



# The moderating effects of personality on the relationship between change in work stressors and change in counterproductive work behaviours

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We examined the relationship between change in work stressors and change in counterproductive work behaviours (CWBs) over 6 months using three waves of data. Increases in work stressors (i.e., interpersonal conflict and organizational constraints) were positively associated with both increases in CWBs (trend effects) and subsequent levels of CWBs (delayed-reaction effects). Personality characteristics (i.e., agreeableness and conscientiousness) were examined as moderators of the trend effects and delayed-reaction effects. As expected, the trend effect was stronger for low-agreeableness (or low-conscientiousness) workers than for high-agreeableness (or high-conscientiousness) workers. Contrary to expectations, however, the delayed-reaction effect was not consistently moderated by personality. We recommend that organizations recognize the potential for delayed consequences when estimating the effects of changes to the work environment. Organizations may also consider using individually tailored training methods (based on the worker's unique personality) to instruct workers about effective coping strategies.

## Practitioner points

- Unfortunately for organizations, the nature of the work stressor–CWB relationship is likely more complex than could be previously understood utilizing cross-sectional data. Organizations should be aware that CWBs could increase concurrently with an increase in work stressors (trend effect) and subsequently after an extended increase in work stressors has occurred (delayed-reaction effect).
- The potential presence of both immediate and delayed CWB responses to change in work stressors may indicate that the damage caused by work stressors is often underestimated. Organizations need to be more aware of the potential delayed costs of changes in work stressors for financial forecasting, programme development, and policy change.
- Organizations should be particularly concerned about an increase in work stressors immediately resulting in CWBs among low-conscientiousness or low-agreeableness workers. Efforts to educate workers about effective coping strategies could be tailored based on the employee's personality. Managers, however, should be aware that low-conscientiousness or low-agreeableness workers may be particularly vulnerable to delayed effects of increasing work stressors.

The last four decades have seen significant growth in the study of occupational stress (Beehr, 1995; Quick & Tetrick, 2010). Work stressors – demanding working conditions

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that require an adaptive response from individual workers – can undermine worker well-being (Beehr, 1995) and can result in organizationally unwanted behaviours, such as counterproductive work behaviours (CWBs; Bowling & Eschleman, 2010; Fox, Spector, & Miles, 2001). The effects of stressors have been hypothesized to produce these undesirable consequences because stressors deplete workers' resources, such as their physical energy or self-esteem (Hobfoll, 1989, 1998, 2002). Because the current study examines the potential effects of stressors on CWBs, we focus on the regulatory resources needed to inhibit the impulse to engage in CWBs (Wang, Liao, Yujie, & Shi, 2011).

Research on the relationship between stressors and CWBs has important implications. CWBs have been estimated to cost organizations several billion dollars annually (Bennett & Robinson, 2000), and work stressors have been identified as one of the strongest predictors of CWBs (Berry, Ones, & Sackett, 2007; Colquitt, Conlon, Wesson, Porter, & Ng, 2001; Hershcovis *et al.*, 2007). Hence, comprehensive efforts to combat CWBs should address the presence of an increase in work stressors. To date, however, studies of the stressor–CWB relationship have primarily employed *between-person designs*. This study builds on this research using a *within-person design* to examine: (1) the effects of temporal change in work stressors on CWBs and (2) employee personality as a moderator of the relationship between temporal change in work stressors and CWBs. As a basis for these latter analyses, we describe personality traits – specifically agreeableness and conscientiousness – as types of regulatory resources (see Hobfoll, 2002).

### ***The need for within-person studies of the work stressor–CWB relationship***

Although cross-sectional studies have consistently found a positive relationship between work stressors and CWBs (Berry *et al.*, 2007; Colquitt *et al.*, 2001; Hershcovis *et al.*, 2007) and have tested the moderating effects of personality (Bowling & Eschleman, 2010; Fox *et al.*, 2001; Penney & Spector, 2002, 2005), researchers have been unable to capture the implied dynamic nature of the work stressor–CWB relationship. An increase in work stressors is inherently different from a static level of work stressors because a volatile environment implies uncertainty in future working conditions and uncertainty itself depletes resources (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002). Using between-person designs, researchers have thus overlooked the dynamic effects of work stressors on CWBs. This study, however, incorporates a multiwave design to examine immediate (trend effect) and subsequent (delayed-reaction effect) CWB reactions to change in work stressors. In addition, we hypothesize that worker agreeableness and conscientiousness will moderate the presence of both a trend effect and a delayed-reaction effect.

### ***Change in work stressors and CWBs***

Counterproductive work behaviours can harm either the *organization* (CWB-Os) or *individuals* within the organization (CWB-Is). For example, behaviours include withdrawal (e.g., absence, turnover intention), deviance (e.g., theft, sabotage, withholding effort), and interpersonal aggression (Chen & Spector, 1992; Robinson & Bennett, 1995). The work stressors most consistently and strongly associated with CWBs among between-person studies include interpersonal conflict and organizational constraints (Hershcovis *et al.*, 2007). Interpersonal conflict represents the disagreements or arguments with others at work; organizational constraints may be described as the conditions, or 'red tape', that make it difficult or impossible for workers to do their job,

such as poor equipment or inadequate help (Spector & Jex, 1998). At the between-person level, work stressors and CWBs are positively correlated, as evident by several meta-analyses (Berry *et al.*, 2007; Cohen-Charash & Spector, 2001; Colquitt *et al.*, 2001; Hershcovis *et al.*, 2007). Despite the cross-sectional design, the theoretical mechanisms that explain the work stressor–CWB relationship imply effects for temporal changes in work stressors.

According to conservation of resources theory (COR), workers have an inherent need to acquire, maintain, and protect their resources (Hobfoll, 1989, 1998, 2002). Workers will experience distress when they are confronted with actual resource loss, with the threat of resource loss, or when the investment of existing resources fails to result in the acquisition of new resources. Resources are broadly categorized into contextual resources that are found in the social context of the individual (e.g., supervisor support, job autonomy) and personal resources that are more proximate to the self (e.g., personality traits, abilities, skills). A given resource can be further categorized as a volatile, structural, or key resource (Hobfoll, 2002; ten Brummelhuis & Bakker, 2012). Volatile resources are fleeting (e.g., physical energy, instrumental support) and can only be used once before needing to be replenished. Structural resources are durable (e.g., experience, social network) and can be used repeatedly. Key resources are regulation resources that facilitate acquisition, development, and activation of other resources; they influence how other resources are used, and often include personality traits that enable efficient coping styles.

Whereas the presence of work stressors can threaten a worker's current resources, change in work stressors involves an added threat to a worker's future resources. Specifically, a volatile environment is inherently threatening because of the uncertainty regarding future working conditions (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002). Similarly, worsening conditions are believed to lead people to think they are less capable than others who experience improving conditions (Hsee & Abelson, 1991). As result, workers who experience an increase in work stressors are likely susceptible to strain. CWBs are often described as a behavioural strain response (Bowling & Eschleman, 2010; Fox *et al.*, 2001; Penney & Spector, 2005) because CWBs are an indicator that workers have depleted resources to the extent that they choose to engage in ineffective coping strategies to prevent from further resource loss (Bowling & Eschleman, 2010). In addition, resource loss may result in the inability to control one's their behaviours (Wang *et al.*, 2011). In other words, CWBs are an indicator that a worker no longer has the resources necessary to inhibit impulses. Both behavioural reactions indicate a loss of resources.

