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But the memories last forever...

Vacation Reminiscence and Recovery from Job Stress: A Psychological Needs

Perspective

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Abstract

Background. Research shows that vacationing can increase well-being. However, these effects do not seem to last long. Research on written reminiscing suggests that positive holiday memories may temporarily raise well-being, thereby buffering or undoing job stress and prolonging positive vacation effects. Satisfaction of six psychological needs is expected to explain the relationship between vacation (memories) and well-being: **Detachment, Relaxation, Autonomy, Mastery, Meaning and Affiliation** (= DRAMMA).

Method. An experimental study with a student population ($N = 85$) was conducted in the laboratory. DRAMMA aspects were measured with a self-report questionnaire, based on existing, validated scales. Fatigue was monitored with digital self-reports before, during and after demanding tasks and a subsequent written reminiscence assignment. After the demanding tasks, the experimental group recalled and wrote down memories of a nice holiday whereas the control group recalled a nice evening. Written texts were analyzed for satisfaction of the six needs.

Results. Qualitative analyses of the written holiday memories showed that all six assumed DRAMMA mechanisms could be found in the texts. Six additional mechanisms were found that may not be fully covered in the DRAMMA model. Moreover, repeated measures ANOVAs showed that reminiscing was beneficial for recovery from stress: Fatigue decreased after written reminiscence. Particularly autonomy and affiliation contributed to a decrease in fatigue. Despite the fact that vacation memories produced significantly higher levels of meaning, there was no difference between the two experimental groups concerning fatigue after the reminiscence task.

Discussion and Conclusion. Written reminiscence on positive past events seems to help people to recover from stress after cognitively draining tasks. Vacation memories seem to assist people to find purpose in life. The DRAMMA model provides a useful framework for research on recovery from job stress based on the idea that leisure time offers employees the

opportunity to fulfill psychological needs. It broadens the well-known recovery experiences perspective by including the important factors of meaning and affiliation. More research in larger samples using varied research designs is needed to arrive at a better understanding of the role of psychological need satisfaction during work and leisure time.

Key words: vacation, reminiscence, recovery, DRAMMA

Vacations as Recovery from Job Stress:

A Psychological Needs Perspective

At rough estimate, in 1900 just 0.1 percent of the working class had the right to go on a short, unpaid vacation once per year. Most workers had to work long hours for six days a week to earn a living and only Sundays and religious holidays were off (Reulecke, 1976). An article which appeared in the New York Times in 1910 can be considered first evidence of a societal change. In this article, businessmen, academics, and politicians debated whether working people need vacations from work. Most of the interviewees suspected that vacationing may be beneficial for health, work ethic, and work performance, and could consequently imply an economic advantage for employers.

Nowadays, in Western industrialized countries, regular time-off from work is considered an integral part of working life and vacations are deemed an essential element of quality of life (Filep, 2012; Richards, 1999). Since 1993, every employee in the European Union has the legal right to at least four weeks of paid vacation per year (EC of the European Parliament and the Council, 1993). On average, Europeans enjoy even five weeks of annual leave (European Foundation for the Improvement of Living and Working Conditions, 2008). Vacations are also “big business”. Tourism is one of the largest and fastest growing economic sectors and according the World Travel and Tourism Council (2016), one in eleven jobs and 9.8% of global GDP are related to tourism). But are the time and money devoted to vacations wisely spent?

In this article, we will briefly review the existing empirical evidence on the effects of vacationing on physical and mental well-being, as well as on job performance. Subsequently, we will present a model of psychological need satisfaction developed by Newman, Tay, and Diener (2014) which can be applied to holidays in order to explain why prolonged off-job time such as a vacation may be associated with positive outcomes for body and mind. In the last part of the article, we will present the preliminary results from an experimental study

examining the potential of actively recalling holiday memories for prolonging beneficial vacation effects.

Recovery from Work: Vacation Resort as Last Resort?

