

Work Rumination and Its Double-Edged Sword Effects

Authors: Zhang Jing, Li Weihe, Shi Yanwei, Zhang Nan, Ma Hongyu, Ma Hongyu

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Abstract

Work rumination refers to conscious, repetitive work-related thoughts that occur in situations where such thinking is not required, and can be divided into two dimensions: work-related affective rumination and work-related problem-solving deliberation. The impact of work rumination on individual health, work performance, and well-being exhibits a “double-edged sword” effect. The underlying mechanisms of this effect can be explained by perseverative cognition theory, the stress cognitive activation model, and the cognitive resource perspective theory. Future research should analyze the boundary conditions that influence this double-edged sword effect, explore approaches to mitigate its negative effects while enhancing its positive effects, and expand both the analytical perspectives on the psychological mechanisms underlying the double-edged sword effect and the levels at which this effect operates.

Full Text

Work-Related Rumination and Its “Double-Edged Sword” Effect

ZHANG Jing^{1,2}; **LI Weihe**¹; **SHI Yanwei**¹; **ZHANG Nan**¹; **MA Hongyu**¹ ¹ School of Psychology, Central China Normal University, Wuhan 430079, China

² School of Psychology, Xinxiang Medical University, Xinxiang 453003, China

Abstract

Work-related rumination (WRR) refers to conscious, recurrent work-related thoughts that occur without being prompted by the situation. It comprises two dimensions: work-related affective rumination and work-related problem-solving pondering. WRR exerts a “double-edged sword” effect on individual

health, work outcomes, and well-being. The internal mechanisms of this effect can be explained by perseverative cognition theory, the cognitive activation model of stress, and the cognitive resource perspective. Future research should analyze the boundary conditions influencing this double-edged sword effect, seek pathways to reduce its negative effects while enhancing its positive effects, and expand the analytical perspectives on the psychological mechanisms and functional levels of this effect.

Keywords: work-related rumination (WRR); double-edged sword effect; perseverative cognition theory; cognitive activation model of stress; cognitive resource perspective

In today's rapidly developing economy, increasing organizational competition and escalating job demands have intensified the psychological phenomenon of employees continuing to focus on work during non-work hours (Felstead, Gallie, & Green, 2002; Pravettoni, Cropley, Leotta, & Bagnara, 2007; Kinman, Clements, & Hart, 2017; Weinberger, Wach, Stephan, & Wegge, 2018). Whether in small-scale analyses of several hundred participants (Michalianou, 2011) or large-scale surveys of over a thousand individuals (Gallie, White, Cheng, & Tomlinson, 1998), research consistently shows that at least 70% of employees experience work-related thoughts that persist after work, with this proportion continuing to grow (Felstead et al., 2002). This inability to mentally "switch off" from work after hours represents a form of rumination known as work-related rumination (WRR; Cropley & Zijlstra, 2011), defined as a state in which individuals repeatedly think about work-related problems and events outside of work (Querstret & Cropley, 2012). Over the past decade, occupational health psychology has increasingly recognized the significant impact of WRR on employee well-being and work life, typically viewing it as a negative psychological phenomenon in research related to occupational stress. For instance, individuals with high levels of WRR experience greater emotional exhaustion (Deselms, 2016; Flaxman et al., 2018; Perko, Kinnunen, & Feldt, 2017) and lower well-being (Flaxman, Julie, Bond, & Kinman, 2012; Locatelli, Kluwe, & Bryant, 2012). However, other studies have found that actively reflecting on work during non-work time can predict proactive behaviors and organizational citizenship behaviors, thereby enhancing well-being (Binnewies, Sonnentag, & Mojza, 2009). Thus, WRR may function as a "double-edged sword," exerting both negative and positive influences on psychological and behavioral outcomes.