### *Trend effect*

To examine the dynamic relationship between change in work stressors and change in CWBs, we focus on two types of within-person effects: Trend effect and delayed-reaction effect (Frese & Zapf, 1988; Garst, Frese, & Molenaar, 2000). A trend effect is represented by an immediate or concurrent reaction to a change in work stressors. That is, within-person change in a work stressor is associated with within-person change in a strain over an extended period of time (several months or years; Garst *et al.*, 2000). The immediate reaction to a change in work stressors may occur because CWBs are in part affectively driven and spontaneous (Spector & Fox, 2005). An increase in organizational constraints, for example, may require a worker to use additional energy and personal time to complete required tasks. The loss of resources may result in the worker yelling at a

customer during a hectic workday. A trend effect between stressors and strains has been found in the few studies that have tested it (Garst *et al.*, 2000; Vandenberghe, Panaccio, Bentein, Mignonac, & Roussel, 2011). To date, however, no study has examined a trend effect between work stressors and CWBs. Based on the above theorizing, we predict that within-person increases in work stressors will be positively related to within-person increases in CWBs.

*Hypothesis 1:* Change in work stressors will be positively related to change in CWBs (trend effect). Specifically, a greater increase in work stressors across Waves 1, 2, and 3 will be positively associated with a greater increase in CWBs across Waves 1, 2, and 3.

#### *Delayed-reaction effect*

The within-person stressor–strain relationship may also be described by a delayed-reaction effect after the initial exposure to a change in stressors (Garst *et al.*, 2000). It is important to note that the trend effect and delayed-reaction effect are not mutually exclusive phenomena. Rather, both effects may result from resource loss or in an effort to protect from resource loss. A delayed-reaction effect – as opposed to a trend effect – may occur to the extent that CWBs result from a calculated cognitively driven process and hence take time to occur. For instance, a worker may attempt to protect from further resource loss by choosing to engage in CWBs. In an effort to keep their behaviours hidden from supervisors and co-workers, a worker is likely to wait for an opportune time to engage in CWBs (Spector & Fox, 2005). Similarly, a worker may choose to engage in intermediate – and perhaps more productive – coping strategies as part of a reaction to change in stressors, which enable a worker to be temporarily successful in avoiding strain. If the initially productive coping strategies become too taxing to maintain, a worker may choose CWBs as a form of coping. In addition to the cognitively driven process, a delayed-reaction event may also occur because the worker is no longer capable of inhibiting the impulse to engage in CWBs (Wang *et al.*, 2011). As previously noted, initially productive coping strategies may require additional resources that eventually become taxing on the worker. The additional resource loss from initial coping strategy may result in the worker being incapable of refraining from CWBs. Overall, each of these possibilities describe a delayed-reaction of CWBs.

It is also possible that both a delayed-reaction effect and trend effect occur for a worker experiencing an increase in work stressors. For example, a worker who reacts to an increase in organizational constraints by yelling at a customer during a hectic workday may have created a worsening situation and added to their list of stressors. As a result, the worker may become increasingly susceptible to strain at a later date. In other words, there is a bidirectional relationship between work stressors and CWBs (Meier & Spector, 2013).

To test the delayed-reaction effect, researchers have previously examined the relationship between static levels of work stressors and the change in strains. This analytical method has resulted in mixed findings (see Garst *et al.*, 2000; Meier & Spector, 2013). Although these models provide insight into the dynamic relationship between stressors and strains, they do not capture the inherent demands of uncertainty from a change in work stressors. In this study, we test the relationship between change in work stressors and subsequent levels of CWBs to examine a delayed-reaction effect. Specifically, we hypothesize that an increase in work stressor over 6 months (Wave 1 through Wave 3) will be positively associated with subsequent level of CWBs at the end of the 6 months (Wave 3).

*Hypothesis 2:* Change in work stressors will be positively related to subsequent levels of CWBs (delayed-reaction effect). Specifically, a greater increase in work stressors across Waves 1, 2, and 3 will be associated with a greater level of CWBs at Wave 3.

### **Moderating effects of personality**

Both the trend effect and delayed-reaction effect are rooted in the notion that an increase in work stressors will deplete a worker's resources to a degree that the worker will choose to engage in CWBs in an effort to prevent further resource loss (Bowling & Eschleman, 2010) or because the worker can no longer effectively regulate behaviours (Wang *et al.*, 2011). However, some people have inherently more resources than do others. Key resources – the resources that manage the acquisition, development, and activation of other resources – are vital to successfully maintaining one's resources when faced with an increase in work stressors. Agreeableness and conscientiousness are personality traits that can be described as key resources that enable workers to successfully manage an increase in work stressors and inhibit CWBs.

Agreeableness, which is included within the Five-Factor Model of Personality (Costa & McCrae, 1992; Goldberg, 1990), reflects the degree to which a person is cooperative, unaggressive, good-natured, altruistic, has a propensity to trust, and is sensitive to the needs of others. Agreeableness may be a key resource that facilitates effective protection of resources because a high-agreeableness worker is more effective in establishing close relationships with co-workers and successfully managing their social network to avoid misuse of their interpersonal resources. In addition, high-agreeableness workers may not perceive the increase in work stressors as an indicator of future poor working conditions because of their propensity to trust their employers. A high-agreeableness worker may thus believe (perhaps incorrectly) that the organization has their best interests at heart and would not allow the increase in stressors to continue into the future. In sum, high-agreeableness workers are likely to successfully acquire and manage the interpersonal resources needed to cope with an increase in work stressors and inhibit CWBs.

Given that agreeableness is conceptually linked to the acquisition and management of interpersonal resources and cooperation with others, agreeableness is likely to influence a workers ability to inhibit CWBs directed interpersonally (CWB-Is) in both short term (trend effect) and long term (delayed-reaction effect). Despite the conceptual link between agreeableness and key resources, limited support has been found among between-person studies for the moderating effects of agreeableness on the work stressor–CWB relationship (Bowling & Eschleman, 2010). Using cross-sectional data, Bowling and Eschleman found the positive relationship between work stressors and CWBs was stronger for low-agreeableness workers in only one of six interactions tested. However, not observing an effect at one level of analysis does not rule out observing a parallel effect at a different level of analysis. In regard to the trend effect, we hypothesize that the positive relationship between change in work stressors and change in CWB-Is will be weaker for high-agreeableness workers than for low-agreeableness workers. In regard to the delayed-reaction effect, we hypothesize that the positive relationship between change in work stressors and subsequent levels of CWB-Is will be weaker for high-agreeableness workers than for low-agreeableness workers.

