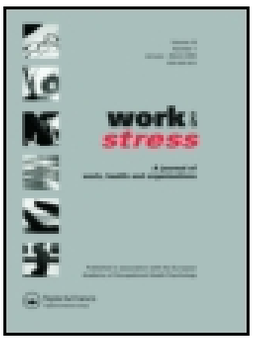

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Work-related episodic memories can increase or decrease motivation and psychological health at work

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ABSTRACT

Research on the psychological mechanisms underlying employee motivation and psychological health at work has been limited to general and chronic workplace factors, such as job strenuousness or management style. In two studies, we examine how unique and time-specific work life events encoded as episodic memories can influence employee motivation and psychological health at work as a function of how these events are recalled having been experienced in terms of need satisfaction. In Study 1, participants described a self-defining work-related memory and rated it for need satisfaction. They also completed scales of need satisfaction at work, self-determined motivation, and positive and negative indicators of psychological health (i.e. work satisfaction and burnout). In Study 2, participants completed the same tasks and scales, but they did it again two years later. Results revealed that need satisfaction in self-defining work-related memories was associated with self-determined motivation and indicators of psychological health at work, over and above demographics (age, sex, weekly hours worked, education) and general perceptions of need satisfaction at work. Moreover, it predicted increases in self-determined motivation and in work satisfaction and decreases in burnout over two years. The present findings underscore the importance of considering unique work life events encoded in memory.

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Episodic memory; need satisfaction; work; psychological health; motivation

Researchers and managers alike have generally recognised that impaired psychological health at work, such as work dissatisfaction or burnout, can affect both workers and organisations in negative ways. Workers characterised by poor psychological health are often less productive (Demerouti, Bakker, & Leiter, 2014; Stewart, Ricci, Chee, Hahn, & Morganstein, 2003), show increased absenteeism (Darr & Johns, 2008; Ybema, Smulders, & Bongers, 2010), and make lower overall contributions to the organisation (Taris, 2006). These economic and health consequences also have high societal cost (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015). It is therefore essential to gain a deeper understanding of employee psychological health at work (Schaufeli & Taris, 2014). More specifically, the mechanisms influencing employee psychological health are still debated and not fully explored. There is a large and extensive literature on chronic work environmental

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factors (e.g. job stressors) that can affect employee psychological health at work (e.g. Ganster & Perrewé, 2011; Schaufeli & Taris, 2014). However, less attention has been paid to how specific and non-repeated job events may affect employees, beyond those chronic job factors (Beehr, Jex, Stacy, & Murray, 2000). The present research uses a memory perspective embedded within the framework of self-determination theory to approach this issue. Episodic memories represent specific life episodes that have been encoded with strong motivational properties and which have been found to play a significant role in psychological health (Philippe, Koestner, Beaulieu-Pelletier, Lecours, & Lekes, 2012). As such, work-related episodic memories may represent an important psychological mechanism, though an overlooked one, accounting for employee motivation and psychological health at work.

Self-determination theory (SDT)

One influential theory that accounts for the psychological mechanisms operating on workers' psychological health is SDT (Deci, Olafsen, & Ryan, 2017; Gagné & Deci, 2005). This theory specifies that psychological needs for autonomy, competence, and relatedness must be satisfied at work for workers to be optimally motivated and to thrive. Autonomy is defined as the need to feel volitional and authentic in one's actions; Competence reflects the need to feel effective and efficacious; Relatedness refers to the need to feel connected and cared for by others and to care for others in turn (Deci & Ryan, 2000). In the work context, satisfaction of these needs is posited to facilitate self-determined motivation at work (also called autonomous motivation), which means that employees work because they enjoy their job, because their job corresponds to their values and identity, or because they freely choose their job as important for themselves. Conversely, thwarting of those psychological needs at work leads to a non-self-determined motivation (also called controlled motivation), that is, engaging in one's job out of feelings of guilt, pressure, or to gain external rewards (e.g. cash bonuses, pleasing the boss) and avoid punishments (e.g. avoid disapprobation, being fired). Satisfaction of these psychological needs is also expected to sustain workers' psychological health, as expressed by higher work satisfaction and lower burnout. This theory is also in line with other models seeking to explain modulations in employee psychological health, such as job strain (i.e. high demands and low resources, such as autonomy, Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) and effort-reward imbalance (i.e. low competence and relatedness, Siegrist, Siegrist, & Weber, 1986).

Empirical support for SDT is large and supportive of its claims (for a recent review see Ryan & Deci, 2017). From a general standpoint, satisfaction of the needs for autonomy, competence, and relatedness have been found to be strongly associated with well-being across 128 nations of the world (e.g. Tay & Diener, 2011). In the work context, satisfaction of psychological needs has frequently been shown to be associated with or to lead to self-determined motivation at work (e.g. Arshadi, 2010; De Cooman, Stynen, Van den Broeck, Sels, & De Witte, 2013) and to be associated with or to predict increases in employee psychological health over time (e.g. Baard, Deci, & Ryan, 2004; Fernet, Austin, Trépanier, & Dussault, 2013; Trépanier, Fernet, & Austin, 2015). In a recent meta-analysis of 99 studies in the organisational domain, Van den Broeck, Ferris, Chang, and Rosen (2016) have shown that satisfaction of each of the three needs is associated with self-determined

motivation at work (explaining more than 42% of its variance) and with various indicators of psychological health at work, such as strain, job satisfaction, affective commitment, and burnout (explaining between 15% and 46% of their variance).