Currently, international research on WRR is growing annually but remains in its early stages, while domestic research on this phenomenon is even more limited. In light of this, this paper provides a comprehensive review of existing WRR research. After clarifying its conceptualization and dimensions, we focus on examining its "double-edged sword" effects on individual work life and the underlying psychological mechanisms, while also outlining future research directions. We aim to provide materials for domestic scholars to examine and expand the conceptualization and characteristics of WRR within Chinese cultural contexts. Moreover, whereas previous research has primarily focused on

the negative effects of WRR, this study's review of the "double-edged sword" effect can promote more comprehensive analyses of WRR's consequences and provide insights into how to reduce its negative impacts while enhancing its positive effects.

1.1 The Conceptualization of Work-Related Rumination

The term "work-related rumination" was first introduced by Cropley and Zijlstra in 2011, referring to repetitive thoughts related to work problems. This initial conceptualization was negative, considered a primary obstacle to employee recovery. For example, Cropley and colleagues conducted a series of studies demonstrating that increased rumination about work content among high-stress employees caused sleep impairment (Cropley & Millward, 2003; Cropley, Dijk, & Stanley, 2006). However, Michalianou (2011) found that individuals do not always passively review negative work experiences; they may also actively think about work because they enjoy it or find problem-solving gratifying, seeking methods to accomplish tasks and achieve goals. Goal progress theory similarly posits that people can ruminate on either negative or positive content, viewing rumination as conscious thoughts centered on instrumental themes that re-emerge in environments lacking direct demand for such thoughts—a form of self-regulation that serves the positive function of tracking goal progress (Martin, Shrira, & Startup, 2008; Castro, Martínez, & Abarca, 2019). Drawing on this perspective from goal progress theory, Syrek and Antoni (2014) proposed a more comprehensive definition of WRR: conscious, recurrent work-related thoughts that occur without being prompted by the situation (typically after work or during leisure time). This definition specifies the timing of WRR and does not limit the valence of rumination content to negative aspects. Therefore, this study adopts this conceptualization of WRR.

Under the influence of the positive perspective on rumination, Cropley's team, combining interview and factor analysis results, proposed two dimensions of WRR: affective rumination and problem-solving pondering. These dimensions differ in their focus (emotion vs. problem-solving) and valence (negative vs. positive) (Kinnunen et al., 2017) and exhibit moderately strong positive correlations ($r = 0.61$, $p < 0.001$; Querstret & Cropley, 2012). Affective rumination represents a negative cognitive state focused on negative emotional experiences from work, characterized by intrusiveness, pervasiveness, and recurrence, generating negative emotions and tension or annoyance. Problem-solving pondering, in contrast, reflects sustained mental examination of a specific problem or evaluation of previous work to identify improvements, including considering problems from new angles, identifying and removing obstacles, and developing creative solutions, thereby generating positive emotions and pleasant experiences through problem-solving progress. For most individuals, both types of WRR coexist within a given period (Kinnunen et al., 2017).

1.2.1 Work-Related Affective Rumination and Depressive Rumination

Rumination initially attracted scholarly attention due to its high prevalence among individuals with depression. This form of rumination, focused on depressive thoughts and related symptoms, is termed depressive rumination—a maladaptive response style and individual trait (Nolen-Hoeksema, 1987). As research progressed, scholars recognized that rumination could represent both a response tendency and a universal thought form based on specific contexts, namely state rumination (Robinson & Alloy, 2003).

Both work-related affective rumination and depressive rumination involve emotion and share negative valence. Depressive rumination represents a response style among clinical patients with depression and anxiety, constituting trait rumination focused primarily on symptom expression and negative self-cognition. This response style intensifies and prolongs depressive episodes (Bastin, Mezulis, Ahles, Raes, & Bijttebier, 2015). Work-related affective rumination, however, depends on work contexts and arises from blocked work-related goal progress (Martin & Tesser, 1996), representing state rumination focused on work-related feelings—a routine form of rumination that any employee may experience (Kinunen et al., 2017).