A globalized economy, an aging labor force and technological advancements such as smart mobile ICT devices have led to structural changes in the way work is organized, carried out and experienced (Ulferts, Korunka, & Kubicek, 2013). The very concept of work becomes more and more flexible, accompanied by a changing nature of employment relationships such as temporary and project-based work, and high levels of job insecurity (Lundberg & Cooper, 2010; Major & Germano, 2006). Spatial and temporal boundaries between work and non-work vanish while workload increases resulting in ‘always on, never done’ attitudes (Ďuranová & Ohly, 2016; Eurofund, 2015). This makes it increasingly difficult for employees to recover from job stress during off-job time (Derks et al., 2014), which in turn has detrimental consequences for their subjective well-being and performance (Amelsvoort, Kant, Bultmann, & Swaen, 2003; Arlinghaus & Nachreiner, 2014; Sluiter et al., 2003).

Consequently, recovery as an antagonist of work stress plays a crucial role in protecting employees’ health and well-being (Geurts & Sonnentag, 2006). Recovery can be defined as ‘[...] replenishing of psychological and physical resources that have been depleted by effortful demands’ (Ragsdale et al., 2011). It refers to a person’s unwinding and restoration processes to pre-stressor level after exposure to a stressor or other demand (Craig & Cooper, 1992). According to Sonnentag, Venz and Casper (2017), recovery ‘[...] captures a person’s psychological or physiological state that is reached after a recovery period’ (p. 2).

Diary studies have revealed that workers often recover insufficiently during regular evening hours and weekends, for instance due to working overtime (Fritz & Sonnentag, 2005; Van Hooff, Geurts, Kompier & Taris, 2007). Employees also often ruminate about problems at work, unfinished work tasks or difficult tasks awaiting (Radstaak et al., 2011; Syrek & Antoni, 2014). In fact, rumination about past stressors and worrying about future stressors can

set off similar psycho-physiological responses as a stressful situation experienced in the present moment (see for instance Brosschot, Pieper, and Thayer's work on perseverative cognition (2006) or Ursin and Eriksen's experiments on the cognitive activation theory of stress (2010)). It has been found that after busy days at work, the body needs significantly longer to return to its baseline levels in adrenaline excretion than after regular working days (Meijman, Mulder, van Dormolen, & Cremer, 1992). Vacation as a relatively long period of rest and physical distance from the work environment is presumably a prime opportunity to help employees to fully recover from demanding work and it constitutes a powerful weapon against job stress and its negative consequences.

Vacation Effects on Health, Well-Being and Performance

Two literature reviews reported that vacationing is associated with health and well-being benefits (Chen & Petrick, 2013; De Bloom et al., 2009). After vacation, compared to before vacation, vacationers reported, for instance, fewer health complaints (Fritz & Sonnentag, 2006; Strauss-Blasche et al., 2000), lower levels of exhaustion (Etzion, 2003; Westman & Eden, 1997; Westman & Etzion, 2001) and higher life satisfaction (Gilbert & Abdullah, 2004; Lounsbury & Hoopes, 1986; Strauss-Blasche, Ekmekcioglu, & Marktl, 2000). More recent studies could replicate and broaden these findings and showed significant associations between vacationing, positive hedonic affect balance (Nawijn, 2011; Nawijn, Mitas, Lin, & Kerstetter, 2013), increases in life satisfaction (Chen, Huang, & Petrick, 2016) and work engagement, as well as decreases in burnout (Kühnel & Sonnentag, 2011) and population-level dispensation of antidepressants during vacation periods (Hartig, Catalano, Ong, & Syme, 2013).

However, empirical studies also showed that beneficial vacation effects are generally short-lived. Only one or two weeks after returning to work, positive effects have vanished, even after vacations of several weeks (e.g., Davidson et al., 2010; De Bloom et al., 2009; De Bloom et al., 2013). Considering the short duration of beneficial vacation effects after

resuming work, should we abandon vacations and have only short periods off at the most?

Better not!

