observed to be equally serious and long-lasting as those of higher-intensity forms of mistreatment, such as bullying. In this view, the present study further confirms that incivility represents a significant risk in the workplace that needs as much attention as more overt forms (Hershcovis, 2011). As noted by Sliter et al. (2012b), because stronger forms of mistreatment are comparatively infrequent and easy to identify, their consequences are more likely to be addressed. However, the harmful potential of incivility lies in the high frequency and in the partial invisibility that increases the risk of a silent accumulation of negative effects over time.

The path exhaustion to incivility was found to be not significant. The role of a target's negative emotional state in eliciting incivility has been rarely investigated, although previous studies have suggested this line of inquiry could be promising. For example, Milam et al. (2009) observed that neuroticism (self- or hetero- reported) is associated with experienced incivility. However, it is possible that neuroticism may provoke incivility because it may be

perceived as a disagreeable personality trait, whereas signs of exhaustion (e.g. tiredness or sickness) may not be perceived as unpleasant and may even elicit other kinds of reactions, such as compassion. This is also in line with the theory of selective incivility (Cortina, 2008), which assumes that stigmatised identities are more prone to experiencing incivility in a work context. Whereas in certain work contexts employees who show strain symptoms may be at more risk of stigmatisation (Kunda, 2009), this might not be the case of the healthcare sector, the work setting of the present study sample. This can be due to the fact that levels of exhaustion are in average quite high in this work context (e.g. Loera, Converso, & Viotti, 2014), increasing the tolerance towards employees who report strain symptoms. Future studies may examine whether high levels of exhaustion affect the likelihood to incur incivility in other types of work contexts/cultures.

Another explanation for not finding this path significant is that one year might be a non-appropriate time lag for examining this association. Incivility, representing a non-premeditative form of aggression may be the result of a transitory anger of the instigator that may disappear in few hours (Potegal, 2010) or, at least, in few days (Bies & Tripp, 2005). Therefore, incivility may be a short-term rather than a long-term effect of exhaustion. Moreover, exhaustion, different from neuroticism, is not a stable trait, and studies have demonstrated that it may vary over days (Gross et al., 2011). Accordingly, individuals may be at greater risk of incivility on days when they feel exhausted than on days when they feel rested (Meier & Gross, 2015). Future studies may employ diary studies in order to understand whether exhaustion may work as a short-term predictor of experienced incivility. As noted by Schilpzand et al. (2016), future studies may also help to improve our knowledge by focusing on cross-lagged associations of incivility with target behaviours, such as job performance, or attitudes, such as pessimism, in order to understand whether these aspects may invite incivility.

The only dyad relationship in which variables were shown to reciprocally affect each other over time was between co-worker incivility and organisational efficiency. Previous studies investigated the role of variables describing organisational processes in cross-sectional studies, in some cases assuming them to be incivility antecedents and in other cases incivility outcomes. The present study clarifies that organisational efficiency functions both as incivility cause and consequence, thus shedding light on the key role of organisational efficiency in understanding the incivility phenomenon. In accordance with our hypothesis built on the COR theory (Hobfoll, 1989), our findings showed that both incivility and efficiency work as an initiator, creating a loss spiral in which the two elements reinforce each other over time, determining negative consequences both at a relational and an organisational level. Regarding this bidirectional association, it is also interesting to note that the path from organisational efficiency to incivility was found to be stronger ($\beta = -.22$) than its opposite ($\beta = -.19$). This result can be interpreted in the light of COR theory (Hobfoll, 1989), which assumes that loss cycles will occur quickly and powerfully, suggesting that at each interaction of loss in the sequence, the cycle will gain in strength and momentum. According to this, it is possible to suppose that the path from incivility to efficiency chronologically proceeds the opposite path and therefore that incivility may be considered the first initiator of this vicious cycle that involves these two variables. Even though this conjecture is suggestive, caution must be exercised in interpreting results in this direction, as

this specific assumption of COR theory (Hobfoll, 1989) has rarely been tested. Future studies employing designs with three or more waves may confirm or reject this explanation. This finding of the bidirectional association between incivility and efficiency has also important theoretical implications in the incivility literature as it suggests expansion of current theoretical models that explain the incivility phenomenon using an interpersonal exchange perspective (Andersson & Pearson, 1999; Tedeschi & Felson, 1994), in order to also account for the complex role of the variables describing the quality of the working process.

