Empirical Article

Antecedents of COVID-19 rumination: A three-wave study

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The COVID-19 pandemic has affected nearly every aspect of our lives and has caused a considerable rise in psychological complaints such as anxieties and depression. The majority of studies so far has focused on outcomes of the COVID-19 pandemic. To augment current knowledge, we focus on the antecedents of COVID-19 rumination. Specially, we examine how negative and positive work events prior to the outbreak influence individuals' coping capacity with regard to COVID-19 (i.e., the extent to which individuals have recurrent negative thoughts about COVID-19). Drawing on Conservation of Resources Theory (COR), we maintain that positive and negative work events prior to the pandemic can affect one's self-efficacy experiences and in turn can impact recurrent negative thoughts about COVID-19. Alongside exploring the proposed theoretical mediation model, we test one of the key assumptions of the COR theory: the notion of primacy of negative over positive affect that results from negative (vs. positive) work events. Three-waved data was collected among Dutch employees (T1 = 302; T2 = 199; T3 = 171); two prior to the pandemic and one at the onset of the outbreak. Results showed that positive work events increased self-efficacy, which in turn reduced COVID-19 rumination. Contrary to the expectation of primacy of the effects of negative work events, we found no significant impact of negative work events on individuals' COVID-19 rumination.

Key words: COVID-19, positive and negative events, rumination, self-efficacy, work events.

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INTRODUCTION

The recent COVID-19 pandemic has affected nearly every aspect of our life (Khosravi, 2020) as the virus itself and the restrictions for limiting its spread have changed how we go about our daily routines. Despite some success in containing the spread, both health and economic concerns keep rising. As we are being informed daily about the evolution of the spread including the emergence of mutations and long-term consequences, many people experience an increase in recurrent negative thoughts about COVID-19. These recurrent negative thoughts, which we understand as COVID-19 rumination, are natural reactions by individuals confronted with threatening or unpredictable circumstances, yet can have a range of adverse health and job performance effects (Baranik, Wang, Gong & Shi, 2017; Cropley & Purvis, 2003). For instance, rumination can trigger sleep disorders, emotional exhaustion and depression (Berset, Elfering, Lüthy, Lüthi & Semmer, 2011; Lyubomirsky, Caldwell & Nolen-Hoeksema, 1998; Mellings & Alden, 2000; Salguero, Extremera & Fernández-Berrocal, 2013). Overall, the capacity of rumination to deplete an individual's health and personal resources has been well featured in occupational and health psychology literature (Berset *et al*., 2011; Guastella & Moulds, 2007; Lyubomirsky *et al*., 1998; Mellings & Alden, 2000; Vahle-Hinz, Bamberg, Dettmers, Friedrich & Keller, 2014).

The body of research on personality characteristics in relation to different aspects of the COVID-19 pandemic is quickly growing, including studies about compliance with the restrictive measures and difficulties with dealing with these measures (Zettler, Schild, Lilleholt *et al*., 2020; Sibley, Greaves, Satherley *et al*., 2020) and studies about psychological distress caused by the pandemic such as COVID-19 anxiety and COVID-19 anxiety syndrome (Nikčević & Spada, 2020; Nikčević, Marino, Kolubinski, Leach & Spada, 2021; Lee, 2020), COVID-19-related fear (Ahorsu, Lin, Imani, Saffari, Griffiths & Pakpour, 2020) and threat (Conway, Woodard & Zubrod, 2020), and COVID stress (Taylor, Lin, Imani, Saffari, Griffiths & Pakpou, 2020). Despite the availability of these studies, it is still unclear which situational and personality factors are meaningful in predicting COVID-19 rumination over time. Drawing on the Conservation of Resources Theory (COR; Hobfoll, 2001), we aim to examine the extent to which positive and negative work events influence self-efficacy and in turn ruminative thoughts about COVID-19. Given that COVID-19 rumination is likely not only to be interconnected with an individuals' broad personal life, but also with their work (King & DeLongis, 2014), we are specifically interested in how work events may evoke COVID-rumination. Positive work events refer to events such as receiving positive feedback or praise, and meeting an established goal; while negative work events cover, among others, events such as receiving disrespectful treatment, and receiving negative feedback or criticism.