SDT has also identified certain workplace factors that can affect employees' perceptions of need satisfaction and motivation at work. The theory proposes that the work environment, work climate, organisational rules, structures and policies, management style, and relationships with colleagues may sustain or undermine people's psychological needs (Gagné & Deci, 2005; Gillet, Fouquereau, Forest, Brunault, & Colombat, 2012). One important factor in this framework is autonomy support. Work contexts that are autonomy supportive provide a good rationale for tasks and requests, provide employees with choice and opportunities, acknowledge their feelings, and convey confidence in the employees' abilities within a climate of relatedness (Williams, Gagné, Ryan, & Deci, 2002). For instance, Baard et al. (2004) have shown that perceived autonomy support provided by the manager facilitated psychological need satisfaction, which in turn led to a better performance and greater psychological health (less anxiety, somatisation, and more vitality). Various other studies have shown similar results (Deci et al., 2001; Gagné, Koestner, & Zuckerman, 2000; Gillet et al., 2012; Ilardi, Leone, Kasser, & Ryan, 1993). Additional related environmental factors have been found to affect people's psychological needs such as job demands and resources (Bakker & Demerouti, 2007; Demerouti, Bakker, de Jonge, Janssen, & Schaufeli, 2001). Several studies have shown that job demands such as role overload and role ambiguity lead to burnout through unmet psychological needs, whereas job resources such as job control and social support facilitate the satisfaction of psychological needs, which in turn lower burnout (De Cooman et al., 2013; Fernet et al., 2013; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008).

Memories as time-specific work events

In sum, most studies on SDT have focused on how work environment factors such as autonomy support or job demands and resources can alter need satisfaction, motivation, and psychological health at work. These are general, enduring, and chronic environmental factors related to one's job, which affect important work outcomes over time. However, certain specific, non-repeated, life events that occurred at work, at a specific time and place, may also impact employee's motivation and psychological health over time. Consider the following situation: A supervisor acts in a controlling manner with an employee by heavily criticising this employee's performance on a certain task. Even if this supervisor is not perceived as generally displaying a controlling management style or the job to be strenuous, this experience will lead to the creation of a memory of this life episode in the employee's memory system. Many of these memories will be quickly forgotten or the person will lose access to them (Conway, 2009). However, a certain number of such memories can become heavily linked to one's goals (Conway, Singer, & Tagini, 2004), thereby becoming chronically accessible and frequently accessed (Higgins, Rholes, & Jones, 1977), and start playing an influential role in the employee's life (Philippe et al., 2012). Such memories are called self-defining memories (Singer & Salovey, 1993). These memories will reach this status if they convey a certain meaning and direction to one's personal long-term goals or if they inform of potential obstacles to their attainment (Conway et al., 2004). They then represent the dominant themes and concerns in a

person's life and consequently are thought to anchor identity aspects (Blagov & Singer, 2004; Conway et al., 2004). Going back to the example used above, if the employee had the goal of obtaining a promotion, the specific memory of being harshly criticised by his supervisor will now inform of a substantial obstacle toward the attainment of this goal.

Because of their central role in a certain life area, these memories are repeatedly activated or accessed, either by the context, action, or goal to which they relate (Conway & Pleydell-Pearce, 2000). For example, thinking of the promotion or finding himself in the same room in which the discussion with the supervisor occurred, could reactivate the supervisor-memory of this employee. Over time, these frequent reactivations influence motivational orientations and psychological health outcomes (Philippe et al., 2012). Moreover, they are likely to operate independently of chronic job factors. The memory of being criticised by one's supervisor may reorient motivation toward non-self-determined actions such as trying to please the supervisor, feeling ashamed of not working hard enough, or – if one perceives that his actions are ineffective – a loss of motivation for work, regardless of how the supervisor is generally perceived or of how strenuous is the job. In addition, frequent reactivations of a need thwarting work-related memory is likely to lead to a subjective sense of ill-being, thereby reducing work satisfaction and potentially increase burnout over time. As such, these memories, through their frequent reactivations, start having directive and cumulative effects of their own on workers' motivation and psychological health at work. Research has also shown that these effects of memory reactivations can occur through both conscious retrieval (e.g. Kuwabara & Pillemer, 2010) and unconscious activation (e.g. Philippe & Bernard-Desrosiers, 2017; Philippe et al., 2012).

These memories do not remain active forever. In fact, once the goal to which they are related is achieved or is changed or once the concern is resolved, these memories are either forgotten (access is lost) or their vividness and significance are considerably decreased and new self-defining memories, more in line with the person's new goals and concerns are elected from the person's memory system (Conway, 2009; Conway & Pleydell-Pearce, 2000). However, during the time self-defining memories are active, they can influence a wide range of outcomes in the person's life.