First, this novel finding adds to the theoretical knowledge about a to-date unrecognised mechanism responsible for the development of incivility in the workplace. Earlier research tended to pay attention almost exclusively to personal variables (Milam et al., 2009; Sliter et al., 2012a) and social norms (Gallus, Bunk, Matthews, Barnes-Farrell, & Magley, 2014) as possible precursors of incivility. The significance of the path from efficiency to incivility suggests that referring to the *work environment assumption* (Nielsen et al., 2012) may be useful in developing studies aimed at understanding the roots of incivility (Mikaelian & Stanley, 2016). With this assumption, Nielsen et al. (2012) propose that workplace aggression was primarily caused by factors related to deficiencies in work design and organisation. Whereas for bullying this assumption is supported by longitudinal evidence (e.g. Baillien, Rodriguez-Munoz, Van den Broeck, & De Witte, 2011), regarding incivility the present study represents one of the first to provide evidence (Schilpzand et al., 2016). Further research may help to further understand the mechanism linking efficiency and incivility by studying possible precursors or moderators of this relationship. For example, studies recognised authentic leadership as a key factor in the workplace aggression literature as it may contribute to diminish and incivility (Fida et al., 2017). Authentic leadership is a positive relationship-focused leadership style that emphasises self-awareness, honesty and transparency, behavioural integrity, and consistency (Avolio & Gardner, 2005). In order to further advance understanding of the process that generates incivility in the workplace, it would be helpful to test whether authentic leadership helps to enhance organisational efficiency, and in turn, to diminish incivility.

Second, our study confirms the previous cross-sectional literature which has suggested that incivility represents a cost for the organisations (Pearson & Porath, 2009). Previous research found that incivility negatively affects short-term job productivity, by hampering performance (Rhee, Hur, & Kim, 2017), creativity, and memory recall process (Porath & Erez, 2007). Our study adds that organisational efficiency represents a long-term consequence of incivility. This finding demonstrates how serious the consequences of incivility are in the organisation, being measurable at a distance of one year. However, an aspect that future study may help to elucidate regards the mechanism by which incivility undermines organisational efficiency. Following the Andersson and Pearson theory (1999), this mechanism might have to do with the so-called tit-for-tat spiral. The authors, based on the interactional perspective (Tedeschi & Felson, 1994), postulate how one instance of incivility can trigger a series of uncivil exchanges between the instigator and the target. Formerly, Andersson and Pearson (1999) proposed that the tit-for-tat spiral consisted of an escalation of even more intense forms of violence. However, subsequent research demonstrated that incivility instigation is not the only way in which employees respond to

incivility (Cortina et al., 2017). Experiencing incivility may lead an individual to put into action other types of antisocial behaviours towards the perpetrator such as failing to share work information, to sabotage a project, to avoid collaborating or providing help if needed (Spector & Fox, 2005). The reiteration of these dysfunctional behaviours may lead to diminished organisational efficiency over time. Moreover, more recent studies demonstrated that the reciprocation might go beyond the victim/perpetrator dyad, suggesting that the proliferation of incivility and its consequences may rapidly pervade the entire organisation (Cortina et al., 2017). For instance, Porath and Erez (2007), in an experimental study, found that after incivility exposure, people became less prone to put into action helpful behaviours towards others, whether they were involved in the incivility perpetration or not. Future studies, combining longitudinal design and network analyses techniques, may clarify whether and how the link between incivility and efficiency has to do with mechanisms identified by the aforementioned studies (Miner et al. 2017).

Finally, the relationship between efficiency and exhaustion was also not found to be reciprocal, as the only significant path was the one from exhaustion to efficiency. The lack of significance of the path from efficiency to exhaustion is difficult to explain. This finding is also contrary to the results of previous studies that, even though they are cross-sectional, provided evidence of the predictive role (mediated by stress) of efficiency on mental health (Arnetz et al., 2011). Future cross-lagged studies aimed at replicating these analyses and involving larger samples may help to better elucidate the relationship between efficiency and exhaustion.

Moreover, the significance of the path from exhaustion to efficiency, together with the significance of the paths from incivility to exhaustion and from incivility to efficiency, suggests the presence of the mediating role of exhaustion in the relationship between incivility and efficiency (Baron & Kenny, 1986; Cole & Maxwell, 2003). This was also confirmed by further mediational analysis, which has highlighted the presence of an indirect effect via exhaustion between incivility measured at Time 1 and efficiency measured at Time 2. To definitely prove this hypothesis, a cross-lagged three-wave study design must be conducted; these results are congruent with the principle of the loss spirals (Hobfoll, 1989): experiencing incivility initiates a process of depletion of employee resources, making them unavailable to be invested for accomplishing work goals. This result is even more relevant in consideration of the fact that the present study has demonstrated that inefficiency of the organisational processes, in turn, creates optimal conditions for future incivility. Seen from this perspective, the mechanism highlighted by the present study seems to have the shape of a pernicious vicious cycle that, over time, may become even more difficult to break.