1.2.2 Work-Related Problem-Solving Pondering and Reflective Rumination

Reflective rumination involves individuals purposefully adjusting cognition to seek solutions that alleviate depressive symptoms, representing active contemplation of one's emotions (曾庆巍, 刘爱书, 钟继超, 2016). Empirical research shows that reflective rumination may cause negative affect in the short term but can reduce negative emotions over time through resolution of emotional problems (Verhaeghen, Joormann, & Aikman, 2014), thus representing an adaptive component of depressive rumination. Work-related problem-solving pondering shares similarities with reflective rumination in that both involve purposeful cognitive adjustment. However, problem-solving pondering seeks solutions for work-related problems, does not necessarily involve emotional components, and is not necessarily used for mood regulation (Cropley & Zijlstra, 2011; Syrek, Weigelt, Peifer, & Antoni, 2017). Moreover, the core distinction lies in reflective rumination being a form of trait-based rumination response style, whereas problem-solving pondering constitutes state-based work rumination.

1.2.3 Work-Related Rumination and Psychological Detachment from Work

Psychological detachment from work refers to mentally disengaging from work and refraining from thinking about work-related problems during non-work time, representing an important prerequisite for recovery (Sonnentag & Fritz, 2015). WRR involves sustained thinking about work problems during non-work time, during which individuals are clearly not cognitively detached from work. Empir-

ical research also demonstrates significant negative correlations between WRR and psychological detachment (Cropley, Michalianou, Pravettoni, & Millward, 2012). However, the opposite of psychological detachment does not fully equate to WRR, because psychological detachment assumes that thinking about work during leisure time is necessarily detrimental to recovery—yet individuals do not always ruminate negatively about work (Cropley & Zijlstra, 2011), and problem-solving pondering does not adversely affect recovery (Vahle-Hinz, Mauno, De Bloom, & Kinnunen, 2017). Therefore, non-detachment does not necessarily mean WRR, whereas WRR necessarily entails non-detachment. Cropley and Zijlstra (2011) characterize this relationship as an incompatible state.

1.3 Measurement of Work-Related Rumination

Current measurement approaches for WRR primarily include three methods. First is the Work-related Worry and Rumination Scale developed by Flaxman et al. (2012), comprising five items: one from the Rumination-Reflection Questionnaire (RRQ), two from the Emotion Control Questionnaire (ECQ), one from the Worry Domains Questionnaire (WDQ), and one from the Perfectionism Cognitions Inventory (PCI). Using a 5-point scale, it demonstrates Cronbach's alpha coefficients above 0.85 (Flaxman et al., 2012; Yuan, Barnes, & Li, 2018; Flaxman et al., 2018). This scale focuses on cognitive content centered on work stressors or problems, emphasizing potential negative outcomes of past or future events (Flaxman et al., 2012). Consequently, this measurement cannot comprehensively capture the valence of WRR. Moreover, the scale's items originate from diverse sources and may not precisely measure WRR. For instance, the Rumination-Reflection Questionnaire primarily measures depressive rumination response style (Nolen-Hoeksema & Morrow, 1991), while worry—a hallmark feature of anxiety disorders—primarily concerns the future, whereas rumination more often concerns the past (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002).

The second approach uses selected items from the Cognitive Irritation subscale of the Irritation Scale (IS) developed by Mohr's team (Mohr, Müller, Rigotti, Aycan, & Tschan, 2006). This subscale contains three items using a 7-point scale, with internal consistency coefficients above 0.76 (Syrek & Antoni, 2014; Vahle-Hinz, Bamberg, Dettmers, Friedrich, & Keller, 2014). Researchers primarily use two items that reflect rumination about work content during non-work time: “Even at home, I often think about problems at work” and “Even on vacation, I think about problems at work.” These items do not capture the emotional valence of rumination content, and their reliability warrants improvement.