*Hypothesis 3a:* Agreeableness will moderate the relationship between change in work stressors and change in CWB-Is (trend effect). Specifically, the positive

relationship between change in work stressors and change in CWB-Is will be stronger for low-agreeableness workers than for high-agreeableness workers.

*Hypothesis 3b:* Agreeableness will moderate the relationship between change in work stressors and subsequent levels of CWB-Is (delayed-reaction effect). Specifically, the positive relationship between change in work stressors and subsequent levels in CWB-Is will be weaker for high-agreeableness workers than for low-agreeableness workers.

Conscientiousness, which is also included within the Five-Factor Model of Personality (Costa & McCrae, 1992; Goldberg, 1990), reflects the degree to which a person is ambitious, responsible, abides by ethical principles, and considers the consequences of behaviours before acting. Conscientiousness is a key resource that may facilitate effective protection of resources because a high-conscientiousness worker can call upon the task-oriented resources acquired from being achievement oriented, such as organizational support (Wayne, Shore, & Liden, 1997). The characteristic of adherence to ethical principles also makes high-conscientiousness workers more likely to manage resources so that they can successfully regulate their behaviours to be consistent with organizational norms and policies. That is, the worker may even respond constructively to an increase in work stressors by informing management of more effective paths to successfully complete the task. In addition, high-conscientiousness workers may not perceive the increase in work stressors as a threat to future resources. High-conscientiousness workers may believe (perhaps incorrectly) that their ambition and achievement orientation will enable them to overcome any future work stressors. In sum, high-conscientiousness workers are likely to successfully acquire and manage task-oriented resources needed to cope with an increase in work stressors and inhibit CWBs.

Given that conscientiousness is conceptually linked to managing task-oriented resources and adherence to ethical principles, conscientiousness is likely to influence a workers ability to inhibit CWBs directed towards the organization (CWB-Os) in both short term (trend effect) and long term (delayed-reaction effect). A few studies have examined the moderating effects of conscientiousness on the work stressor–CWB relationship using cross-sectional data. Consistent with COR, the relationships between work stressors and CWBs were stronger for low-conscientiousness workers in all six interactions tested (Bowling & Eschleman, 2010). It is important to note, however, that high-conscientiousness workers may actually engage in greater amounts of CWBs under some circumstances. Penney, Hunter, and Perry (2011) found that high-conscientiousness workers may engage in CWBs when other coping options are unavailable and resources are depleted. As a result, it is necessary to further examine the moderating effects of conscientiousness on the work stressor–CWB relationship. In regard to the trend effect, we hypothesize that the positive relationship between change in work stressors and change in CWB-Os will be stronger for low-conscientiousness workers than for high-conscientiousness workers. In regard to the delayed-reaction effect, we hypothesize that the positive relationship between change in work stressors and subsequent levels of CWB-Os will be stronger for low-conscientiousness workers than for high-conscientiousness workers.

*Hypothesis 4a:* Conscientiousness will moderate the relationship between change in work stressors and change in CWB-Os (trend effect). Specifically, the positive relationship between change in work stressors and change in

CWB-Os will be stronger for low-conscientiousness workers than for high-conscientiousness workers.

- Hypothesis 4b:* Conscientiousness will moderate the relationship between change in work stressors and subsequent levels of CWB-Os (delayed-reaction effect). Specifically, the positive relationship between change in work stressors and subsequent levels in CWB-Os will be stronger for longer-conscientiousness workers than for high-conscientiousness workers.

## Method

### **Study design and participants**

Full-time workers participated in a three waves of data collection over 6 months (initial time point, 3-month time lag, 6-month time lag). Whereas several diary studies have examined the *short-term* (daily) within-person changes in stressors and strains (Ilies, Dimotakis, & De Pater, 2010; Ilies, Johnson, Judge, & Keeney, 2011; Totterdell, Wood, & Wall, 2006), the current study uses a 6-month study duration to assess the *long-term* within-person changes. In general, time lags of several months or more are useful for assessing change in many job stressor and job strain variables (Taris & Kompier, 2014). In addition, the magnitude of lagged effects is highly variable, but tends to increase for up to a 3-year period (Ford *et al.*, 2014). Thus, the 6-month study duration is likely an adequate study design because it enables enough time for change to occur in the study variables, but at the same time, not so long as to have a delayed-reaction effect disappear or to result in excessively high levels of participant attrition. The 3-month time lag between data collections also provides adequate time for workers to identify an opportunity to engage in CWBs. CWBs are often conducted outside of the awareness of others and occur infrequently (Spector & Fox, 2005). Asking participants whether they have engaged in CWBs over an extended period of time (e.g., past 30 days) reduces the likelihood of range restriction.

Access to participants was provided by the StudyResponse Project ('The StudyResponse Project', n.d.), which has been used to recruit participants in several published studies (Harris, Anseel, & Lievens, 2008; Judge, Ilies, & Scott, 2006; Piccolo & Colquitt, 2006). For a fee, StudyResponse emailed an on-line questionnaire to 4,000 people in their database. To encourage participation, people who complete the questionnaire were entered into a raffle for a chance to win one of six \$50 gift cards. Separate raffles were conducted after each wave of data collection.

Of the 726 participants who completed the Wave 1 survey, a total of 215 participants provided complete data across all three waves of data collection. The 18% initial response rate is similar to other data collection efforts using StudyResponse Project ('The StudyResponse Project', n.d.). In addition, we examined non-random sampling effects of attrition (Goodman & Blum, 1996) because the sample had an attrition rate >70%. We compared the Wave 1 descriptive statistics for the study sample ( $n = 215$ ) and attrition sample ( $n = 511$ ). Attrition unlikely yielded response biases because there were no significant differences between the two groups. Among those who completed all three waves, the average participant was 38 years old. Approximately 55% of participants were female, 69% were Caucasian, and 80% of participants had attended college. Several different industries were represented among

participants, including administration support, education/training, health/safety, retail/wholesale, and technology.

## **Measures**

### *Work stressors*

Interpersonal conflict and organizational constraints were assessed during all three waves of data collection. Interpersonal conflict was computed by averaging four items from Spector and Jex (1998). Each item was on a 5-point scale from less than once per month or never (1) to several times per day (5). A sample interpersonal conflict item is 'how often do you get into arguments with others at work'. The alpha reliabilities for interpersonal conflict for Waves 1, 2, and 3 were .87, .83, and .92, respectively. Organizational constraints were computed by averaging 11 items from Spector and Jex (1998). Participants were instructed to rate how often they found it difficult or impossible to do their job because different workplace events, such as 'your supervisor', 'lack of equipment or supplies', and 'incorrect instructions'. Each item was on a 5-point scale from less than once per month or never (1) to several times per day (5). The alpha reliabilities for organizational constraints for Waves 1, 2, and 3 were .94, .92, and .94, respectively.