Two long-term epidemiological studies have found that not taking vacations for a prolonged time is associated with a higher risk of cardiovascular disease, heart attacks, and even premature coronary death (Eaker et al., 1992; Gump & Matthews, 2000). In other studies, taking fewer vacations was linked to more physical health complaints, higher frequency of employee disease (Tarumi, Hagihara, & Morimoto, 1998) and absenteeism rates (Westman & Etzion, 2001). Studies on the relationship between vacationing and job performance are scarce, but diary studies on shorter recovery episodes have demonstrated that workers who feel mentally and physically refreshed upon the start of their work day experience their work as effortless, are more willing to help their colleagues and display other forms of organizational citizenship behaviors as well as high self-rated task performance (Binnewies, Sonnentag, & Mojza, 2009). In a pre-post study using an 'idea generation task' to assess creativity prior to and after a vacation, findings indicated that working people's cognitive flexibility increased after their vacation (De Bloom et al., 2014). This means the range of ideas people produced upon returning to work was wider, suggesting that it is more likely that vacationers do not rely on conventional ideas and routine solutions and consider different aspects of a problem. Moreover, studies suggest that vacations improve communication in couples, create feelings of relatedness and increase family cohesion (e.g., Durko & Pertrick, 2013; Lehto, Lin, Chen, & Choi, 2012; Shaw, Havitz, & Delemere, 2008).

Surprisingly, the role of vacation memories in temporarily increasing people's mood has not been investigated. In general, people tend to recollect positive memories to enhance their mood and current well-being (Parrott & Sabini, 1990) and autobiographical storytelling is related to improvements in purpose of life, physical and mental well-being (e.g., Bryant, Smart, & King, 2005; Burton & King, 2004; Jose, Lim, & Bryant, 2012; Pinquart & Forstmeier, 2012). Thus, it can be speculated that positive vacation memories may serve as a

resource, which can buffer stress, reduce negative affect, and increase positive affect.

Accordingly, instead of asking if we should take holidays, a better question would be how we should spend our holidays to make the most of it. What ingredients make a good holiday and potentially increase and prolong its beneficial effects on health and well-being? And can active recollection of positive vacation memories reduce stress? In the following paragraphs, we will describe a theoretical model which can explain why vacations may affect well-being. Subsequently, we will describe an experimental study in which we examined the role of vacation reminiscence in recovery from demanding tasks.

Making Holidays Work: Psychological Need Satisfaction

In 2014, based on a meta-analysis of 363 peer-reviewed articles and book chapters, Newman, et al. published a model explaining how leisure can enhance subjective well-being (including increased life satisfaction, positive affect, and decreased negative affect). This interdisciplinary model explains the link between leisure and well-being through satisfaction of the following psychological needs: Detachment-Recovery, Autonomy, Mastery, Meaning, and Affiliation (abbreviated as DRAMMA). Need theories have a long history in psychological research: Needs drive human behavior and need satisfaction is linked to well-being and high performance (e.g., Alderfer, 1972; Maslow, 1954; McClelland, 1965; Ryan & Deci, 2000). Fluctuations in daily need satisfaction also explain fluctuations in well-being (Ryan, Bernstein, & Brown, 2010; Van Hooff & Geurts, 2015). In our view, the DRAMMA model is particularly appealing, because it combines insights from (work- and organizational) psychology with knowledge from leisure sciences. More precisely, the model captures the two basic elements and complementary processes of almost any psychological theory on human behavior and motivation: homeostasis and hedonism.

Homeostasis and Hedonism

Adhering to the principle of homeostasis, humans are motivated to maintain stability and avoid states of disequilibrium. Put simply: if a person has worked hard, s/he needs to rest. In

leisure motivation research, this idea has been referred to as “stimulus avoidance” (Beard & Ragheb, 1983). Homeostasis describes a reduction of demands and constitutes a ‘push-factor’ (Kuykendall et al., 2015). The most widely used model in research on recovery from stress, the effort-recovery model (Meijman & Mulder, 1998), is likewise grounded on the assumption that periods of time during which people fulfill responsibilities and invest effort activate physiological and psychological changes in the body and mind. When effort is suspended, these changes can be reversed. Moreover, the conservation of resources theory (Hobfoll, 1998), another frequently applied theory in recovery research, states that people have a powerful urge to stop the loss of resources and to rebuild lost resources. To prevent deterioration of well-being and the loss of valuable resources, people need to take a break from work and indulge on leisure time. It can be speculated that satisfaction of the need for homeostasis mainly relates to a decrease in negative affect, rather than to an increase of positive affect (Newman et al., 2014). Of the DRAMMA model, detachment-recovery relates to homeostasis.