The third and currently most widely used approach is the Work-Related Rumination Questionnaire (WRRQ). Developed by Cropley's team (2012) based on interviews, this dedicated WRR measure initially yielded three factors through factor analysis: affective rumination, problem-solving pondering, and distraction (measuring how easily employees can avoid WRR). The distraction factor correlated significantly negatively with the other two factors (Cropley et

al., 2012). Since the distraction subscale does not directly measure WRR, researchers have gradually abandoned it in subsequent studies (Querstret, Cropley, Kruger, & Heron, 2015; Kinnunen et al., 2017; Syrek et al., 2017; Firoozabadi, Uitdewilligen, & Zijlstra, 2018). The currently accepted WRRQ comprises two subscales—*affective rumination* and *problem-solving pondering*—each containing five items with factor loadings above 0.60. Using a 5-point scale ranging from 1 (“almost never”) to 5 (“always”), respondents indicate the frequency of experiencing relevant thoughts during leisure time, with higher scores indicating greater WRR levels. Analyses of data from the UK, Germany, the US, and other countries show Cronbach’ s alpha coefficients above 0.80 for both subscales (Querstret & Cropley, 2012; Syrek et al., 2017; Demsky, Fritz, Hammer, & Black, 2019; Van Laethem, Beckers, De Bloom, Sianoja, & Kinnunen, 2018). Confirmatory factor analysis also demonstrates good validity indices (Syrek et al., 2017; Weigelt, Syrek, Schmitt, & Urbach, 2019).

In summary, the currently most widely used WRRQ demonstrates comprehensive factor structure and good reliability and validity. However, all existing WRR measures were constructed within Western cultural contexts, whereas Chinese occupational values differ from those of Europeans and Americans by placing greater emphasis on work’ s social contribution (Elizur, Borg, Hunt, & Beck, 1991). Driven by this strong sense of social responsibility, Chinese employees may have higher aspirations for improving and perfecting their work. Therefore, adapting Western scales and particularly developing WRR measures suitable for Chinese cultural contexts represent important future research directions.

2 The “Double-Edged Sword” Effect of Work-Related Rumination

Watkins (2008) proposed that whether rumination produces constructive or unconstructive outcomes depends on whether it helps or hinders goal progress. Research on WRR’ s consequences supports this view. This section reviews and organizes the positive and negative effects of WRR on individual work and life.

2.1 Positive Effects of Work-Related Rumination

The positive effects of WRR primarily manifest in the impact of work-related problem-solving pondering on employee health, well-being, and work performance. Regarding health, numerous studies have focused on WRR’ s effects on sleep, yet findings on the relationship between problem-solving pondering and sleep remain inconsistent. For example, Querstret and Cropley (2012) found that employees’ post-work problem-solving pondering positively correlated with lower sleep quality. However, Syrek et al. (2017) discovered in a three-month longitudinal study that problem-solving pondering marginally significantly negatively correlated with sleep impairment. This suggests that problem-solving pondering may negatively affect sleep in the short term but could ultimately im-

prove sleep quality over time as problems are resolved. Regarding overall health perceptions (Deselms, 2016) and health behaviors (e.g., healthy food choices; Cropley et al., 2012), problem-solving pondering shows no significant effects, possibly because the problem-solving thought process is relatively neutral (Weinberger et al., 2018) and thus fails to demonstrate positive effects in the short term. In fact, when individuals ruminate on positive work experiences, they report fewer physical and psychological complaints in the evening and maintain blood pressure less susceptible to work-family conflict (Bono, Glomb, Shen, Kim, & Koch, 2013). Rumination on positive work experiences can also reduce after-work drinking behavior and decrease heavy drinking incidence (Frone, 2015).

The relationship between problem-solving pondering and well-being has also yielded inconsistent conclusions. Querstret and Cropley (2012) found that problem-solving pondering significantly negatively correlated with both chronic and acute fatigue on workdays. Other studies show that problem-solving pondering bears no significant relationship with concurrent emotional exhaustion (Deselms, 2016; Vandevala et al., 2017) or depressive experiences (Vandevala et al., 2017), possibly due to similar special characteristics in the study populations. Both studies had effective sample sizes below 100, with Deselms (2016) examining 911 emergency dispatchers and Vandevala et al. (2017) studying ICU medical staff. These occupations share features of urgency and uncertainty, creating strong emotional impacts that leave employees frequently experiencing intense emotions and thus more susceptible to work-related affective rumination. Similar to Querstret and Cropley (2012), for employees across various occupations, problem-solving pondering shows significant negative cross-sectional correlations with exhaustion but fails to significantly predict exhaustion levels six months to one year later (Firoozabadi et al., 2018). These results suggest that the relationship between problem-solving pondering and well-being variables may be moderated by factors such as occupation type and measurement timing.