Developing knowledge on the predictors of pandemic-related rumination has practical and theoretical implications. Knowledge on the antecedents of COVID-19 rumination can help us to better predict which individuals may be struggling the most during the pandemic, may differ in their coping capacity, and may have greater need of support. Furthermore, by testing some of the key tenets of COR theory – the notion of gain and loss spirals – our

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study adds to the scarce knowledge on the situational factors that accelerate or help decrease negative mental states such as pandemic-related recurring negative thoughts. By exploring the mediating role of self-efficacy and thereby explaining the resource- and motivation-enhancing and depleting processes (triggered by positive vs. negative work events) that feed into COVID-19 rumination, we add credence to the perspective that there is considerable value to be gained from integrating the tenets of Self-Efficacy Theory (SET; Bandura, 1991) into COR.

THEORETICAL BACKGROUND

Prior research has argued that rumination is a highly dysfunctional cognitive strategy. Engaging in rumination can lead to various detrimental personal and work-related outcomes (King & DeLongis, 2014). Scholars have put forward that rumination is a reaction to stress that is passive, self-focused, and negative and that is characterized by repetitive and persistent thoughts about problems or achieving higher-order goals, often with negative cognitive and behavioral consequences (King & DeLongis, 2014; Martin & Tesser, 1996; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Treynor, Gonzalez & Nolen-Hoeksema, 2003). The repetitiveness of the thoughts and their negative self-related content is what makes rumination particularly harmful to the individual. It impairs recovery and triggers negative psychological states (Morrow & Nolen-Hoeksema, 1990; Puterman, DeLongis & Pomaki, 2010).

Individuals can ruminate about different life and work stressors they are confronted with and despite the widely recognized personality-related predisposition to ruminative thoughts, evidence from the past decade shows that rumination is not merely a trait but a state. For example, rumination shows significant within-person variability on a day-to-day basis, and it predicts a considerable variance in negative affect that the trait measures alone do not account for (Moberly & Watkins, 2008; Puterman et al., 2010). Psychological states such as rumination can occur when one is confronted with a life stressor that is significant to the individual. Rumination and thereby recurrent negative thoughts thus can affect everyone at some point in time.

The recent COVID-19 pandemic and its far-reaching consequences has become one of the most prevalent stressors we are confronted with. The danger the virus poses to the lives and health of many people and their loved ones, and the concerns about the social and economic consequences of the pandemic have a considerable negative impact on our physical and mental health (Fitzpatrick, Drawve & Harris, 2020; Rajkumar, 2020). A life stressor of such magnitude is likely to trigger reoccurring and persisting worries, giving rise to ruminative symptoms (Baiano, Zappullo, the LabNPEE Group & Conson, 2020; Satici, Saricali, Satici & Griffiths, 2020). Given that ruminative thoughts are typically set off by a stressor that is important to the individual, COVID-19 as a substantial life stressor can unlock such thoughts. In a sense, COVID-19 rumination, that is, recurrent negative thoughts about the pandemic, is akin to any other rumination because it is triggered by a powerful stressor that can have long-lasting negative consequences. Whereas usually the primary trigger of a ruminative episode is a specific stressful event, no event (stressful of otherwise) occurs as an incidence isolated from

everything else in our lives. There is always a multitude of other (circumstantial) events that have been taxing an individual and have been building up stress in the background. Even though some studies have attempted to identify the cause of the ruminative thoughts in terms of the direct trigger of the anxieties (e.g., Olatunji, Naragon-Gainey & Wolitzky-Taylor, 2013), much less attention has been given to the events (either positive or negative) preceding this trigger (or stressor) and how they can affect (i.e., enhance or weaken) the rumination experiences.