In line with SDT (Ryan & Deci, 2017), research has shown that one fundamental component of self-defining memories is the level to which people experienced need satisfaction during the event of the memory (Philippe, Koestner, Beaulieu-Pelletier, & Lecours, 2011). Research has shown that the level of need satisfaction attached to a memory can influence important life outcomes, situationally and longitudinally. Philippe and colleagues (Philippe & Bernard-Desrosiers, 2017; Philippe et al., 2012) have shown that when a need satisfying memory was primed outside of people's awareness it led to an immediate increase in situational well-being, whereas when a need thwarting memory was primed, a decrease in situational well-being was observed. Longitudinally, need satisfaction in self-defining memories was found to increase well-being over periods of two months (Houle & Philippe, 2017; Milyavskaya, Philippe, & Koestner, 2013) to almost two years (Philippe et al., 2012) and need satisfaction in self-defining couple-related memories was found to predict increases in relationship quality and to decrease the likelihood of breakup over two years (Philippe, Koestner, & Lekes, 2013). Those results were obtained even after controlling for self-perceptions of need satisfaction in general or in a specific domain. This is because the effect of self-defining memories is transient (lasting months or years) and

has not yet translated into general and stable self-perceptions. Therefore, the effect of memories has constantly been found to predict outcomes over and above general level measures such as traits, attitudes, or general self-perceptions (e.g. Adler, Lodi-Smith, Philippe, & Houle, 2016; Kuwabara & Pillemer, 2010; Philippe et al., 2012, 2013).

The present research

In the present research, we sought to examine self-defining work memories and investigate whether need satisfaction in these memories could predict changes in motivation and psychological health at work. Given that we did not have specific hypotheses about one need in particular, we assessed all needs together as per past memory research (e.g. Philippe et al., 2012). Work satisfaction and burnout were chosen as positive and negative indicators of employee psychological health because satisfaction with one's job and mental strain have traditionally been part of the definition of employee psychological health (Danna & Griffin, 1999) or of related concepts (e.g. working life quality: Hoppock, 1935; Lawler, 1982). Work satisfaction and burnout have also been consistently related to employees' motivational resources (Van den Broeck et al., 2016) as well as to substantial individual and organisational costs (Demerouti et al., 2014; Halbesleben & Bowler, 2007; Riketta, 2008). Work satisfaction refers to the employees' attitudes toward the job, the relevant environment, and their overall emotional response to their job roles (Diener, 2000). Burnout reflects an affective strain reaction to ongoing stress (Maslach, 1982) whose core content is emotional exhaustion (Halbesleben & Bowler, 2007). Study 1 examined cross-sectionally whether need satisfaction in work-related memories was associated with self-determined motivation, work satisfaction, and burnout. Study 2 examined longitudinally whether need satisfaction in work-related memories could predict increases in work motivation and satisfaction and decreases in burnout over two years.

STUDY 1

The purpose of Study 1 was to investigate the cross-sectional associations existing between need satisfaction in work-related memories and work self-determined motivation and psychological health. Significant work-related memories that people can remember spontaneously are expected to be chronically accessible and therefore to be frequently activated by one's work environment or context (Philippe et al., 2013; Singer & Salovey, 1993). Following their frequent activations, need satisfying memories are expected to sustain self-determined motivation and psychological health at work, whereas need thwarting memories are likely to decrease self-determined motivation and psychological health. Given the cross-sectional nature of Study 1, only a snapshot of this process is taken within time. It was hypothesised that need satisfaction in work-related memories would be positively associated with self-determined motivation and work satisfaction and negatively associated with burnout. To ensure that need satisfaction in work-related memories was not redundant with a general measure of need satisfaction at work, we controlled for such a measure in the analyses. Research has shown that the effect of distinct memories is not redundant, but additive (see Philippe et al., 2012). Therefore, the effect size in the present study was expected to be small given that only one work-related memory was

assessed. The purpose of the present research was to show that work-related memories significantly impact motivation and psychological health and therefore only one memory was assessed to keep the questionnaire short. Philippe et al. (2012) reported R^2 increase between .027 and .054 for need satisfaction in self-defining memories on self- and peers-rated well-being, respectively, after accounting for demographics, traits, general need satisfaction, and psychological symptoms. Power analysis based on the average of these effect sizes ($R^2 = .041$) revealed that, for a power of .80 at an alpha of .05, 196 participants were needed to detect a significant effect of need satisfaction in work-related memories on motivation and psychological health markers within multiple regressions.

Method

Participants and procedure

A total of 220 employees (69% female) with at least one year of experience at their current job were recruited from various cegeps (similar to American colleges) in the Province of Quebec (Canada). Types of employee included administrative support staff (35.9%), professionals (20%), teachers (36.8%), and executives (7.3%). They were aged 42.26 years on average ($SD = 11.11$), worked on average 36.32 hours per week ($SD = 7.06$), and had 13.52 years of experience in their current job ($SD = 9.28$). They were contacted by email by their institution and invited to take part in an online study on quality of work life. They completed measures of work satisfaction, burnout, self-determined motivation, and need satisfaction at work and then reported a work-related memory and rated it for need satisfaction.[1]

Work-related memory. Participants were asked to describe in detail a memory related to their choice, orientation, or reorientation of career or a significant memory related to their work. Memories related to the choice or orientation of career were suggested because, in line with research on self-defining memories, such first-time events often make good candidates of self-defining memories (Conway et al., 2004; see also Pillemer, 2001). The chosen memory had to be at least three months old to ensure that the memory was not recalled because of a recency effect, thereby increasing the likelihood that the memory was significant and important for the participants. The following instructions derived from past research (Philippe et al., 2011; Singer & Salovey, 1993; Sutin & Robins, 2005) were used:

> Please describe a personal memory of a specific event related to your choice, orientation, or reorientation of career and which was significant for you. If you do not have an important memory related to your career choice, describe a significant memory related to your work. Select a memory that is at least three months old and that often comes to your mind. This memory can be either positive, negative, or both. Do not take too much time to find the perfect memory. Just choose the one that spontaneously comes to your mind. Describe in a general fashion what happened, where it happened, who you were with (if anyone), and how you and other people reacted. Describe your role and what have been the consequences of your reaction or of your actions during this event, if it applies. Please provide enough details so that we can fully understand what happened, as if you were telling a story to someone.

Next, participants were asked to rate the level of need satisfaction they experienced during the event of this memory. Three items were used to assess each of the three needs: "I felt

free to do things and to think how I wanted" (autonomy), "I felt competent or capable" (competence), and "I felt connected to one or more people" (relatedness). An index representing need satisfaction in the work-related memory was computed by averaging all item scores. Cronbach's alpha coefficient for this index was .77. Past research (Philippe et al., 2011, Study 1) has shown a large correlation ($r = .70$) between need satisfaction in memory descriptions as rated by the participants themselves and as coded by independent judges.

Here is an excerpt of a need satisfying memory description from a 35-year-old professional of an event that occurred one year ago:

> At the time of my first evaluation, the executive of the service has highlighted my strengths and my value for the organization. I felt valued and it has increased my feeling of relatedness and of being important for the organization, something that I really appreciate. This has provided me with an increase motivation to continue to do my work efficiently while being more and more involved in the work processes of the organization.

This memory underscores how one specific event which meets the needs of autonomy, competence, and relatedness can have a large and influential role on workers' motivation and psychological health. If this memory is chronically accessible and is therefore frequently activated, such a memory can serve as a motivational resource, which will continue to build further motivation and facilitate psychological health at work. Memories can also have the opposite effect, as exemplified by the following excerpt of a need thwarting memory from a 44-year-old manager of an event that occurred seven years ago:

> I have been falsely accused of psychological harassment by an employee that I was supervising. The complaint has been rejected and the employee has been transferred to another service. Nevertheless, following this event and following how it had been managed by my previous employer, I have lost confidence and I have changed job and chosen a totally different work environment. Since this complaint, even if I work in a radically different context, I still have doubts about the choice that I made more than 10 years ago to become a manager.

This need thwarting memory illustrates well how a particular work event, even if it occurred several years ago, can have a dramatic effect over an employee's motivation, psychological health, and even professional identity over time and that such effects are pervasive even across working areas. For this person, it is as if the fear of being perceived as a harasser again has become associated with the action of managing other employees. Any similar action is likely to reactivate this memory (probably mostly unconsciously), which further hinders this person's motivation and psychological functioning at work over time.

A thematic analysis of the reported memories revealed that 29% focused on achievement or accomplishment of something personally important (e.g. promotion, acknowledgment of one's competence), 21% related events of career reorientation or of finding one's way, 14% described episodes of getting fired, demoted, or losing one's motivation, 12% related interpersonal conflict (e.g. harassment, unfair treatment), 11% were about being hired from a job, 8% conveyed events during which the protagonist had a clear insight about his/her work, and 5% were classified as other (e.g. refusing another job). Overall, 26% of the memories were rated as need thwarting as opposed to 74% which were need satisfying. Similar proportions were found in other studies using self-defining memories (e.g. Philippe et al., 2011).[2]

Work need satisfaction. The 18-item Work-Related Basic Need Satisfaction Scale (Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010) was used to measure the three psychological needs of autonomy, competence, and relatedness as experienced at work in general. A sample item assessing relatedness is "At work, I feel part of a group." An item measuring competence is "I really master my tasks at my job," and an item tapping into autonomy is "The tasks I have to do at work are in line with what I really want to do." These items measure perception of need satisfaction at work in general and are distinct from the assessment of need satisfaction in a specific work episode as explained in the work-related memory measure presented above. Replicating past research (Van den Broeck et al., 2010), a confirmatory factor analysis with Robust Maximum Likelihood on the present study data revealed adequate fit indices for a three-factor structure $\chi^2(132) = 246.27$, RMSEA = .044 [.036; .053], CFI = .946. TLI = .936, SRMR = .054 and factor loadings ranging from .42 to .87. Fit indices were also adequate for a second-order combining all three first-order factors, $\chi^2(133) = 254.35$, RMSEA = .045 [.037; .054], CFI = .942. TLI = .933, SRMR = .054. An index averaging all three needs at work was therefore computed, as it is commonly done by self-determination theory researchers (e.g. Taylor, Lekes, Gagnon, Kwan, & Koestner, 2012). Cronbach's alpha coefficient for this index was .85.