Overall, these findings support the principle of the loss spiral of COR theory (Hobfoll, 1989) and confirm that in OHP, referring to a rigid classification of variables as antecedents or outcomes may be limiting. Studying work-related psychosocial phenomena focusing on testing bidirectional influences over time may help better capture their complexity. Moreover, future research in this direction may also lead to the identification of general principles useful in integrating existing theoretical models (e.g. COR theory, Hobfoll, 1989), thus allowing OHP researchers to make more accurate predictions about the unidirectional or bidirectional nature of a specific relationship.

Finally, in the present study, the relationships tested controlled for bullying coming from three different sources and measured at two time points. Even though bullying was shown to have a significant effect on major study variables, the findings did not change substantially before and after controlling for it. In addition, to further strengthen our results, this evidence also helps unmask a stereotype – which is that incivility, being a mild form of mistreatment, is not harmful on its own but mostly because it may encourage the development of a more serious form of violence (Pearson & Porath, 2005) that may in turn negatively affect work well-being and organisational efficiency. Conversely, this study highlighted how incivility represents a serious risk on its own, being that its direct negative consequences are observable in the long term and after controlling for the impact of bullying.

Limitations

The present study has some limitations. One concern is that all the measures employed were self-reported. Data coming from a single source may introduce the issue of common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Future studies may benefit from employing research designs that include a combination of objective and subjective measures or using data from multiple sources (i.e. co-workers and supervisors).

Another concern is that to test the model proposed here, the optimal design would have used three waves rather than two waves. However, as pointed out by Cole and Maxwell (2003), a two-wave design is substantially better than a cross-sectional design in which there is no possibility to control for baseline levels of the dependent variable.

A final concern regards the difference in the time frames employed to measure the major study variables: whereas for incivility respondents were asked to refer to the previous year to assess their incivility exposure, for efficiency and exhaustion, a time frame was not specified in the instructions for respondents. Ideally, all measures should have employed the same time frame to support causal inferences among the variables under study.

Conclusion

The present study suggests that investing in interventions aimed at preventing co-worker incivility may contribute to preserving workers' health and thus enhancing organisational efficiency. The study's main contribution is the demonstration of the reciprocal nature of the relationship between incivility and organisational inefficiency. This result has significant implications from a practical point of view: interventions aimed at enhancing one of these things would also be beneficial for the other.

Previous studies mostly focused on the association of incivility with the characteristics of targets or the social environment, leading to identify the "zero tolerance" perspective (Pearson & Porath, 2005) as one of the most effective ways to reduce incivility. Although our study does not deny the importance of investing in this direction, it suggests that interventions in the work environment should be considered to reduce incivility. Organisations with a high number of reports of co-worker incivility may benefit from interventions aimed at fostering the quality of the work process. Encouraging middle management in planning meetings specifically aimed at sharing objectives or developing systems for implementing participative decision-making may reinforce the quality of the

process and thus the quality of the relationships among co-workers. However, broader interventions – such as programmes directed at promoting a culture of civility and respect in the workplace – may help prevent incivility and, as a consequence, exhaustion and diminished organisational efficiency.

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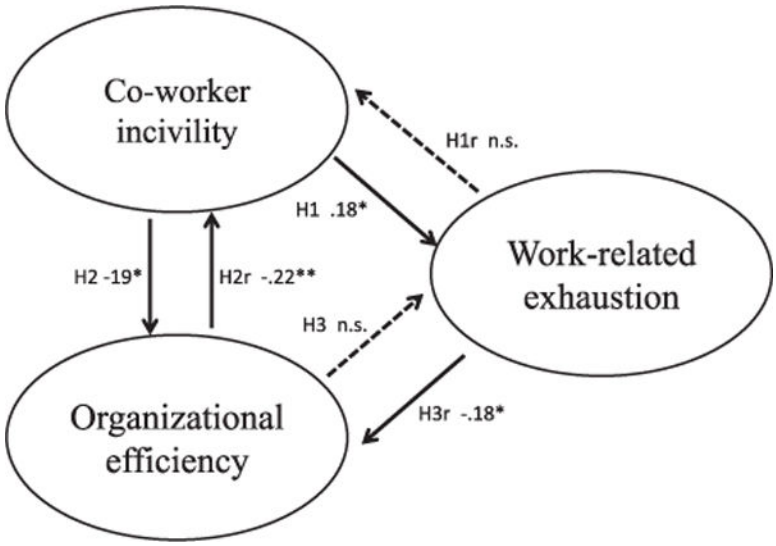

Figure 1.