To better understand COVID-19 rumination and the extent to which people are affected by it, we study the individuals' exposure to positive and negative work events prior to the pandemic, as the combined effect of subsequent negative events (e.g., negative professional or personal experiences and later the pandemic itself) may cause a high level of COVID-19 rumination. Whereas accumulation of negative events, because they drain one's psychological and physical resources (Gross, Semmer, Meier, Kalin, Jacobshagen & Tschan, 2011), may increase the chance of negative coping strategies and mental states such as rumination, positive events prior to a major negative event (e.g., COVID-19 pandemic) may help prevent a rise in negative strategies, resulting in less reported ruminative thoughts about the virus. Prior studies have shown that negative work events can cause a rise in daily fatigue (Parrish, Zautra & Davis, 2008; Zohar, 1999; Zohar, Tzischinski & Epstein, 2003), decrease daily well-being (Zijlstra & Sonnentag, 2006) and increase in ruminative thoughts (Berset et al., 2011; Brosschot, Pieper & Thayer, 2005). These unfavorable effects are due to an ongoing loss of resources caused by increased demands for self-control, including controlling one's attention and regulating one's affect (Beal, Weiss, Barros & MacDermid, 2005; Gross et al., 2011).

According to Gross and colleagues (2011) coping with negative work events taps into one's self-control – a limited resource that becomes scarcer with every subsequent negative episode that draws on this resource (Muraven & Baumeister, 2000). In general, negative events are set to drain one's coping capacity, especially if they continue for an extended period of time (Brosschot et al., 2005). Because the negative events require cognitive and emotional resources for dealing with them (e.g., searching for solutions to avoid potential failure) and for dealing with the negative affects they evoke (e.g., anxieties about the problem and about one's ability to resolve it), investing such resources for a prolonged period of time may cause feelings of being overextended and inefficient. Low self-efficacy is likely to result from these feelings of being depleted because of the ongoing environmental demands. Stressful conditions drain resources and increase the need to replenish resources (Hobfoll, 2001).

In contrast, positive conditions or events can generate additional resources, such as self-efficacy, by inspiring new ideas and improving the problem-solving capacity of individuals or by contributing to a better social climate (Bono, Glomb, Shen, Kim & Koch, 2013). Positive work events, through generating positive emotions, widen the scope of possible solutions, broaden the individual's thought–action repertoires and help create physical, intellectual, and psychological resources (Fredrickson, 2001) all of which can boost one's self-efficacy. This resource-building capacity of positive events can have lasting benefits as resources can be accumulated in reserve (i.e., 'resource caravans'; Hobfoll,

2001) and be used towards dealing with future threats and reducing stress. Hobfoll (2001) proposes a primacy of the negative affective reactions to stressors. Specifically, even though learning theory predicts that people can adapt to negative events because they can typically overcome them, individuals do not seem to internalize this knowledge, because they tend to overestimate the duration and intensity of their affective reactions to negative events (Hobfoll, 2001). This phenomenon occurs because individuals tend to ignore the robustness of their psychological immune system, especially given that the psychological immune system does not seem to augment in reaction to positive events.

In keeping with COR (Hobfoll, 2001) and earlier empirical evidence, self-efficacy (i.e., a person's own evaluation of their ability to successfully achieve their goals) serves as a personal resource; and resources can be invested to help deal with stressors and to build stress resistance (Bandura, 1991; Scheier & Carver, 1985). Resources such as self-efficacy can be desired in their own right as well as a means towards the obtainment and maintenance of resource reservoirs or caravans that can be used to cope with future stressors (Hobfoll, 1989, 2001). For instance, in demanding situations being self-efficacious is usually related to having access to or availability of other resources (e.g., optimism and social support) and better coping styles (Hobfoll, 2001; Kobasa & Puccetti, 1983; Thoits, 1994). In contrast, having low self-efficacy can be linked to less social support and poorer coping strategies (Hobfoll, 2001; Kobasa & Puccetti, 1983; Thoits, 1994). Applied to our theoretical model, individuals who are exposed to demanding conditions (i.e., negative work events) are likely to report poor self-efficacy, while those who are experiencing positive work events may be more self-efficacious. Building further on COR, self-efficacious individuals are more likely to cope well with challenging situations (i.e., display more effective, active and less maladaptive coping styles), while those who are less self-efficacious are more likely to engage in poor coping strategies such as rumination.