### *CWBs*

We used Bennett and Robinson's (2000) scale to assess CWBs during all three waves of data collection. This measure, which includes a subscale assessing CWBs directed at individuals (CWB-Is; average of seven items) and a subscale assessing CWBs directed at the organization (CWB-Os; average of 12 items), asks participants how often they engage in CWBs over the past 30 days. Each item was on a 7-point scale from never (1) to daily (7). A sample CWB-O item is 'Put little effort into your work', and a sample CWB-I item is 'Made fun of someone at work'. The alpha reliabilities for CWB-I for Waves 1, 2, and 3 were, .88, .93, and .94, respectively; the alpha reliabilities for CWB-O for Waves 1, 2, and 3 were, .90, .93, and .94, respectively.

### *Personality*

Personality was assessed during Wave 1 data collection. Agreeableness and conscientiousness were each assessed with the average of 10 items from the Big Five Factor Markers of the International Personality Item Pool (Goldberg *et al.*, 2006; International Personality Item Pool, n.d.). Each item was on a 7-point scale from strongly disagree (1) to strongly agree (7). A sample agreeableness item is 'I sympathize with others' feelings' and a sample conscientiousness item is 'I am exacting in my work'. The agreeableness scale yielded an alpha reliability of .81, and the conscientiousness scale yielded an alpha reliability of .78.

## **Data analysis**

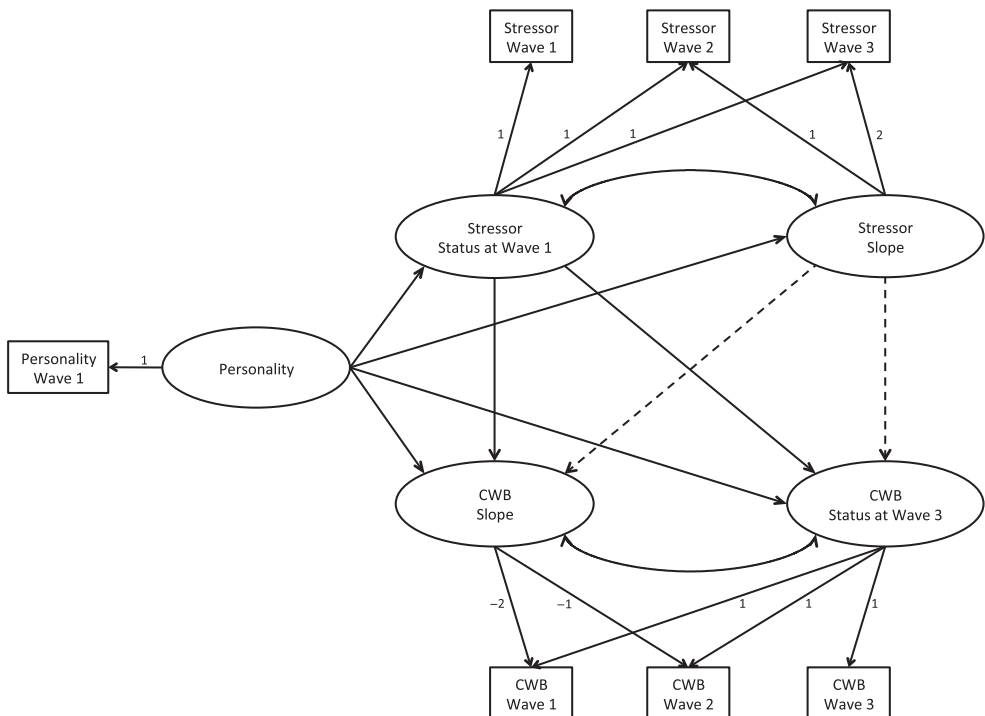
We used latent growth modelling (LGM; Duncan, Duncan, & Strycker, 2006) to test our hypotheses because LGM enables researchers to simultaneously estimate and model change within multiple variables. We used MPLUS 5.1 (Muthen & Muthén, 2008) to examine a series of models that test hypotheses 1 and 2. Specifically, following the steps outlined by Duncan *et al.* (2006), we first examined the growth trajectory for



each of the variables separately. A series of nested univariate LGM models were fitted to the data for each variable to establish the final model that best depicted the change trajectory. Linear change models were used for all variables. The slope parameter in the univariate model is normally tested for significance to determine whether a bivariate model is appropriate. Because only three time points were included in the analyses, the chi-squared difference test of significance may not have sufficient power to detect variability in change (LaHuis & Ferguson, 2009). As a result, all of the variables were included in the bivariate models regardless of significant slope variance in univariate model.

The growth models for work stressors included two latent factors: Wave 1 status and change (the slope of a line using Waves 1, 2, and 3 as data points for the line). The work stressor models included fixed factor loading of 0 (Wave 1), 1 (Wave 2), and 2 (Wave 3) for the slope factor. Because we were interested in examining levels of CWBs at the end of the study, the models for CWBs were built to include status at Wave 3 rather than Wave 1. Specifically, the slope factor for CWBs preceded the status factor (see Duncan *et al.*, 2006; Juang & Cookston, 2009) so that the two latent factors were slope and Wave 3 status. The CWB models included fixed factor loading of  $-2$  (Wave 1),  $-1$  (Wave 2), and 0 (Wave 3) for the change factor.

After building the univariate models, we specified a bivariate LGM model to estimate the structural relationships among work stressors (Wave 1 status and change) and CWBs (change and Wave 3 status). As presented in Figure 1, the bivariate models included



**Figure 1.** An example of an latent growth modelling model for work stressors, counterproductive work behaviours (CWBs), and personality. The paths tested for moderation effects of personality are indicated with dashed line.

structural paths from both work stressor factors (Wave 1 status and change) to both CWBs factors (change and Wave 3 status). The bivariate models also included a personality latent variable. Structural paths were identified between the personality variable and each latent variable. Agreeableness was added to models that included CWB-Is, whereas conscientiousness was added to models that included CWB-Os. These models were used to test hypotheses 1 and 2.

We specified latent variable interactions using MPLUS software (Muthén & Muthén, 2008), in which the model is estimated using maximum likelihood. To test hypotheses 3 and 4, which examine the interaction effects of personality, we mean-centred all work stressor (Wave 1, 2, and 3) and personality variables (Wave 1). A latent interaction variable (change in work stressor  $\times$  personality) was created with a structural path from the interaction variable to change either in CWBs or in subsequent levels of CWBs at Wave 3. To interpret the direction of significant interactions, we used the path coefficients from the final model that included the mean-centred variables. Specifically, using the growth model with personality and interaction variables included, we compared the structural path from interaction variable (either positive or negative) with the path of the work stressor–CWB relationship being moderated (either positive or negative). In addition, we plotted significant interactions using  $\pm 1$  standard deviation for both the work stressor and personality variables (Aiken & West, 1991).

## Results

The descriptive statistics and correlations for the study variables are presented in Table 1. All variables had acceptable reliabilities, ranging from .78 to .94.