In the work domain, problem-solving pondering demonstrates more significant positive effects. A diary study of entrepreneurs found that problem-solving pondering the previous evening significantly positively predicted their work creativity the following day (Weinberger et al., 2018). Moreover, the positive effects of problem-solving pondering on work variables show strong cross-temporal stability, significantly predicting work creativity one year later (Vahle-Hinz et al., 2017) and even work engagement levels two years later (Kinnunen et al., 2017). WRR with more positive content valence also shows stable cross-temporal promoting effects on employee work proactivity, organizational citizenship behavior (Binnewies et al., 2009), and work engagement (Flaxman et al., 2018).

In summary, the significant positive effects of work-related problem-solving pondering primarily manifest in the work domain, while its effects on health and well-being remain unstable. This may occur because the problem-solving thought process is rational and content-neutral, failing to elicit strong physiological arousal and thus showing limited short-term effects on health and emotions.

When WRR content carries more positive valence, individuals' work lives experience more significant positive impacts, or problem-solving pondering may promote health and well-being through the positive experiences resulting from problem resolution. Additionally, boundary conditions such as occupation type may contribute to the unstable manifestation of problem-solving pondering's positive effects.

2.2 Negative Effects of Work-Related Rumination

The negative effects of WRR primarily manifest in the impact of work-related affective rumination on employee health, well-being, and work performance. Extensive research demonstrates that work-related affective rumination correlates with poor sleep quality (e.g., Berset, Elfering, Stefan Lüthy, Simon Lüthi, & Semmer, 2011; Vahle-Hinz et al., 2014; Kinnunen et al., 2017). Affective rumination mediates the relationship between work stressors such as time pressure (Berset et al., 2011; Kinnunen et al., 2017), task pressure (Syrek & Antoni, 2014; Syrek et al., 2017), and workplace incivility (Demsky et al., 2019; Yuan et al., 2018) and insomnia. It also serves as the internal mechanism through which certain personality traits (e.g., perfectionistic worry; Flaxman et al., 2018) negatively affect sleep. Furthermore, because affective rumination maintains individuals at elevated psychophysiological arousal levels, it causes fluctuations in physiological indicators (Vahle-Hinz et al., 2014; Cropley, Rydstedt, Devereux, & Middleton, 2015). For instance, compared to low affective rumination groups, high affective rumination groups show lower heart rate variability regulated by the vagus nerve, indicating lower parasympathetic activity and thus greater vulnerability to autonomic nervous system imbalance that impairs physiological health (Cropley et al., 2017). Regarding health experiences and behaviors, affective rumination significantly negatively predicts recovery levels one year later (Vahle-Hinz et al., 2017) and recovery value (Van Laethem et al., 2018). Individuals high in affective rumination report more unhealthy eating behaviors (Cropley et al., 2012) and greater workday drinking, heavy drinking, and after-work drinking behaviors (Frone, 2015).

The detrimental effects of WRR on well-being-related variables have been extensively confirmed through cross-sectional and longitudinal studies. Individuals with high affective rumination experience greater emotional exhaustion (Bono et al., 2013; Baranik, Wang, Gong, & Shi, 2014; Deselms, 2016; Flaxman et al., 2018), higher fatigue levels (Querstret & Cropley, 2012; Deselms, 2016), more depressive symptoms (Wang et al., 2013; Vandevala et al., 2017), and lower subjective well-being (Flaxman et al., 2012; Locatelli et al., 2012). Moreover, the negative effects of affective rumination on well-being have been consistently validated across different timeframes of 3, 6, and 12 months (Firoozabadi et al., 2018).