Over the past two decades, a considerable number of studies has set to investigate positive work events and the outcomes they engender (Bono *et al.*, 2013; Koopmann et al., 2016). Many of these studies draw their theoretical underpinnings from broaden-and-build theory (Fredrickson, 2001) and from the affect symmetry rationale, which assume that positive experiences (e.g., positive work events) unlock positive emotions, which in turn result in positive outcomes such as positive cognitions, better health and goal achievement (Bono *et al.*, 2013; Gross *et al.*, 2011). Following this reasoning, Hobfoll (2001) has argued that positive events have a stress-limiting effect, because they generate positive or success experiences, which build one's resources, such as self-efficacy.

Yet, the empirical evidence from the past two decades of research is less clear-cut. Whereas studies have consistently confirmed the negative effect of negative work events on well-being (Bono *et al.*, 2013; Miner, Glomb & Hulin, 2005), empirical contributions examining the effect of positive work events on well-being brought far more ambiguous findings (Gross *et al.*, 2011; Beal *et al.*, 2005; Parrish *et al.*, 2008; Zohar, 1999; Zohar *et al.*, 2003). This may be so because positive work events demand attention and allow exploration of new opportunities (Beal *et al.*, 2005; Zohar *et al.*, 2003), which on its own requires resources and drains energy. Of course, the loss of energy due to investment of

resources may be limited because positive experiences also allow individuals to regain resources (Folkman & Moskowitz, 2000).

Taken together, we pose that positive work events and negative work events may be different in their effect on COVID-19 rumination, yet the mechanism via which they work (self-efficacy) is expected to be the same. Hence, we hypothesize:

Hypothesis 1:   Self-efficacy fully mediates the negative relationship between positive work events and COVID-19 rumination.

Hypothesis 2:   Self-efficacy fully mediates the positive relationship between negative work events and COVID-19 rumination.

METHOD

Sample and procedure

Our respondents were employed in various Dutch organizations. Data was gathered via an online questionnaire in the spring of 2019 (T1; n = 302), six months later in autumn 2019 (T2; n = 199), and again six months later in the spring of 2020 (T3; n = 171). After matching the responses of each wave, we were left with 145 usable responses. From this set of respondents, 50 percent were female; the average age was 47.2 (SD 12.3).

Similarly to many other studies about rumination (e.g., Moberly & Watkins, 2008), we gathered data using self-reports. Self-reported data are associated with a higher risk on common method bias. Yet, given the objective of our study, that is, identifying predictors of individual ruminative thoughts, the use of self-reports is warranted (Conway & Lance, 2010). Concerns on using self-reported measures are minimal when the outcome variable captures behavior rather than performance (Heidemeier & Moser, 2009). As external raters usually rely on general impressions when assessing another person (Lance, LaPointe & Fisicaro, 1994) it is improbable that they would be able to notice the private thoughts of an individual that determines their rumination. Nonetheless, we employed procedural remedies in our study, closely following recommendations by Podsakoff, MacKenzie, Lee and Podsakoff (2003), Conway and Lance (2010), and Spector (2006), to defend against potential bias. Among others, the anonymity of respondents was protected and respondents were informed that we were purely interested in their opinions and there were no right or wrong answers. Participation was voluntary and upon entering the questionnaire participants were asked to provide their informed consent. Altogether these measures reduce respondents' evaluation apprehension bias as well as social desirability bias (Podsakoff *et al.*, 2003). Most importantly, data about our dependent variable was collected six months later than data on the mediating variable, which in turn was collected six months after the predictor variable. All in all, we expect the risk for common method bias in our dataset to be low.