Following the principle of hedonism, humans are also motivated to attain new resources and pleasure. Accordingly, regarding recovery, hedonism refers to a promotion focus, approach motivation or ‘pull-factors’ (Elliot, 1999). It can be speculated that leisure activities which fulfill people’s intrinsic need of pleasure, relate primarily to an increase in positive affect rather than a decrease in negative affect (Newman et al., 2014). In the DRAMMA model, autonomy, mastery, meaning, and affiliation relate to hedonism. In the following, we will describe each element of the DRAMMA-model separately.

DRAMMA connecting Leisure and Well-Being

Detachment-Recovery derives from and has mainly been investigated within the field of work psychology. While Newman et al. (2014) conceive this as one factor, we suppose that this factor should be divided in two factors: Detachment and Relaxation. Applying this division helps to integrate the body of literature on recovery from work into leisure sciences.

Detachment refers to psychological disengagement from work-related thoughts and its importance for employee well-being has been widely demonstrated (Siltaloppi, Kinnunen, & Feldt, 2009; Sonnentag & Fritz, 2015; Sonnentag, Kuttler, & Fritz, 2010). Recovery, as defined in the DRAMMA model, closely resembles what recovery researchers have labeled more precisely as 'relaxation', which implies low levels of mental or physical activation and little physical or intellectual effort (Sonnentag & Fritz, 2007). Research found that individuals often report relaxation to be characterized by low social, physical and intellectual demands (Tinsley & Eldredge, 1995). Iwasaki, Mannell, Smale, and Butcher (2005) found in their repeated measures study with 132 police and emergency workers that relaxing leisure activities were the strongest predictor of effective coping with stress compared to six other types of leisure, such as hobbies, social, cultural, outdoor, and physical leisure.

Autonomy describes the inherent desire for decision latitude and the wish to act with a sense of choice and volition, representing a basic human need (Ryan & Deci, 2000). Leisure time provides the perfect chance to participate in those activities one is autonomously (i.e., internally) motivated for as there is no boss or authorial figure involved, telling one what (s)he ought to do.

Mastery encompasses learning opportunities and the urge to bring about desired outcomes, seeking and overcoming challenges and extending physical and psychological skills (Deci & Ryan, 2000). It occurs in a situation of perfect balance between skill and challenge, after which one experiences a sense of accomplishment. Therefore, mastery experiences are similar to flow experiences (Csikszentmihalyi, 2013). Feelings that are tied to mastery experiences, such as self-enrichment, involvement, and absorption also closely relate to the satisfaction of people's basic need of 'competence' (Ryan & Deci, 2001). A diary study by Mojza, Lorenz, Sonnentag, and Binnewies (2010) on the effects of volunteer work during leisure time found that volunteer work increases well-being by providing learning possibilities and opportunities to master challenges.

Meaning refers to the need to achieve a sense of purpose in life and doing something useful (Stebbins, 1997; 2015). Iwasaki (2016) describes key elements of leisure activities that enhance meaning, such as increasing identity, creativity, spiritual connectedness, harmony and balance, transformation, and experiential and existential experiences. Meaningful activities provide tranquility and peace of mind, self-worth growth, physical and social engagement (Newman et al., 2014). In leisure sciences, meaning has been researched in the form of serious leisure. Serious leisure is conceptualized by Stebbins (1992, p.3) as “the systematic pursuit of deep satisfaction through an amateur, hobbyist, or volunteer activity that participants find so substantial and interesting that, in the typical case, they launch themselves on a career centered on acquiring and expressing its special skill, knowledge, and experience.” Research among participants with mental illnesses reported that leisure activities that include sense-making, such as an increasing the sense of connection, belonging and identity, are highly beneficial to participants’ recovery from illness (Iwasaki et al., 2014).