Self-determined motivation at work. The Work Extrinsic and Intrinsic Motivation Scale (WEIMS: Tremblay, Blanchard, Taylor, Pelletier, & Villeneuve, 2009) was used to measure self-determined motivation at work. This scale assesses six forms of motivation with three items each, along a continuum of self-determination: intrinsic motivation (e.g. "I do this work … because I derive much pleasure from learning new things"), integrated motivation (e.g. " … because it has become a fundamental part of who I am"), identified regulation (e.g. " … because I chose this type of work to attain my career goals"), introjected regulation (e.g. " … because I want to be a winner in life"), external regulation (e.g. " … for the income it provides me"), and amotivation (e.g. "I don't know, too much is expected of us"). Cronbach's alpha coefficients of each subscale were all > .70. In line with the theoretical continuum of self-determination (Howard, Gagné, & Bureau, 2017) and what has been commonly done by self-determination researchers (Ryan & Deci, 2017; Sheldon, Osin, Gordeeva, Suchkov, & Sychev, 2017), a weighting procedure was applied to the scale as followed: (intrinsic × 3) + (integrated × 2) + (identified × 1)−(introjected × 1)−(external × 2)−(amotivation × 3). Results were exactly the same using an unweighted index in both Studies 1 and 2.

Work satisfaction. The adapted version for work (Bérubé, Donia, Gagné, Houlfort, & Lvina, 2016) of the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) was used to measure work satisfaction with five items. Sample item included "In general, my work closely corresponds to my ideals". Cronbach's alpha coefficient was .84 in the present study.

Burnout. The Maslach Burnout Inventory (BMI; Maslach, Jackson, & Leiter, 1996) was used to measure burnout. In this study, the 8-item emotional exhaustion subscale was used, as it is generally considered the hallmark of burnout (e.g. Halbesleben & Bowler, 2007; Piko, 2006). A sample item is "I feel emotionally drained from my work". Cronbach's alpha coefficient in this study was .90.

Results

Table 1 reports means, standard deviations, and correlations among Study 1 variables.

Preliminary analyses revealed that age and years of experience were highly correlated (r = .73) and that age was a better predictor of the examined outcomes than years of experience. Age was therefore kept in the main analyses. Categories of employment (executives, administrative staff, professionals, and teachers) were also highly related to levels of education, $F(3, 216) = 76.25$, $\eta^2 = .51$. Executives, professionals, and teachers did not differ against each other, but all had higher levels of education than the administrative support staff (all ts > 5.80). Education was also a better predictor of the examined outcomes than categories of employment and was therefore included in the analyses.

The main objective of Study 1 was to examine whether need satisfaction in work-related memories would be associated with self-determined motivation and indicators of psychological health at work, above and beyond the effect of work need satisfaction. To ensure that the effects were not only due to self-determined motivation, we also controlled for this variable in the analyses examining psychological health. Multiple regression analyses were conducted with age, sex, weekly hours of work, and education as control variables. There were all entered at Step 1, along with work need satisfaction and self-determined motivation when appropriate. Need satisfaction in the work-related memory was entered at Step 2.

A first hierarchical regression analysis was conducted with self-determined motivation at work as the dependent variable (see Table 1 for detailed results). At Step 1, sex (female = 0; male = 1) was negatively associated with self-determined motivation, whereas education and work need satisfaction were significantly and positively associated with it, both explaining 28% of the variance. At Step 2, need satisfaction in the work-related memory was significantly and positively associated with self-determined motivation, over and above all previous variables, explaining an additional 2% of the variance (Table 2).

A second hierarchical regression analysis with work satisfaction as the dependent variable revealed that, at Step 1, work need satisfaction and work self-determined motivation were positively associated with work satisfaction, accounting for 51% of the variance. At Step 2, need satisfaction in the work-related memory was significantly associated with work satisfaction, explaining an additional 2% of the variance.

In a third hierarchical regression analysis, regressing burnout on the independent variables entered at Step 1 revealed that weekly hours of work were positively associated with burnout, whereas work need satisfaction and self-determined motivation were found to be negatively associated with burnout. This model explained 35% of the variance of burnout.

Table 1. Means, standard deviations, and correlations among Study 1 variables.

Variables	*M*	*SD*	1	2	3	4
Work-related memory NS (1)	1.21	1.56	–			
Need satisfaction at work (2)	5.51	0.79	.49**	–		
Self-determination index (3)	11.41	9.12	.32**	.46**	–	
Work satisfaction (4)	5.09	1.16	.41**	.52**	.66**	–
Burnout (5)	2.77	1.21	−.41**	−.53**	−.44**	−.47**

Note: **$p < .01$.
NS = Need satisfaction.

Table 2. Standardised betas coefficients of regression analyses on work satisfaction, burnout, work-related memory and work need satisfaction: Study 1.

Steps	Independent variables	Self-determined motivation	Work satisfaction	Burnout	NS at work
Step 1	Age	.17	−.04	−.03	−.04
	Sex (0 = f; 1 = m)	−.09	−.06	−.07	−.08
	Weekly hours of work	.12*	.06	.12*	−.14*
	Education	.19**	.05	.09	−.12*
	NS at work	.47**	.28**	−.38**	–
	Self-determined motivation	–	.51**	−.29**	.50**
	R^2	.28	.51	.35	.26
	$F(6, 213)$	18.97**	35.98**	18.87**	15.13**
Step 2	Work-related memory NS	.16*	.15**	−.17**	.35**
	R^2	.019	.017	.021	.102
	$F(1, 213)$	6.08*	7.30**	6.95**	34.13**

Note: *$p < .05$; **$p < .01$.
NS = Need satisfaction.