Measures

All variables were measured using multiple-item scales closely following internationally validated scales. The survey covered the following construct variables.

COVID-19 rumination was measured with six items from Nikolova, Caniëls and Curseu (2021) (α = 0.85). The scale ranged from 1 = 'totally disagree' to 5 = 'totally agree.' An example item is 'I am worried about the coronavirus (COVID-19)'. This scale reflects the degree in which individuals experience recurrent negative thoughts about the pandemic.

Positive and negative work events were measured by four and five items respectively from the events scale of Koopmann, Lanaj, Bono, and Campana (2016), which mirror positive and negative work events items from Bono *et al.* (2013). The scale encompasses a limited set of work events that have been shown to occur on a regular basis during a work day (Bono *et al.*, 2013). The scale ranged from 1 = 'never' to 5 = 'always.' An example item of a positive event is 'In the past two

weeks, I accomplished the goals I had set for myself'; and a negative event 'In the past two weeks, I was pressured to do something I did not want to do'. We checked whether positive and negative work events could be used as two separate variables. Confirmatory factor analysis (CFA) confirmed the two-factor structure of the work events scale. Specifically, the two factor model at T1 (χ^2 = 93.858; df = 26; RMSEA = 0.093; CFI = 0.913; TLI = 0.880; SRMR = 0.051) showed a better fit with the data than the one factor model at T1, which conflates the two dimensions into one variable (χ^2 = 232.284; df = 27; RMSEA = 0.159; CFI = 0.738; TLI = 0.650; SRMR = 0.094). The Vuong (1989) closeness test indicated that the two-factor model fits better than the one factor model ($p < 0.000$). The estimated reliability of the positive work events scale was $\alpha = 0.79$, and the negative work events scale $\alpha = 0.74$.

Self-efficacy was assessed by three items from the Short version of the General Self-Efficacy Scale (Chen, Gully & Eden, 2001). The scale was anchored by 1 = 'totally disagree' and 5 = 'totally agree.' An example item is 'Even when things are tough, I can perform quite well'. In our sample, estimated reliability was $\alpha = 0.89$.

We assessed several control variables, including age, gender, social class and education level, because other studies have suggested that the demographic background of individuals may account for variance in their rumination (Puterman *et al.*, 2010; Ando, Giromini, Ales & Zennaro, 2020). Age was measured in years. Gender was measured as male (coded as '1') versus female (coded as '2'). Social class, that is, social economic status, consists of five levels from high ('1') to low ('5'). Education level ranges from lower educational training '1' to university level education '7'. Furthermore, we included a variable for the number of days after lockdown, reasoning that immediately after lockdown rumination may be higher than after a few days.

Analytical strategy

To test the hypothesized mediation effects, we used the R package Rosetta (Peters, 2019), which is based on a structural equations analysis with Lavaan (Rosseel, 2012), which facilitates bootstrapping ($n = 5,000$; Preacher & Hayes, 2008). The bootstrap method is nonparametric and therefore does not impose an assumption of normality. Moreover, it provides more accurate probability estimates compared to other testing approaches (Shrout & Bolger, 2002). Measures were mean-centered to eliminate any multicollinearity problems. We checked for robustness of the model by investigating alternative specifications, such as reversing the order between mediator and outcome variables. These analyses indicated that the variance explained by alternative model specifications were less than the variance explained by our current model specification.

RESULTS

Table 1 provides insight into the means, standard deviations and correlations between the variables in our study. The demographic

control variables do not structurally relate with any of the central variables, as all correlations are below 0.3. Also, the control for the number of days after lockdown was not significantly associated with any of the key variables in our study. In accordance with recommendations of Bernerth and Aguinis (2016) we chose to increase the power of our tests by leaving the control variables out of the further analyses. As expected, we find a negative and significant correlation between positive and negative work events. The two-factor CFA confirms the distinctiveness of the two-factor model.