Affiliation describes the need to belong and to feel connected to others, to love and care, and be loved and cared for (Baumeister & Leary, 1995; Beard & Ragheb, 1983). In the hierarchy of needs model of Maslow (1954), the third level is the need to be loved and experience belongingness. This means, affiliation is seen as a prime human need. It is also a basic need according to the self-determination theory of Ryan and Deci (2001). Vacation activities that increase the fulfilment of this basic need are therefore expected to be beneficial for well-being (Trainor, Delfabbro, Winefield, & Anderson, 2010; Waters & Moore, 2002). Brajša-Žganec, Merkaš, and Šverko (2011) found in their cross-sectional study in 4000 Croatian citizens that those who report spending time with meaningful others, such as friends and family, experienced higher well-being and satisfaction with life than people who spent less time with meaningful others. The earlier mentioned diary study on the effects of volunteer work during leisure time also indicated that volunteer work increases well-being by providing ‘community experiences’, activities that enhance opportunities for social contacts

and connectedness with others (Mojza et al., 2010).

To our knowledge, the DRAMMA model has not been investigated as an overarching framework regarding vacations. There is, however, some evidence from empirical studies demonstrating that vacationing is related to the six DRAMMA factors. For instance, increases in health and well-being were greater for vacationers who were able to detach from their work and connect with their partners during holidays (e.g., De Bloom et al., 2011; Fritz & Sonnentag, 2006). Relaxation and autonomy in how to spend one's holiday relate to stronger and longer lasting vacation effects on health and well-being (De Bloom, Geurts, & Kompier, 2012) and mastery experiences during vacations relate to lower fatigue and higher life satisfaction upon returning to work (Fritz & Sonnentag, 2006; Sonnentag & Fritz, 2007). Research on people who engage in volunteer work during their vacations reported the experience of love, care, curiosity, understanding, and appreciation (Brown, 2005).

Experimental Study on Vacation Reminiscence and DRAMMA

We designed an experimental study to investigate whether positive vacation reminiscence can help people to recover from demanding tasks. From earlier experimental studies, we learned that recalling positive autobiographical memories can reduce the hypothalamic–pituitary–adrenal axis stress response and negative affect during stressful tasks (Speer & Delgado, 2017). Positive work reflection has also been linked to increased hope, optimism and affective well-being, and to lower levels of emotional exhaustion and fatigue (Clauss et al., 2016; Meier, Cho, & Dumani, 2016). As it is well-established that memories with positive valence have an advantage in terms of mood regulation and stress reduction compared to recollections of neutral memories (e.g., Fredrickson, Mancuso, Branigan, & Tugade, 2000), we focused on the question whether vacation memories constitute a special type of autobiographical memories, which may be particularly suitable to help employees recover from demanding tasks and lower levels of fatigue. To arrive at a deeper understanding of the type of memories people recollected, we also assessed qualitatively whether the assumed

DRAMMA mechanisms could indeed be found in written holiday recollections.

Method

Procedure

This study was a controlled, experimental study in the laboratory of Trier University (Germany) and took place in November 2015. Participants were recruited with the help of a poster with the headline “Which recovery type are you?”, which was displayed at the university campus and potential participants could sign in by writing their name on the poster. The poster contained a very short text introducing the study. It stated that the study was about recovery and how recovery from stress can be improved. After participation in the experiment, the purpose of the study was disclosed to the participants orally and each participant received individual feedback on his/her recovery profile and tips on how to improve recovery. As an additional incentive for participation, participants would receive compensation in the form of 150 participant minutes (of a total of 1800 minutes requested by the department). We also raffled six prizes (vouchers for dining at a local restaurant) between the participants, each worth 10 €. The winners of the prizes were announced after the study was finished (in December 2015).