At Step 2, need satisfaction in the work-related memory was significantly and negatively associated with burnout, explaining an additional 2% of its variance.

Finally, we also regressed work need satisfaction on the independent variables to examine the contribution of need satisfaction in the work-related memory to this variable. At Step 1, weekly hours of work were negatively associated with work need satisfaction, whereas self-determined motivation was significantly and positively associated with it, together accounting for 26% of the variance. At Step 2, need satisfaction in the work-related memory was significantly and positively associated with work need satisfaction, explaining an additional 10% of its variance.

In sum, the results of Study 1 showed that need satisfaction in work-related memories is associated with self-determined motivation. It is also associated with indicators of psychological health, over and above demographic variables and levels of work need satisfaction and self-determined motivation at work. These findings suggest that work-related memories have a specific and independent impact on motivation and psychological health and can act as personal resources when they are need satisfying and as hindrances when they are need thwarting.

STUDY 2

Study 1 was cross-sectional and therefore, it was not possible to disentangle whether need satisfaction in work-related memories predict psychological health at work or whether employees with greater psychological health recall more need satisfying memories. The purpose of Study 2 was to investigate the directionality of this effect and examine whether need satisfaction in work-related memories could predict changes over time in motivation and psychological health at work. To this extent, Study 2 used a longitudinal design where participants described a work-related memory at Time 1 and completed measures of need satisfaction at work, self-determined motivation at work, work satisfaction, and burnout. At Time 2, two years later, participants completed the same scales again. We expected that need satisfaction in the work-related memory would predict increases in self-determined motivation and in work satisfaction, and decreases in burnout over this two-year period. Based on past longitudinal research assessing domain-related memories (Philippe et al., 2013), we did not expect need satisfaction in

the work-related memory to predict increases in need satisfaction at work, although we nevertheless tested this possibility.

Method

Participants

A Monte Carlo analysis was conducted to estimate the required sample size. A minimal power of .70 was deemed adequate considering the longitudinal nature of the study and the small effect sizes expected. Based on past studies on the effect of memories on long-term outcomes (Philippe et al., 2012, 2013), standardised regression coefficients between .15 and .20 were expected (except on work need satisfaction which was expected to be zero). The stability between Times 1 and 2 outcome variables was estimated at 50% of common variance and the effect of demographic variables on the outcomes was estimated from Study 1 results and literature reviews (e.g. Maslach, Schaufeli, & Leiter, 2001). Reliabilities of the outcome measures were derived from Study 1. Analyses revealed that a sample of 200 participants would yield power > .70 and > .91 to detect significant coefficients of .15 and .20, respectively, from need satisfaction in work-related memories to the outcomes, for a power above .80 to detect average coefficients (.175). A total of 256 participants were recruited at Time 1. Two years later, six participants had retired (their data were therefore discarded), 10 were then working elsewhere and could not be contacted again, 23 started completing the questionnaire at Time 2, but did not finish completing it despite several reminders sent by email, and 20 refused to complete it. Final sample was composed of 197 participants who fully completed all the scales at Time 2. Participants were employees (70% female) from different cegeps in the Province of Quebec (Canada) and included administrative support staff (26.5%), professionals (15.8%), teachers (52.6%), and executives (5.1%). They were aged 43.59 years on average ($SD = 9.78$), worked on average 37.22 hours per week ($SD = 7.19$), and had 14.37 years of experience in their current employment ($SD = 9.86$).

Measures

Work-related memory. At Time 1, participants described a work-related memory. Instructions were the same as those used in Study 1. After describing their memory, participants rated it for need satisfaction using the same three items used in Study 1. The memory description and ratings were completed at the end of the questionnaire at Time 1. Cronbach's alpha coefficient was .84 in the present study.

Outcomes. The same scales of work need satisfaction, self-determined motivation at work, work satisfaction, and burnout were used again in this study and were measured at Times 1 and 2. Cronbach's alpha coefficients were all above .75 at both time points (except for the external regulation subscale, which alpha was .69 at Time 1). Participants were also asked to describe again a work-related memory at Time 2 at the end of the questionnaire, but this will not be analysed in the present study.

Results

The same control variables as those in Study 1 were used in Study 2. A cross-lagged panel design was modelled in Mplus with Maximum Likelihood as the method of estimation.

Outcome variables measured at Time 1 were modelled to predict their measure at Time 2 (autoregressive effects) as well as all the other outcomes assessed at Time 2. Sociodemographic variables were modelled to predict all outcomes at Time 2. Finally, need satisfaction in the work-related memory was estimated to predict all outcomes at Time 2. Fit indices for such a fully identified model are irrelevant (i.e. $\chi^2 = 0$ with zero degree of freedom). Results revealed that age predicted a marginal increase in self-determined motivation and work satisfaction ($p < .10$) and a significant decrease in burnout. Education predicted a significant increase in work satisfaction and a significant decrease in burnout. More importantly, and as expected, need satisfaction in the work memory predicted increases in self-determined motivation and work satisfaction and decreases in burnout. It did not predict changes in need satisfaction at work significantly ($\delta = .08$, $p = .18$). There were no other significant relationships, except for the Time 1 variables on their Time 2 measurement and for self-determined motivation, which predicted an