### *Change in work stressors and CWBs*

We relied on the comparative fit index (CFI; Bentler, 1990) and standardized root mean square residual (SRMR; Bentler, 1995) to determine goodness of fit of the bivariate growth models. There were four models in total. The best-fitted models were organizational constraints – CWB-Os,  $X^2(10, n = 215) = 37.57, p < .01, CFI = .97, SRMR = .05$ , and organizational constraints – CWB-Is,  $X^2(10, n = 215) = 46.10, p < .01, CFI = .96, SRMR = .05$ . The other reasonably fitted models were interpersonal conflict – CWB-Os,  $X^2(10, n = 215) = 91.27, p < .01, CFI = .91, SRMR = .08$ , and interpersonal conflict – CWB-Is,  $X^2(10, n = 215) = 96.56, p < .01, CFI = .92, SRMR = .07$ . Slope means ( $\mu$ ) and latent variable relationships for the bivariate growth models are presented in Table 2.

We found support for Hypothesis 1, which predicted a relationship between change in work stressors and change in CWBs. Change in interpersonal conflict ( $\gamma = 0.09; p < .01$ ) and change in organizational constraints ( $\gamma = 0.04; p < .01$ ) were associated with change in CWB-Is. Similarly, change in interpersonal conflict ( $\gamma = 0.06; p < .01$ ) and change in organizational constraints ( $\gamma = 0.04; p < .01$ ) were associated with change in CWB-Os. All relationships were in the expected direction, suggesting that greater increases in work stressors were associated with greater increases in CWBs.

We also found support for Hypothesis 2, which predicted a positive relationship between increase in work stressors and subsequent levels of CWBs at Wave 3. Change in interpersonal conflict ( $\gamma = 0.12; p < .01$ ) and organizational constraints ( $\gamma = 0.05; p < .05$ ) were associated with subsequent levels of CWB-Is. Similarly, change in

**Table 1.** Descriptive statistics, reliabilities, and correlations for study variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<b>Work stressors</b>																
1 Interpersonal Conflict Wave 1	1.46	0.76	(.87)													
2 Interpersonal Conflict Wave 2	1.38	0.65	.71	(.83)												
3 Interpersonal Conflict Wave 3	1.49	0.86	.67	.70	(.92)											
4 Organizational Constraints Wave 1	1.84	0.87	.73	.58	.58	(.94)										
5 Organizational Constraints Wave 2	1.81	0.80	.38	.48	.36	.67	(.92)									
6 Organizational Constraints Wave 3	1.86	0.85	.44	.44	.66	.68	.68	(.94)								
<b>Counterproductive work behaviours</b>																
7 CWB-I Wave 1	1.72	1.06	.68	.53	.43	.52	.34	.35	(.88)							
8 CWB-I Wave 2	1.80	1.23	.62	.67	.51	.51	.48	.42	.82	(.93)						
9 CWB-I Wave 3	1.80	1.26	.62	.55	.66	.51	.36	.53	.73	.74	(.94)					
10 CWB-O Wave 1	1.77	0.96	.50	.44	.30	.46	.32	.32	.69	.65	.56	(.90)				
11 CWB-O Wave 2	1.84	1.10	.52	.58	.44	.46	.42	.42	.61	.79	.59	.76	(.93)			
12 CWB-O Wave 3	1.90	1.17	.53	.41	.53	.47	.30	.50	.58	.61	.82	.68	.71	(.94)		
<b>Personality</b>																
13 Agreeableness	5.48	0.95	-.31	-.32	-.27	-.27	-.13	-.20	-.38	-.35	-.32	-.33	-.38	-.30	(.81)	
14 Conscientiousness	5.05	0.96	-.31	-.26	-.14	-.24	-.05	-.10	-.36	-.31	-.28	-.48	-.39	-.33	.35	(.78)

Notes.  $n = 215$ . CWBs, counterproductive work behaviours; CWB-I, CWBs directed interpersonally; CWB-O, CWBs directed organizationally. Uncorrected correlations presented below the diagonal. Alpha reliabilities are presented on the diagonal in parentheses. Correlations  $\geq \pm .14$  are significant at  $p < .05$ . Correlations  $\geq \pm .16$  are significant at  $p < .01$ .

**Table 2.** Growth model estimates of the relationships between work stressors, CWBs, and personality

Model	Work stressor	CWB	Trait	Mean (SD)		Latent factor relationships					
				CH <sub>Stressor</sub>	CH <sub>CWB</sub>	CH <sub>Stressor</sub> CH <sub>CWB</sub>	CH <sub>Stressor</sub> W3 <sub>CWB</sub>	WI <sub>Stressor</sub> CH <sub>CWB</sub>	WI <sub>Stressor</sub> W3 <sub>CWB</sub>	Trait CH <sub>CWB</sub>	Trait W3 <sub>CWB</sub>
Interpersonal Conflict	CWB-I	Agreeableness	0.01 (0.27)	0.05 (0.32)	0.09**	0.12**	0.00	1.21**	-0.02	-0.14	
Organizational Constraints	CWB-I	Agreeableness	0.01 (0.21)	0.05 (0.30)	0.04**	0.05*	0.04	0.87**	-0.02	-0.24**	
Interpersonal Conflict	CWB-O	Conscientiousness	0.02 (0.28)	0.07 (0.27)	0.06**	0.08**	0.04	1.01**	0.04	-0.16*	
Organizational Constraints	CWB-O	Conscientiousness	0.01 (0.22)	0.07 (0.29)	0.04**	0.06**	0.04	0.71**	0.04	-0.27**	

Notes. *n* = 215. W1, status at Wave 1; W3, status at Wave 3; CH, change over time; CWBs, counterproductive work behaviours; CWB-I, CWBs directed interpersonally; CWB-O, CWBs directed organizationally. Unstandardized estimates provided.

\**p* < .05; \*\**p* < .01.

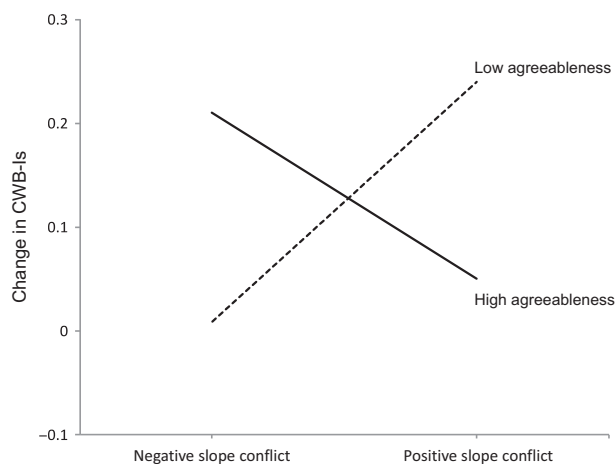
interpersonal conflict ( $\gamma = 0.08$ ;  $p < .01$ ) and organizational constraints ( $\gamma = 0.06$ ;  $p < .01$ ) were associated with subsequent levels of CWB-Os, suggesting greater increases in work stressors were associated with greater subsequent levels of CWBs at Wave 3.