The respondents assigned to the experimental group were asked to bring a tangible souvenir from their best holiday with them to the experiment (such as a printed photograph). No such request was made to the control group. This treatment in the control group was chosen to make the two conditions comparable, so that a difference in results could be accounted to the difference between vacation memories and other positive memories. No further information was given prior to the experiment, and when participants entered the lab they had to sign an agreement to keep the content and aims of the study secret. After filling out a digital self-report questionnaire on basic background information, baseline levels of fatigue were measured (T1).

In the next stage of the experiment, all participants were exposed to several demanding

mental tasks requiring high levels of executive control, simulating a busy day at work. The tasks contained preparing a power point presentation, a concentration test, mental problem-solving exercises, mental arithmetic's and a creative thinking exercise, which were carried out successively. Immediately after these tasks, participants were asked to fill out another digital questionnaire rating their fatigue (T2). In the next step, participants engaged in written reminiscence for 15 minutes. Finally, participants again indicated their level of fatigue (T3) and finally they filled in a questionnaire on DRAMMA with regard to the written reminiscence. Participants needed between 90 minutes and 140 minutes to complete the entire experiment.

Participants

The convenience sample consisted of 85 students (87% female) between 18 and 27 years ($M = 20.59$, $SD = 2.01$). Before the experiment, students were randomly assigned a random decimal number between 0 and 1 using the RAND function in Microsoft Excel. This number was used to assign them to either the experimental group (i.e., vacation reminiscence with memorabilia (44 persons), or to the control group, reflecting on a nice evening (41 persons)).

Measures

We constructed a questionnaire to measure each element of DRAMMA in the holiday memories, which participants answered at the end of the experiment after they engaged in written reminiscence. Three items to measure detachment were adapted from the well-validated recovery experience questionnaire (Sonnentag & Fritz, 2007) and the rumination scale (Mohr, Müller, Rigotti, Aycan, & Tschan, 2006). Relaxation and mastery were measured with the well-validated recovery experience questionnaire with three items each (Sonnentag & Fritz, 2007). To measure meaning, we reformulated three items from the “job diagnostic survey” (Hackman & Oldham, 1974) to apply to leisure time. Autonomy and affiliation were assessed each with three items adapted from the “basic need satisfaction in general scale” (Johnston & Finney, 2010). The newly constructed DRAMMA scale started

with the introductory sentence: “*In the situation I have just written down, ...*” followed by the 18 items. For an overview of the final scale, see Table 1. We used the validated “three-dimensional work fatigue inventory” (Frone & Tidwell, 2015) to measure mental fatigue. Answers could range between 1 (not at all) to 5 (very much).

Scale Construction, Factor Analysis and Correlations

In order to examine whether the six recovery mechanisms represent distinct constructs, we conducted a confirmatory factor analysis with these 18 items by specifying a six-factor structure. This 18-item model resulted in an acceptable fit ($\chi^2 = 180.69$; $df = 120$; $CFI = .92$; $TLI = .90$; $RMSEA = .07$; $SRMR = .08$). This model showed a better fit than a one-factor model ($\Delta\chi^2 = 450.83$, $\Delta df = 15$, $p < .000$) as well as all five-factor models in which the most correlated dimensions loaded on one factor ($\Delta\chi^2 \geq 107.69$, $\Delta df = 5$, $p < .001$). Factor loadings and Cronbach’s alphas for the DRAMMA scale in its subcomponents can be found in Table 1. Factor loadings on each factor were high and ranged between .58 and .95. Internal consistency of the subscales as indicated by Cronbach’s alphas ranged between .75 and .86 and were acceptable.

In order to gain a better understanding of the relationships between the dimensions, we examined the intercorrelations. Rather expectedly relaxation and detachment correlated highest (Table 2). On the one hand, this is in line with Newman et al.’s approach to combine the two dimensions (Detachment-Recovery), on the other hand the correlation is rather moderate and indicates that these facets share only 25% of their variance and therefore measure distinct experiences. Further, detachment as well as relaxation correlated moderately with autonomy. Another correlation that deserves attention is the significant relationship between mastery and meaning.