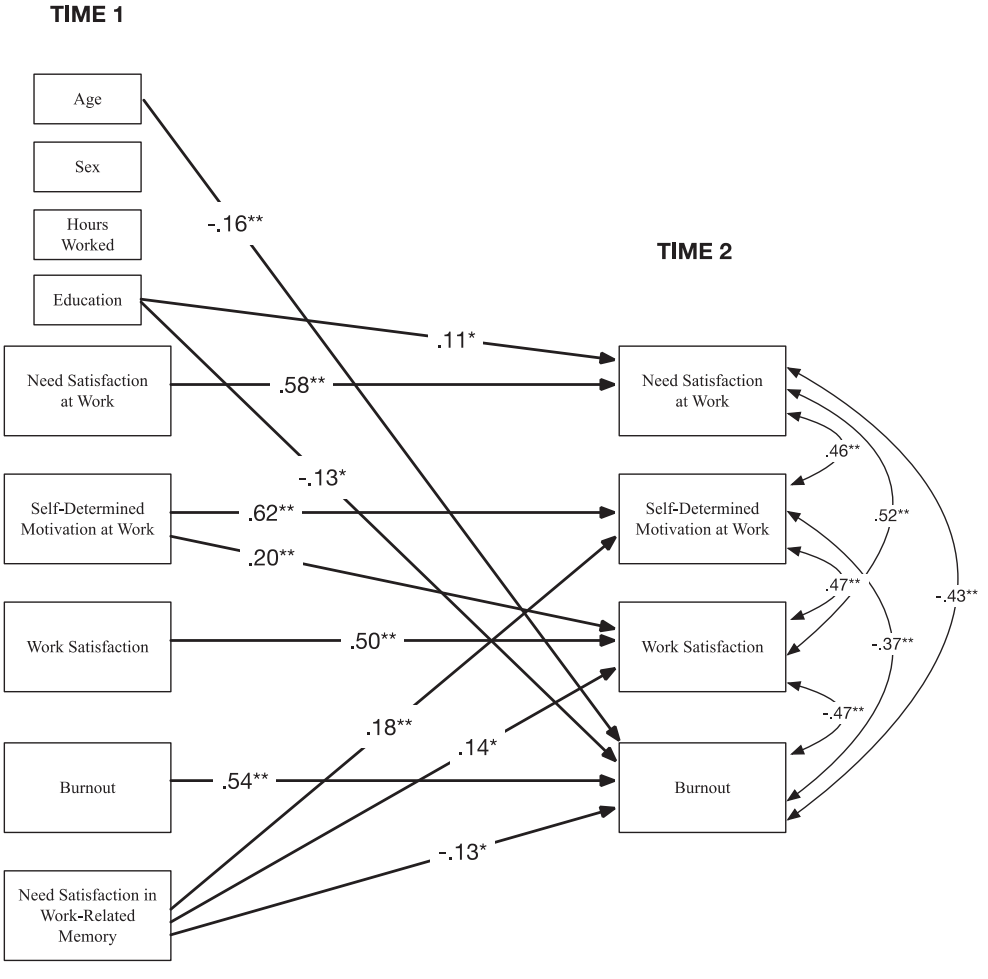

Figure 1. Path analysis of need satisfaction in work-related memory predicting changes in work self-determined motivation, work satisfaction, and burnout. Covariances among exogenous variables and non-significant paths are not shown for the sake of clarity.

increase in work satisfaction over the years. See Figure 1 for the full model. Non-significant paths are not shown in the figure for the sake of clarity.

General discussion

The purpose of the present research was to investigate whether work-related memories could have a unique impact on employee's motivation and psychological health at work. Within two studies, findings revealed that the way employees have experienced unique past work events in terms of need satisfaction plays a major role on their motivation and psychological health at work. These effects were independent of demographics and general perceptions of need satisfaction at work. In addition, the impact of these memories on indicators of psychological health were not due to employees' perceptions of motivation, that is, to the way they are motivated (in a self-determined fashion or not). Finally, these memories were found to predict changes in motivation and psychological health over time. In other words, even when holding constant initial levels of need satisfaction at work, self-determined motivation, work satisfaction, and burnout, need satisfaction in work-related memories was found to predict the direction of the changes that would occur over two years in self-determined motivation, work satisfaction, and burnout. These findings underscore the unique directive role that episodic memories related to work can play in employee's work life outcomes.

A first contribution of the present paper was to show that work-related episodic memories constitute a specific level of information that is not redundant with employees' general perceptions of their work or of external workplace factors (e.g. need satisfaction at work). Memories are unique and active information that will lead to changes in those perceptions and alter levels of psychological health over time. In a nutshell, the past – encoded as memories – is key to future psychological functioning at work, regardless of the present. Memories are constantly reconstructed and new key self-defining memories are frequently elected from the autobiographical memory base (Bouizegarene & Philippe, 2018; Conway et al., 2004). These memories become central to one's work because they represent an employee's goal or concern at work. At the time of their measurement, memories do not have had their full effect yet. This is because their effect is slow and cumulative over time and can take months or years. They slowly transform one's perceptions of motivation and slowly impact the way people feel about their work and how they feel at work. That is why they are non-redundant with general perceptions of need satisfaction at work or with motivation at work and that they predict changes in motivation and in psychological health over time, over and above baseline measures of these outcomes. These memories will typically stop having such a directive effect on outcomes once the goal to which they are linked is achieved or abandoned or that the concern is ruled out or integrated (i.e. accepted or that a psychological compromise is achieved). At that point, new self-defining memories more in line with the worker's new goals or concerns are elected and start having a novel and different influence on work outcomes (Conway et al., 2004).