The proposed mediation model fits the data very well (χ^2 = 193.886; df = 129; $\chi 2/df$ = 1.50; CFI = 0.934; TLI = 0.922; RMSEA = 0.059) (Kline, 2005). Figure 1 displays the results for the partial relationships in our hypothesized model. We find that, except for one (b_N), all partial relationships (a-path as well as b-path) are significant. The path from positive work events towards self-efficacy has a positive coefficient and the path from self-efficacy to COVID-19 rumination has a negative coefficient, which is in accordance with our expectations.

Table 2 presents the results of two mediation models. Model A pertains to positive work events and model B concerns negative work events. Hypothesis 1 predicted that self-efficacy would mediate the relationship between positive work events and COVID-19 rumination. The mediated path from positive work events to COVID-19 rumination is significant ($b = -0.044$, $p < 0.05$), as the 95% bias-corrected confidence interval (CI) for the indirect effect (derived from 5,000 bootstrap samples) did not contain zero for positive work events, 95% CI = [−0.089, −0.008]. This pattern of results is consistent with a mediating effect of self-efficacy in the relationship between positive work events and COVID-19 rumination, thereby supporting Hypothesis 1.

Hypothesis 2 predicted that self-efficacy would mediate the relationship between negative work events and COVID-19 rumination. The results of the analysis shows that the total indirect effect of mediation through self-efficacy is insignificant for negative work events ($b = 0.039$, $p = 0.07$, CI = [0.01, 0.09]). Hence, we do not find support for Hypothesis 2 in our sample.

DISCUSSION

Drawing on the tenets of Conservation of Resources Theory (COR), our study found that positive work events were associated

Table 1. *Means, standard deviations, and correlations (n = 145)*

Variable	M	SD	1	2	3	4	5	6	7	8
1. COVID-19 rumination T3	3.14	0.81								
2. Positive work events T1	4.63	0.93	−0.22**							
3. Negative work events T1	2.81	0.86	0.21**	−0.53**						
4. Self-efficacy T2	3.69	0.71	−0.17*	0.24**	−0.04					
5. Number of days after lockdown T3	4.08	1.70	0.03	0.11	−0.06	0.10				
6. Gender	1.50	0.50	0.10	−0.04	0.03	−0.16	0.09			
7. Education level	4.90	1.49	−0.14	0.13	0.02	0.29**	0.14	−0.07		
8. Age	47.18	12.33	0.13	0.01	0.10	0.03	−0.06	−0.04	−0.27**	
9. Social class	2.28	1.20	0.11	−0.08	0.01	−0.23**	−0.04	0.02	−0.65**	0.25**

Notes: M and SD are used to represent mean and standard deviation, respectively.
*Indicates $p < 0.05$.
**Indicates $p < 0.01$. T1, T2 and T3 denote measurement moments 1, 2 and 3, respectively.
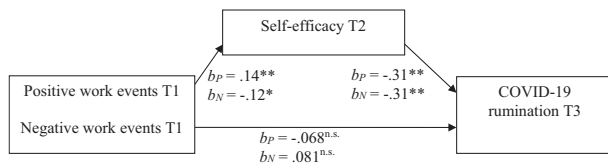
Fig. 1. Results for the hypothesized model.
Note: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

with increased self-efficacy, which in turn was associated with reduced COVID-19 rumination. Contrary to the expectation of primacy of the effects of negative work events, we found no significant impact of negative work events on individuals' recurrent negative thoughts about the pandemic.