In the work domain, affective rumination negatively predicts work engagement (Kinnunen et al., 2017) and work creativity (Vahle-Hinz et al., 2017) two years later, and positively predicts work exhaustion after one year (Kinnunen, Feldt,

& de Bloom, 2019) and two years (Kinnunen et al., 2017). However, research has not yielded consistent negative effects of work-related affective rumination on work performance. For example, some studies show that affective rumination significantly negatively correlates with job performance (Van Laethem et al., 2018), whereas Binnewies et al. (2009) failed to find a significant relationship between negative work rumination and job performance in their early research.

Overall, work-related affective rumination demonstrates relatively significant negative predictive effects on individual work life, remaining stable for up to two years. Precisely because of its lasting detrimental impact, an increasing number of scholars have begun focusing on pathways to reduce or moderate the negative effects of WRR.

3 Theoretical Foundations of the Double-Edged Sword Effect

Three theories can explain the internal mechanisms through which the two dimensions of WRR produce positive and negative effects.

3.1 Explanation Based on Perseverative Cognition Theory

Perseverative cognition encompasses various processes including worry, rumination, and anticipatory stress, all sharing the essential feature of recurrence. Perseverative cognition theory posits that stressors directly trigger immediate psychophysiological arousal, but persistent psychophysiological activation causes chronic disease. Due to perseverative cognition, the perception of stressors as uncontrollable repeatedly emerges, prolonging the psychophysiological activation caused by stressors and ultimately leading to persistent negative emotional experiences and impaired organ function (Brosschot, Gerin, & Thayer, 2006). During work-related affective rumination, individuals perceive work as an uncontrollable, unavoidable stressor (Pravettoni et al., 2007) and experience negative emotions such as depression and anxiety. During work-related problem-solving pondering, individuals aim to solve work-related difficulties or promote work development (Cropley & Zijlstra, 2011), meaning work is not represented as an uncontrollable stressor. According to perseverative cognition theory, the uncontrollable stress perception of work repeatedly emerges during affective rumination, prolonging physiological activation and emotional responses initiated by stress perception. During problem-solving pondering, although individuals continuously think about work content, they do not represent work as uncontrollable, thus preventing prolonged physiological activation. Querstret and Cropley (2012) also note that the crucial distinction between affective rumination and problem-solving pondering lies in the higher psychophysiological arousal during affective rumination, which impairs recovery, whereas problem-solving pondering involves no persistent psychophysiological arousal and thus causes minimal recovery disruption. In summary, perseverative cognition theory can explain why affective rumination mediates the relationship between work stress and

health outcomes, whereas problem-solving pondering' s mediating effects are generally non-significant. For example, Syrek et al. (2017) examined the mediating role of WRR dimensions between unfinished tasks and sleep problems, confirming that only work-related affective rumination mediated this relationship. Similarly, Vandevala et al. (2017) found that only work-related affective rumination mediated relationships between work stressors and exhaustion, depression, and mental illness risk.