### **Moderating effects of personality**

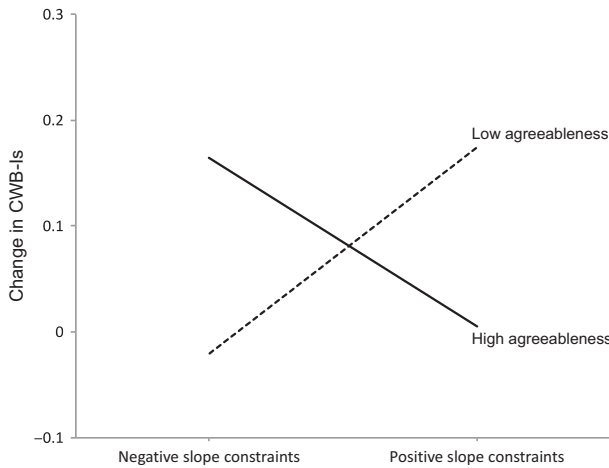
We found support for Hypothesis 3a, which predicted the positive relationship between change in work stressors and change in CWB-Is would be stronger for low-agreeableness workers than for high-agreeableness workers (moderation of the trend effect). As predicted, agreeableness moderated the relationships between change in interpersonal conflict and change in CWB-Is ( $\gamma = -0.49$ ;  $p < .01$ ) and change in organizational constraints and change in CWB-Is ( $\gamma = -0.58$ ;  $p < .01$ ). Specifically, a greater increase in interpersonal conflict (Figure 2) and organizational constraints (Figure 3) was associated with a greater increase in CWB-Is for low-agreeableness workers. The trend effect, in other words, was more strongly supported for low-agreeableness workers than for high-agreeableness workers.

We found no support for Hypothesis 3b, which predicted that the positive relationship between change in work stressors and subsequent levels in CWB-Is would be stronger for low-agreeableness workers than for high-agreeableness workers (i.e., moderation of the delayed-reaction effect). Specifically, agreeableness did not moderate the relationship between change in interpersonal conflict and subsequent CWB-Is ( $\gamma = 0.51$ ;  $p > .05$ ). Although agreeableness moderated the relationship between change in organizational constraints and subsequent CWB-Is ( $\gamma = 1.26$ ;  $p < .01$ ), the interaction was not in the expected direction. As shown in Figure 4, there was a stronger positive relationship between change in organizational constraints and subsequent CWB-Is for high-agreeableness workers than low-agreeableness workers. In sum, we found support for Hypothesis 3a, but not for Hypothesis 3b.

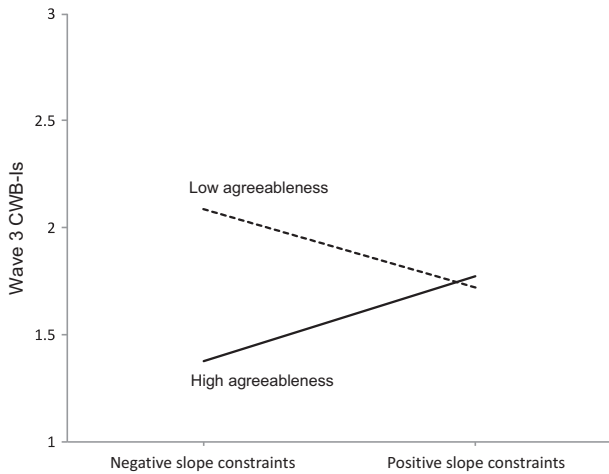
We found support for Hypothesis 4a, which predicted the positive relationship between increase in work stressors and increases in CWB-Os would be stronger for



**Figure 2.** Moderating effects of agreeableness on the relationship between change in interpersonal conflict and change in counterproductive work behaviours directed interpersonally (CWB-Is, trend model).

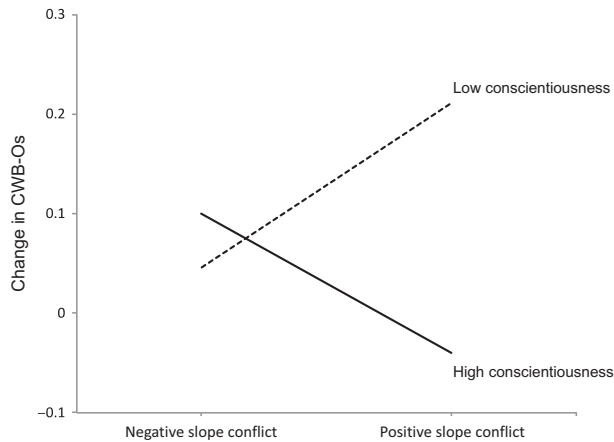


**Figure 3.** Moderating effects of agreeableness on the relationship between change in organizational constraints and change in counterproductive work behaviours directed interpersonally (CWB-Is, trend model).

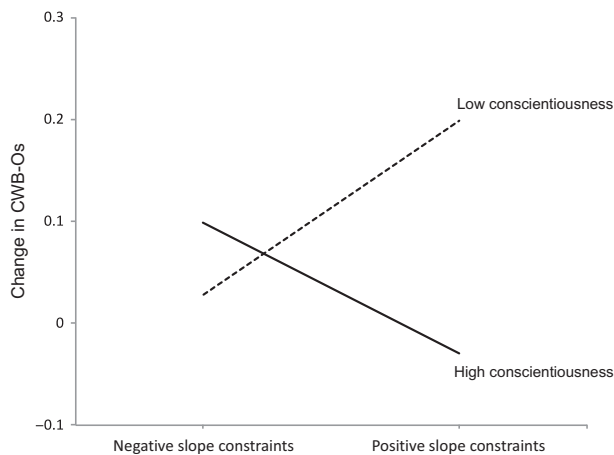


**Figure 4.** Moderating effects of agreeableness on the relationship between change in organizational constraints and subsequent counterproductive work behaviours directed interpersonally (CWB-Is, delayed-reaction model).

low-conscientiousness workers than for high-conscientiousness workers (i.e., moderation of the trend effect). Specifically, conscientiousness moderated the relationship between change in interpersonal conflict and change in CWB-Os ( $\gamma = -0.44$ ;  $p < .01$ ) and the relationship between change in organizational constraints and change in CWB-Os ( $\gamma = -0.57$ ;  $p < .01$ ). As shown in Figures 5 and 6, increases in interpersonal conflict and organizational constraints were more strongly associated with increases in CWB-Os when workers were low in conscientiousness. The trend effect, in other words, was more strongly supported among low-conscientiousness workers compared to high-conscientiousness workers.



**Figure 5.** Moderating effects of conscientiousness on the relationship between change in interpersonal conflict and change in counterproductive work behaviours directed organizationally (CWB-Os, trend model).



**Figure 6.** Moderating effects of conscientiousness on the relationship between change in organizational constraints and change in counterproductive work behaviours directed organizationally (CWB-Os, trend model).