Implications for theory

Our findings have several important theoretical implications. First, whereas the majority of the studies has focused on the physical and psychological consequences of the COVID-19 pandemic, our findings add to the currently scarce knowledge on the personal factors that accelerate or help decrease negative mental states during the pandemic. We explained the resource- and motivation-enhancing and depleting processes (triggered by positive vs. negative work events) that feed into COVID-19 rumination by exploring the mediating role of self-efficacy. Such exploration illustrates that there is considerable value to be gained from integrating the tenets Self-Efficacy Theory (SET; Bandura, 1991) into COR (Hobfoll, 2001). We show that self-efficacy is a key resource needed to build resistance to COVID-19 rumination. In this regard, we enrich SET by developing an understanding of how self-efficacy beliefs evolve from the situational context, highlighting that efficacious individuals benefit from positive work events, while negative work events can neither harm nor benefit self-efficacy.

Second, we drew from COR to more fully understand the implications of positive and negative events for negative outcomes in a work context. Previous research has emphasized the resource-building capacity of positive events (Gross *et al.*, 2011) and the resource-depleting effect of negative events (Zohar

et al., 2003). We find that positive work events are associated with diminished negative outcomes, while negative work events do not display a significant effect on outcomes. This finding seems to contradict the notion of primacy of negative over positive affect that results from negative (vs. positive) events, as proposed by COR theory. Yet, our finding is largely in line with the results by Zohar *et al.* (2003) who show that negative events (disruptive events) have shorter after work effects than positive events (goal-enhancing events). Compared to positive events, negative events appear to be less readily available in memory (Taylor, 1991), a phenomenon that has been labeled 'Pollyanna principle' by Matlin and Strang (1978). Our findings are also in line with learning theory (Taylor, 1991), which suggests that negative events can be overcome successfully most of the time and therefore may not have stronger impact on our psychological immune system than positive events. Our findings indirectly support this notion, as we find no effect from negative work events on COVID-19 rumination (via self-efficacy), yet a significant effect from positive work events. This asymmetry may be caused by the fact that when experiencing aftereffects of work events (that potentially give rise to ruminative thoughts) one is better able to recall joy (from positive work events) than discomfort (from negative work events) (Martela, Ryan & Steger, 2018; Taylor, 1991). An additional possible explanation for the asymmetry may be found in studies about the associations between events (positive and negative) and self-esteem (e.g., Pietromonaco & Markus, 1985). Negative events are likely to be attributed to external factors when individuals entertain a high self-esteem (Taylor, 1991). This external attribution of negative events could explain why we find that negative work events are not significantly related to self-efficacy. A final explanation could lie in the fact that our study assessed the impact of a limited set of *work* events, not *life* events. Negative life events, such as loss of a loved one, experience of violence, disease diagnosis and alike could potentially lead to different results and a different impact on self-efficacy. While the work events considered in our study occur frequently, they may have a less traumatizing effect than negative life events. As such, the impact of negative *life* events on COVID-19 rumination may indeed be mediated by self-efficacy.

Table 2. *The mediating role of self-efficacy in the relationship between work events and COVID-19 rumination (n = 145)*

	Model A. Positive work events [95% bias-corrected CI]	Model B. Negative work events [95% bias-corrected CI]
Total effect		
Work events ➔ COVID-19 rumination	−0.11 (0.12) [−0.26; 0.032]	0.12 (0.07) [−0.02; 0.26]
Partial effect toward self-efficacy (a-path)		
Work events ➔ self-efficacy	0.14** (0.01) [0.032; 0.25]	−0.12* (0.05) [−0.22; −0.02]
Partial effects from self-efficacy to COVID19 rumination (b-path)		
Self-efficacy ➔ COVID-19 rumination	−0.31*** (0.00) [−0.52; −0.096]	−0.31*** (0.00) [−0.53; −0.11]
Direct effects (c'-path)		
Work events ➔ COVID-19 rumination	−0.068 (0.36) [−0.22; 0.068]	0.081 (0.06) [−0.03; 0.19]
*Indirect effects (a*b)*		
Through self-efficacy	−0.044* (0.04) [−0.089; −0.008]	0.039[†] (0.02) [0.01; 0.09]

Notes: Unstandardized coefficients are reported, independent variables were centred, *p*-values between brackets.
***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, [†]$p < 0.10$.