3.2 Explanation Based on Cognitive Activation Theory of Stress

Cognitive activation theory of stress (Ursin & Eriksen, 2004; Meurs & Perrewé, 2011) represents an integrative stress theory arguing that traditional equilibrium models (e.g., Conservation of Resources Theory, Effort-Reward Imbalance Model, Job Demands-Control Model) only consider negative stress outcomes while neglecting the adaptive or functional aspects of stress experiences. This theory proposes that brief stress itself is not the critical factor affecting individuals; rather, individuals' cognitive appraisal of stress determines outcome expectancies, which in turn determine results. Outcome expectancies refer to individuals' evaluations of the results of their responses to stressful situations, divided into three types: negative expectancy, positive expectancy, and no expectancy. Positive outcome expectancy occurs when individuals believe their coping behaviors can influence outcomes in a positive manner. Negative outcome expectancy emerges when individuals believe they cannot control or influence stress outcomes, or that their responses will produce negative results. Negative outcome expectancy leads to persistent psychophysiological arousal. During work-related affective rumination, individuals perceive work problems as uncontrollable and unavoidable (Pravettoni et al., 2007), leading to negative outcome expectancies whose repeated emergence ultimately prolongs psychophysiological activation. During problem-solving pondering, individuals believe they can control situations by completing tasks and finding goal-achievement methods (Michalianou, 2011), generating positive outcome expectancies. Finding solutions and experiencing control are effective ways to reduce arousal, so problem-solving pondering involves no prolonged psychophysiological activation. This similarly helps explain why affective rumination mediates the relationship between work stressors and health impairment, whereas problem-solving pondering shows no significant mediating effect. Firoozabadi, Uitdewilligen, and Zijlstra (2018) tested this theory through three measurements over one year, finding that under equivalent work stress levels, affective rumination significantly predicted increases in emotional exhaustion over 12 months, whereas problem-solving pondering did not significantly predict changes in exhaustion over time. The authors concluded that these results support cognitive activation theory' s view that negative outcome expectancies generated by affective rumination prolong psychophysiological activation, thereby impairing well-being, whereas positive outcome expectancies from problem-solving pondering do not prolong activation and thus have no significant effect on well-being.

3.3 Explanation Based on Cognitive Resource Perspective Theory

Cognitive resource perspective theory encompasses a group of theories including limited resource theory (Kahneman & Treisman, 1984) and resource allocation theory (Connolly et al., 2014), with limited resource theory as its core. Also known as single central capacity theory (Kahneman & Treisman, 1984), limited resource theory posits that human cognitive resources are finite, requiring controlled allocation of limited resources across different activities or different aspects of the same activity. Persistent rumination continuously occupies cognitive resources, thereby impairing resources allocated to other tasks (Connolly et al., 2014). During work-related affective rumination, cognitive resources are continuously consumed by negative work experiences and emotional processes, and because this impedes recovery processes such as sleep, resources cannot be effectively restored, consequently impairing work role performance (Weinberger et al., 2018). Although problem-solving pondering also consumes cognitive resources (Cropley & Zijlstra, 2011; Firoozabadi et al., 2018), this process involves problem redefinition and exploration, enabling learning from problem-solving attempts that can be considered a form of resource restoration (Seo, Barrett, & Bartunek, 2004; Firoozabadi et al., 2018). Moreover, problem-solving pondering causes minimal damage to recovery processes like sleep, facilitating the restoration of depleted resources. Thus, cognitive resource perspective theory can explain the differential effects of WRR on work performance. Existing research confirms this view: Bennett et al. (2016) found that work-related problem-solving pondering contributes to mastery experiences. For entrepreneurs who use problem-solving pondering as a resource rebuilding strategy during non-work time, problem-solving pondering significantly positively predicted their work creativity the following day (Weinberger et al., 2018).

In summary, perseverative cognition theory and cognitive activation theory of stress primarily explain WRR's effects from the perspective of whether it induces prolonged psychophysiological activation. Their explanatory mechanisms are relatively similar, differing mainly in the source of psychophysiological activation—the former attributes activation to cognitive appraisal of work controllability, while the latter attributes activation to outcome expectancies of coping with work stress. Currently, more studies have applied perseverative cognition theory. Cognitive resource perspective theory explains WRR's effects from the angle of differential resource consumption during rumination. These theories all possess explanatory power for the “double-edged sword” effects of WRR on individual health, well-being, and work role performance.

4 Future Research Directions

Although WRR research is increasing and has yielded valuable findings providing an important foundation for understanding its effects, many significant questions regarding WRR require further comprehensive and in-depth investigation.