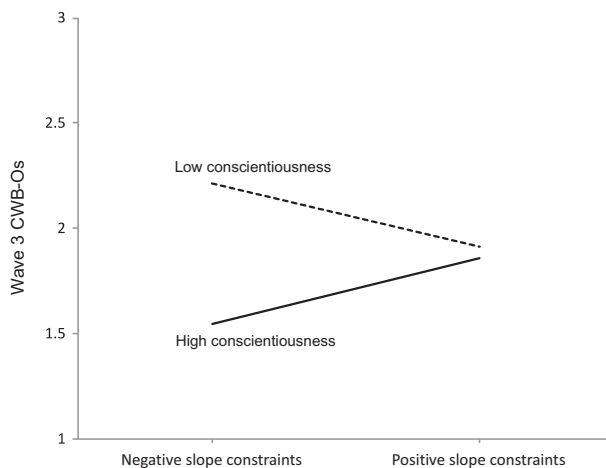
We found no support for Hypothesis 4b, which predicted that the positive relationship between change in work stressors and subsequent levels in CWB-Os would be stronger for low-conscientiousness workers than for high-conscientiousness workers (i.e., moderation of the delayed-reaction effect). Conscientiousness did not moderate the relationship between change in interpersonal conflict and subsequent CWB-Os ( $\gamma = 0.86$ ;  $p > .05$ ). Although conscientiousness did moderate the relationships between change in organizational constraints and subsequent CWB-Os ( $\gamma = 1.23$ ;  $p < .01$ ), the interaction was not in the expected direction (see Figure 7). Specifically, we observed a stronger positive relationship between change in organizational constraints and subsequent CWB-Os for high-conscientiousness workers than low-conscientiousness workers. In sum, we found support for Hypothesis 4a, but not for Hypothesis 4b.

## Discussion

### Change in work stressors and CWBs

Several cross-sectional studies have examined the relationship between work stressors and CWBs (Berry *et al.*, 2007; Cohen-Charash & Spector, 2001; Colquitt *et al.*, 2001; Hershcovis *et al.*, 2007), which have consistently found *between-person* effects in which workers exposed to high levels of work stressors generally engage in more CWB than do workers exposed to low levels of work stressors. The current study builds on existing research by examining the work stressor–CWB relationship from a *within-person* perspective. As summarized below, we found evidence for two types of within-person effects: Trend effects and delayed-reaction effects.

A trend effect occurs when within-person increases (decreases) in work stressors are associated with within-person increases (decreases) in strains (Garst *et al.*, 2000). In support of Hypothesis 1, increases in work stressors (i.e., organizational constraints, interpersonal conflict) were positively associated with increases in CWBs. For all four combinations of work stressors and CWBs, workers who increased in work stressors over 6 months also increased in CWBs over the same period. The trend effect is consistent with COR, which indicates that workers seek to acquire, maintain, and protect their personal resources to avoid strain (Hobfoll, 1989, 1998, 2002). In addition to work stressors threatening resources, an unpredictable environment creates uncertainty and uncertainty itself depletes resources (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002). As a result, the threat to resources from an increasingly demanding and unpredictable environment can limit a worker's ability to regulate their behaviours and result in the adoption of maladaptive loss control strategies (e.g., CWBs; Wang *et al.*, 2011). These results provide evidence for a trend effect between work stressors and CWBs and are consistent with the few studies examining the trend effects of the stressor–strain relationship (Garst *et al.*, 2000; Vandenberghe *et al.*, 2011). Support for the trend effect does not refute the notion of a bidirectional relationship, but rather is evidence of an immediate and continuous relationship between work stressors and CWBs.



**Figure 7.** Moderating effects of conscientiousness on the relationship between change in organizational constraints and subsequent counterproductive work behaviours directed organizationally (CWB-Os, delayed-reaction model).



A delayed-reaction effect occurs when workers display a strain reaction that appears some time after the stressor is first introduced (Garst *et al.*, 2000). In support of Hypothesis 2, changes in work stressors (i.e., organizational constraints, interpersonal conflict) were positively associated with subsequent CWB levels at Wave 3. For all four combinations of work stressors and CWBs, workers who increased in work stressors over 6 months reported greater subsequent levels of CWBs at Wave 3. In other words, workers were more likely to engage in CWBs after an extended increase in work stressors. The delayed-reaction effect is also consistent with COR and need to acquire and maintain resources to avoid strain (Hobfoll, 2002). In addition to work stressors threatening resources, an unpredictable environment creates uncertainty that depletes resources (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002). As a result, the consistent use of resources to combat against an increasingly demanding and unpredictable work environment may result in a worker becoming less capable of regulating his or her subsequent behaviour. In addition, CWBs are likely susceptible to delayed-reaction effects because workers who experience an increase in work stressors may wait until an opportune time to engage in CWBs to avoid getting caught by the organization or co-workers (Spector & Fox, 2005).

The current findings provide insight into the prevalence of delayed-reaction effects. Previous research has found mixed results for delayed-reaction effects of stressors on strains (Garst *et al.*, 2000; Meier & Spector, 2013). Prior studies, however, have examined whether initial standing in work stressors is associated with change in strain, whereas the current study was the first to examine how change in work stressors was associated with subsequent CWBs. Although a worker may learn to adapt to high levels of work stressors, the inherent uncertainty involved in change in work stressors may result in a steady depletion of resources and increased likelihood of subsequent CWBs. In sum, these results provide evidence that workers who experience an increase in work stressors may not only engage with CWBs immediately, but also may be more susceptible to CWBs at a later point in time.

### ***Moderating effects of personality***

Moderating effects of personality were examined for both the trend effect and delayed-reaction effect. COR describes personality characteristics as being key resources, which enable a worker to effectively acquire and manage other resources (Hobfoll, 2002). Agreeableness and conscientiousness (Costa & McCrae, 1992; Goldberg, 1990) were identified as key resources because of the conceptual overlap with resource acquisition and management. Agreeableness is conceptually linked to the acquisition and management of interpersonal resources because it reflects the degree to which a person is unaggressive, good-natured, cooperative, altruistic, has a propensity to trust, and is sensitive to the needs of other people. Conscientiousness is conceptually linked to the acquisition and management of task-oriented resources because it reflects the degree to which a person is ambitious, responsible, abides by ethical principles, and considers the consequences of behaviours before acting.

We found for Hypothesis 3a, which predicted that agreeableness would moderate the relationship between change in work stressors and change in CWB-Is (trend effect). Specifically, increases in work stressors were more strongly associated with increases in CWB-Is when workers were low in agreeableness compared to high in agreeableness. Consistent with COR, high-agreeableness workers are likely to have the ability to attain and appropriately allocate interpersonal resources to regulate their behaviours towards

others and cope more adaptively than low-agreeableness workers (Bowling & Eschleman, 2010). No support was found for Hypothesis 3b, however, which predicted that agreeableness would moderate the relationship between change in work stressors and subsequent levels of CWB-Is (delayed-reaction effect). Although one significant interaction was found, the moderating effect was not in the expected direction; there was a stronger positive relationship between change in organizational constraints and subsequent CWB-Is among workers high in agreeableness compared to workers low in agreeableness.