Implications for practice

Our study holds several implications for practitioners. Evidence on the situational and personal predictors of COVID-19 rumination may help health professionals and organizations to put emphasis on developing measures fostering the experience of positive work events as well as self-efficacy. Changing people's behavior and reducing their rumination about COVID-19 requires a change in people's beliefs and reasoning. A qualitative study by Hendricks (2014) suggests that self-efficacy beliefs can be stimulated by providing positive enactive mastery experiences, which can occur when employees are provided with opportunities to demonstrate their capability, thereby boosting self-confidence (Bandura, 1991).

Our study indicates that individuals who experience positive work events may be more resilient against major stressors as they tend to ruminate less about them because they feel more self-efficacious. Hence, to reduce future recurrent negative thoughts, managers could strive to increase positive work events by engaging in constructive dialog and emphasizing the strengths of employees and their accomplishments. Also, self-development practices (e.g., mindfulness) may be instrumental in learning how to increase one's self-efficacy, as self-efficacy was demonstrated to help reduce rumination related to COVID-19.

Limitations and future research

Our study has several limitations, each of which leads to opportunities for future research. A generic limitation of this type of study is that typically self-reported measures are used, which may raise concerns for common method bias. We minimized the risk of common method bias in several ways, closely following recommendations by Podsakoff, (2003). Most importantly, we gathered data at three moments in time: data on the dependent variable was gathered in the third wave, while data on the independent and mediator variables were gathered at the first and second wave, respectively. Nevertheless, future studies may want to pursue alternative research designs to further minimize the risk of common method bias. Furthermore, we used Nikolova *et al.*'s (2021) measure to capture the degree in which individuals experience recurrent negative thoughts about the pandemic. This scale includes items that capture not only rumination but also worry and fear. Studies using a scale that uniquely assesses covid rumination may want to replicate our study and check its robustness towards using a narrow rumination measure.

Second, our sample consists of employees from various Dutch organizations and our results may not be generalizable to samples from other countries. Government measures against COVID are differing greatly across countries with some countries being quick and strict in issuing practices and regulations to limit the spread of COVID-19, while other countries adopting more relaxed approaches to protect the economy in the short run. Future studies could incorporate samples from various countries to see whether our findings apply to broader populations.

Third, although we used a three-wave design to test our mediation model, we did not include auto-correlations. Obviously, COVID-19 rumination could only be measured in the third wave, as our earlier measurements were done at a time where COVID-19 did not yet exist. Further research may employ more waves of COVID-19 rumination to test the robustness of our proposed model.

Finally, the fact that we found no significant effect from negative work events to COVID-19 rumination could be an effect of the specific time lag we used between measurements. Asymmetry Effects Theory (Taylor, 1991) and Negativity Bias Theory (Rozin & Royzman, 2001) pose that positive events tend to have longer-lasting effects than negative events. Potentially, shorter time-lags could be better suited to test the impact of negative events. The impact on self-efficacy may have 'faded' over time and may therefore not have been captured in the second measurement. Similarly, potential habituation effects may have occurred, that could have reduced recurrent negative thoughts about the pandemic. A study about how the COVID-19 rumination evolved during the first three weeks after restrictive measures were introduced showed a drop in the overall level of rumination, indicating potential habituation (Nikolova *et al.*, 2021). Future studies may test whether our results are robust to using a different time lag between measurements.

Despite these limitations, the current study has augmented knowledge about the antecedents of COVID-19 rumination, as well as added to theory development by testing some of the key tenets of COR theory – the notion of gain and loss spirals – in the unprecedented circumstances of a pandemic.

Prior to collecting the data, the characteristics of the study design were assessed and approved by the institutional Ethics Committee (Request nr. 200,269).

DATA AVAILABILITY STATEMENT

Data availability statement Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

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