4.1 Exploring Boundary Conditions Influencing WRR' s Subsequent Effects

Inconsistent conclusions regarding certain effects of WRR in previous research may result from boundary conditions. Analysis of depressive rumination found that women ruminate more about negative experiences than men (Nolen-Hoeksema, Larson, & Grayson, 1999), and men generally exhibit higher rational thinking levels than women (张之沧, 2013). Therefore, negative effects of WRR may show gender differences. Second, occupation type may also influence WRR' s effects. Research shows that workers in creative occupations engage in more problem-solving rumination, whereas those in repetitive occupations engage in more affective rumination (Pravettoni et al., 2007), and technical employees report more WRR than non-technical employees (Cropley & Zijlstra, 2011). This evidence suggests that the manifestation of WRR' s positive or negative effects may be moderated by occupation type. Additionally, employees' job level may influence WRR' s subsequent effects, as research indicates that problem-solving pondering more easily demonstrates significant positive effects among leadership levels with higher decision-making autonomy (Weinberger et al., 2018).

4.2 Analyzing Psychological Mechanisms of WRR' s Double-Edged Sword Effect on Work Role Performance from a Cognitive Function Perspective

Existing theories primarily explain WRR' s effects from psychophysiological activation and resource depletion perspectives. The former is more applicable for explaining WRR' s direct effects on health and well-being but may lack direct explanatory power for how post-work WRR affects next-day work performance. The latter can explain WRR' s effects on work role performance but may require simultaneously considering both resource depletion and recovery, making the process somewhat complex. Cropley et al. (2016) used questionnaire methods to analyze relationships between WRR and executive function, finding that work-related affective rumination negatively correlated with executive function, manifesting as higher cognitive failure levels, lower cognitive flexibility, and lower work context perception among high ruminators. During affective rumination, individuals experience negative emotions, and negative affect impairs executive function (周雅, 2013). During problem-solving pondering, individuals' continuous exploration of multiple solution approaches may enhance cognitive flexibility. High-level executive function represents an important guarantee for individuals to complete tasks excellently and improve work performance (邢强, 孙海龙, 占丹玲, 胡婧, 刘凯, 2017). Therefore, executive function likely represents a core internal mechanism through which WRR affects work performance. Future research should systematically analyze this relationship, thereby enabling interventions targeting executive function to reduce WRR' s negative impacts.

4.3 Exploring Effective Approaches to Promote Problem-Solving Pondering While Reducing Affective Rumination

WRR constitutes state rumination that fluctuates between the two types based on work experiences, meaning individuals may alternately experience both forms of WRR within a period. A person-centered longitudinal study confirmed that over 70% of employees experienced both work-related affective rumination and problem-solving pondering during a two-year period (Kinnunen et al., 2017). This indicates that the “double-edged sword effect” of WRR represents a common experience among the general population. This suggests that future research could examine how to reduce WRR’s negative effects by promoting employees’ focus on problem-solving rather than emotional experiences. For example, enhancing employees’ problem-solving skills (Firoozabadi et al., 2018) may increase their confidence in meeting high job demands, thereby preventing negative emotions when thinking about work after hours and enabling more rational problem analysis and solution seeking. Training employees to use narrative approaches (focusing on behaviors and events themselves) when writing pen-and-paper diaries could also promote cognitive reconstruction of work events and help control negative rumination (Yukawa, 2008). Simultaneously, research perspectives should expand from variable-centered to person-centered approaches, focusing on individual differences and implementing targeted interventions for employees whose WRR is predominantly affective rumination.

4.4 Analyzing WRR’s Effects on Spouses and Important Family Members Based on Spillover-Crossover Effects

Previous research on WRR’s effects has primarily focused on the individual level, with limited attention to whether and how WRR affects employees’ significant others. According to the spillover-crossover effects model, individuals’ work-related experiences can spill over into the family domain and cross over to affect spouses and other important others through social interaction (马红宇, 谢菊兰, 唐汉瑛, 申传刚, 张晓翔, 2016). WRR primarily occurs in the family domain and occupies individuals’ leisure time, representing spillover from work experiences to family. Future research should investigate whether this spillover effect crosses over to affect spouses’ or children’s sleep and well-being, consequently affecting marital and parent-child relationships. Examining WRR’s subsequent effects at the couple and family levels will contribute to more comprehensive understanding of WRR’s impact on individual work and life.

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