People hold more than one active self-defining memories at the same time point in their life. There is still no research that has investigated the exact number of influential self-defining memories that people can typically remember at a specific time point in

their life. However, a certain number of studies have found that distinct self-defining memories are not redundant with each other and that each explains an independent and unique portion of variance in outcomes (e.g. Bouizegarene & Philippe, 2016; Philippe et al., 2012). Therefore, it can be reasonably expected that people also hold more than one work-related self-defining memories and that each memory probably contributes to predicting additional variance in the outcomes. The effect sizes reported in the present two studies are small. Yet, it remains impressive that significant effects were obtained, even over two years, for just one work-related memory. It is likely that other work-related memories are at play and contribute to additional and non-redundant variance in self-determined motivation and psychological health at work, all together accounting for a substantial portion of the variance in these outcomes. Future research is needed to quantify the amount of variance that additional work-related self-defining memories could account for in the outcomes assessed in the present research.

A second contribution is that the current findings extend past research on the directive function of episodic memories in people's lives. Past research on this topic has shown that activating a specific episodic memory or a domain-related memory by either deliberately recalling it or by using keywords derived from a memory narrative to prime it subliminally (i.e. outside of awareness) led to changes in situational well-being (Philippe & Bernard-Desrosiers, 2017; Philippe et al., 2012) and increased the likelihood of specific behaviours, such as successfully solving social problems (Kuwabara, Rouleau, & Pillemer, 2011), donating to a charity (Kuwabara & Pillemer, 2010), and motivating exercising (Biondolillo & Pillemer, 2015). Such specific episodic memories were also found to predict increases in well-being over time (Houle & Philippe, 2017; Milyavskaya et al., 2013; Philippe & Bernard-Desrosiers, 2017; Philippe et al., 2012), changes in identity processing styles and in friend satisfaction (Bouizegarene & Philippe, 2018), and greater quality of romantic relationship and a lower likelihood of romantic breakup (Philippe et al., 2013). The present research shows for the first time that work-related memories can have such a directive function on important work outcomes, such as self-determined motivation, work satisfaction, and burnout and that the effect of these memories can last for at least two years. As such, work-related memories can both increase employee motivation and alleviate their psychological strain at work.

Finally, a third contribution is to highlight a novel applied perspective of intervention for organisations. The present findings underscore the importance for employers and employees of evaluating and revisiting negative work memories. As mentioned in the introduction, not all negative work events will be encoded as memories and even a smaller number will become self-defining memories. However, it may be important to detect those need-thwarting self-defining work memories and act upon them. Key to this reconstructive endeavour will be to reinterpret the experience of need thwarting events, acknowledge them, or support the person through it (Ryan & Deci, 2008). Another strategy is to create self-defining moments for employees by sustaining positive memories in workers' mind. Since life episodes affecting the needs of autonomy, competence, and relatedness will be particularly well remembered and are more likely to remain chronically accessible, employers could develop strategies to build self-defining moments on these themes by providing employees with special initiatives, challenges meeting their expertise and positive feedback (competence), as well as strong acknowledgment of their

importance to the organisation (relatedness). Much relatedness also emerges through work-related social events, parties, and happy hours, and these types of events are certainly not superfluous at potentially creating self-defining moments.

Limitations

A certain number of limitations need to be underscored from the present research. First, only employees from cegeps in Quebec were recruited in both studies. This means that the present findings may not be generalisable to other occupations, industries, or cultures. Future research could examine whether work-related memories are as predictive of motivational and psychological health outcomes across different types of context. A second limitation is that, as mentioned above, only one work-related memory was assessed in each study. The effect sizes obtained are therefore small. Future research could assess more than one work memories in order to better estimate the amount of unique variance in work outcomes that can be accounted for by memories. A third limitation is that all data collected were self-reported. This increases the risk of common shared method variance among variables. This limitation was slightly attenuated by controlling for need satisfaction at work in general. The shared method variance between the measures of need satisfaction in the work-related memory and of need satisfaction at work in general was partial out by entering these measures as two distinct independent variables. Nevertheless, replicating the present results using more objective measures of motivation and psychological health would strengthen them.

In sum, the present research shows for the first time that work-related memories matter, are not redundant with general perceptions of environmental factors at work, and predict changes in motivation and psychological health over time. We hope that the present findings will prompt researchers' interest on the importance of workers' memories for organisations.

Notes

1. Philippe, Bouizegarene, Guilbault, Rajotte, and Houle (2015) recommended that memory measures should always be collected last to avoid influencing other more general measures related to well-being.
2. Memories were also coded for valence (positive or negative) and we examined whether they moderated the results. All moderations were non-significant, therefore, this variable will not be further analysed in the present research.

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