The unexpected direction of the significant interaction may be because a high-agreeableness worker may mismanage interpersonal resources for the long term by depleting resources in the short term. As previously noted, high-agreeableness workers were less likely to experience a trend effect, which is likely because the worker invested extensive amounts of interpersonal resources immediately. Although we expected that a high-agreeableness worker's propensity to trust would be a beneficial factor in acquiring interpersonal resources, the propensity to trust may have been detrimental in managing a long-term increase in work stressors. That is, a high-agreeableness worker may have invested interpersonal resources immediately because they trusted the organization to provide an effective working environment in the future. As a result, the use of interpersonal resources immediately may have left the high-agreeableness worker susceptible to subsequent strain.

A similar pattern of results was found for the moderating effects of conscientiousness. We found for Hypothesis 4a, which predicted that conscientiousness would moderate the relationship between change in work stressors and change in CWB-Os (trend effect). Specifically, increases in work stressors were more strongly associated with increases in CWB-Os among workers low in conscientiousness. Consistent with COR, high-conscientiousness workers are likely to have the ability to attain and appropriately allocate task-relevant resources to regulate their behaviours towards the organization and cope more adaptively than low-conscientiousness workers (Bowling & Eschleman, 2010). No support was found for Hypothesis 4b, which predicted that conscientiousness would moderate the relationship between change in work stressors and subsequent levels of CWB-Os (delayed-reaction effect). Although one significant interaction was found, the moderating effect was not in the expected direction. In fact, the moderating effect of conscientiousness was in the same direction as the moderating effect of agreeableness; there was a stronger positive relationship between change in organizational constraints and subsequent CWB-Os when workers were high in conscientiousness compared to workers low in conscientiousness.

The unexpected direction of the significant interaction may be because high-conscientiousness workers are so achievement-oriented that CWBs become a viable option in an effort to halt the increase in work stressors. Penney *et al.* (2011) note that high-conscientiousness workers may consider CWBs as means to achieve their goals during severe conditions (high stressors and low resources). Thus, an extended increase in work stressors over 6 months is likely similar to severe conditions within a static environment of high stressors and low resources. Overall, the results indicate that agreeableness and conscientiousness moderate the trend effects present in the work stressor–CWB relationship. However, mixed results were found regarding moderating effects of agreeableness and conscientiousness on the delayed-reaction effects.

### **Practical implications**

The nature of the work stressor–CWB relationship is likely more complex than could be understood utilizing cross-sectional data. More specifically, change in work stressors is likely to result in both immediate (trend effect) and subsequent (delayed-reaction effect) CWBs. When evaluating the consequences of changes in work stressors, organizations should include follow-up assessments to account for a potential delayed-reaction effect. The possibility of engaging in CWBs long after the initial exposure to an increase in work stressors is an indication that researchers and organizations may have underestimated the costs of increases in work stressors. Future studies are likely to find that CWBs are highly susceptible to a delayed-reaction effect because organizational policies often encourage workers to engage in more constructive responses to work stress and inhibit CWBs. As a result, CWBs may not be considered a viable option until time has passed and other coping methods have failed (Bowling & Eschleman, 2010).

Interestingly, the moderator effects suggest that managers should be particularly concerned about an increase in work stressors immediately resulting in CWBs among low-agreeableness or low-conscientiousness workers. However, personality differences may not be present for delayed-reaction effects on CWBs in all situations. Although researchers (Bowling & Eschleman, 2010; Penney *et al.*, 2011) have previously suggested that organizations may reduce CWBs by targeting stress interventions or selection efforts towards workers with specific personality profiles, managers should not assume that high-conscientiousness or high-agreeableness workers would engage in fewer CWBs in all scenarios. In fact, not including high-agreeableness and high-conscientiousness workers in stress interventions may be a disservice to those workers because they are still in need of learning how to manage long-term increases in work stressors and avoid subsequent CWBs (delayed-reaction effects).

### **Limitations and future research**

We should note a few limitations of the current research. First, the use of three waves of data collection, rather than four or more, limited our ability to test for nonlinear effects (Duncan *et al.*, 2006). In addition, our evaluation of delayed-reaction effects is limited because the stressor slope incorporates Wave 3 status into the estimation. The inclusion of additional time points would also enable future studies to examine whether changes in stressors during prior time points (e.g., Time 1 through Time 3) predict subsequent changes in CWBs (e.g., Time 3 through Time 5) and more accurately evaluate delayed-reaction effects. Latent difference score modelling, which requires four or more time points, enables researchers to simultaneously examine these more complex change models including reverse causal models (Eschleman & LaHuis, 2013). Additional time points may also enable researchers to address potential concerns with participants providing lower initial CWB scores. More specifically, a general increase in participants' CWB scores was detected across the three waves. This may be because participants became increasingly comfortable with reporting CWBs as the study progressed. The inclusion of an introductory wave of data collection that is not used for analyses would allow participants to become comfortable disclosing information about CWBs.

Given the significant moderating effects of conscientiousness and agreeableness, future researchers should continue to examine other potential moderators of the within-person relationship between change in work stressors and change in CWBs.

However, we encourage researchers to select moderator variables that are theoretically relevant to the regulation of CWBs through the protection of resources. For example, trait aggression reflects the degree to which a person is disagreeable, suspicious, quick to experience anger, and lacks ability to control behaviours that harm others (Bryant & Smith, 2001). A high-aggression worker is likely to mismanage interpersonal resources and engage in CWBs when faced with an increase in work stressors. Similarly, an organizational culture of deviance that develops from several workers engaging in CWBs (Pinto, Leana, & Pil, 2008) may inhibit a worker's ability to manage resources and inhibit CWBs.

Future research should examine circumstances in which there is a predicted negative relationship between change in stressors and change in CWBs. We predicted and found that the trend effect was more common for workers low in agreeableness/conscientiousness compared to workers high in agreeableness/conscientiousness. However, we made no predictions regarding the pattern of the relationship (i.e., weakly positive relationship, no relationship, or negative relationship) for workers high in agreeableness/conscientiousness. Our data indicate a potential negative relationship between change in stressors and change in CWBs for some workers. Caution should be taken when interpreting these effects, however, because we had no *a priori* predictions for this pattern.

### Summary

We examined the relationship between change in work stressors and change in CWBs within three waves (6 month time lag from Wave 1 to Wave 3). We found evidence for both a trend effect and a delayed-reaction effect. Regarding the trend effect, change in work stressors was positively associated with change in CWBs; regarding the delayed-reaction effect, change in work stressors was positively associated with greater subsequent CWBs. These results are consistent with the idea that workers who experience an increase in work stressors have depleted resources that hinder them from inhibiting CWBs (Hobfoll, 2002; Wang *et al.*, 2011). Two personality characteristics – agreeableness and conscientiousness – were examined as moderators of both the trend effect and delayed-reaction effect. As expected, the trend effect was stronger for either low-agreeableness or low-conscientiousness workers. Agreeableness and conscientiousness, however, did not moderate the delayed-reaction effects in the manner hypothesized. These results shed light into the within-person relationship between work stressors and CWBs.

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