The final model: the cross-lagged associations among co-worker incivility, exhaustion, and organisational efficiency adjusted for the effect of bullying from co-worker, superiors, and patients/visitors.

Note: *p ≤ .05; **p ≤ .01.

Table 1

Reliability and correlations of variables at the individual (n = 155) and unit (n = 28) levels.

	M (SD)	Test for differences between T1 and T2	α_{IL}	α_{UL}	Range	1	2	3	4	5	6
1. Co-worker incivility Time 1	1.91 (0.77)	−0.96^{ns}	.86	.87	1–5		.70**	.40**	.52**	−.31**	−.47**
2. Co-worker incivility Time 2	1.95 (0.76)		.87	.85	1–5	.75**		.38**	.54**	−.36**	−.60**
3. Exhaustion Time 1	3.52 (1.11)	1.68^{ns}	.90	.89	1–5	.28**	.31**		.79**	−.44**	−.58**
4. Exhaustion Time 2	3.41 (1.33)		.89	.90	1–5	.35**	.36**	.73**		−.28**	−.62**
5. Efficiency Time 1	2.82 (0.65)	0.99^{ns}	.80	.77	1–4	−.20**	−.21**	−.30**	−.22**		.51**
6. Efficiency Time 2	2.77 (0.62)		.82	.79	1–4	−.23**	−.33**	−.27**	−.29**	.52**	

Note: Unit-level correlations were reported above the diagonal; individual-level correlations were reported below the diagonal. IL = individual level; UL = unit level; ns = not significant.

$^{*}p \leq .05$ (two-tailed);

$^{**}p \leq .01$ (two-tailed).

Table 2

MCFA – test of alternative models – goodness-of-fit indexes.

						SRMR				
	$\chi^2(df)$	χ^2/df	CFI	TLI	RMSEA	Within	Between	Model comparisons	AIC	BIC
Time 1										
One-factor model (M1a)	517.93 (70)	7.39	0.47	0.32	.20	.22	.37	–	3826.51	3978.03
Two-factor model (M2a)	374.53 (68)	5.50	0.63	0.52	.17	.18	.21	M2a–M1a	3687.11	3844.69
Three-factor model (M3a)	70.63 (64)	1.10	0.99	0.98	.03	.06	.16	M3a–M2a	3391.21	3560.91
Time 2										
One-factor model (M1b)	371.02 (70)	5.30	0.61	0.50	.16	.22	.38	–	3679.08	3830.60
Two-factor model (M2b)	242.45 (68)	3.50	0.77	0.70	.12	.13	.19	M2b–M1b	3482.98	3640.56
Three-factor model (M3b)	33.18 (64)	0.55	1.00	1.00	.00	.03	.12	M3b–M2b	3353.24	3522.94

Note: *df* = degree of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Squared Residual; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.

Table 3

Cross-lagged associations (multilevel SEM) – test of alternative models – goodness-of-fit indexes.

						SRMR					
	χ^2 (*df*)	χ^2/df	CFI	TLI	RMSEA	Within	Between	Model comparisons	$\Delta\chi^2$ (*p*)	AIC	BIC
M1 (stability model)	353.61 (322)	1.09	.98	.98	.03	.09	.38	–	–	–	–
M2 (causality model)	336.58 (316)	1.06	.99	.99	.01	.07	.42	M1–M2	17.03 (.009)	–	–
M3 (reversed causation model)	332.67 (316)	1.05	.99	.98	.02	.07	.35	M1–M3	20.94 (.002)	–	–
M4 (reciprocity model)	319.45 (310)	1.03	.99	.99	.01	.06	.23	M3–M4	13.22 (.040)	6900.12	6506.17
M4a (adjusted for control variables)	431.06 (403)	1.06	.98	.98	.02	.07	.26	M4–M4a	–	7473.61	6948.02

Note: *df* = degree of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Squared Residual; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.