Results

DRAMMA in Vacation Memories

In the next step, we analyzed the written vacation reminiscence in greater detail. To identify the DRAMMA elements we used qualitative content analysis, which consists of a systematic assignment of categories (in this case DRAMMA) to text material and the subsequent quantitative processing by means of category frequencies (Mayring, 2001, 2010). For this purpose, a coding guide was drawn up based on Mayring (2010). This guide contained a tabular summary of the pre-defined categories including keywords, anchor examples from the texts, and delimiting coding rules for other DRAMMA elements. The definition of the categories was based both on the review by Newman et al. (2014) and the scales used for the DRAMMA questionnaire (Fritz & Sonnentag, 2007; Hackman & Oldham, 1974; Johnston & Finney, 2010). In addition to the DRAMMA dimensions described above, the raters identified six additional themes in the texts after reading all texts several times: culinary experiences (i.e., fully enjoying a delicious meal with all senses, indulgence), aesthetics (i.e., enjoying the beauty of nature or art), humor (i.e., joking and having fun), music (i.e., listening to one's favorite music) and cultural experiences (i.e., visiting a museum or the theatre). The entire text material of all 85 subjects was analyzed by three raters independently following the described coding scheme. After this, the three raters met and discussed the instances in which they disagreed to reach consensus. If no consensus could be reached, a majority vote decided whether a DRAMMA dimension was assigned to a text or not.

All elements of the DRAMMA model could be identified in the written texts. Examples for vacation memories including detachment are: „*All my thoughts fly away. I do not need to deal with them anymore.*“, „*During this holiday, I have not thought about school or work at all.*“. Relaxation became evident in quotes such as: „*I love to do nothing at all, listening to the waves or reading a book and losing myself in this book.*“, „*We have had long walks on the*

beach or have sat down to read a book in peace.“ or „We relaxed every day on our beach chairs at the pool or at the beach.” Autonomy during vacation was shown in expressions such as: *„I especially loved the feeling of freedom and independence. We could do as we pleased.“*, *„During the last week, I traveled alone. This week was the epitome of freedom for me.“* Quotes which reflect mastery were: *“During this holiday, I learned windsurfing, which was a lot of fun.“*, *„I exercised a lot during this holiday and I was able to burn off energy while doing yoga, zumba or Thai boxing at the sea side.“*, *„I have fulfilled my dream of skydiving there.”* The following sentences exemplified meaningful vacation memories: *„I indulged on art. Art satisfies me and inspires my life“*, *„Every time, a little bit more of this relaxation and inspiration transpires to my everyday life“*, *„I had the chance to develop myself in new ways.“*, *„I appreciated this freedom and saw this holiday as a transformation to my new life.“* Finally, examples for memories including affiliation were: *„I like to recall this vacation, because I could do a lot of things with my family“*, *„I was there with people that I really like and we always had something to laugh and talk about.”*, *“The local residents are very happy if you eat with them and they are very hospitable”*, *„I think that this time has brought us closer together.”*

Participants wrote on average 309 words about their positive memory. The experimental group wrote 95 words more than the control group ($t(83) = -3.37, p < .001$). Most vacation memories took place abroad and 11 recalled memories were about domestic holidays (25% of the vacation memories). Memories most often included friends or family members that participants felt very close to.

Differences in DRAMMA and Fatigue between the Groups

Our analyses further showed that all participants' level of fatigue increased significantly after the demanding tasks ($F(84,1) = 50.01, p < .001$), serving as a manipulation check. Task difficulty of the tasks was rated 7.5 on a scale from 1 (very easy) to 10 (extremely difficult). This means, the demanding tasks we designed were experienced as such and increased fatigue.

In general, the mean levels of DRAMMA were relatively high. The lowest mean was found for mastery ($M = 3.07, SD = 1.00$), and the highest mean was found for affiliation ($M = 4.10, SD = .60$). We then tested whether the experimental group differed from the control group with regard to the six DRAMMA elements and fatigue on the three measurement occasions (see Table 3). Concerning the means of DRAMMA between the two groups, detachment, relaxation, autonomy and mastery were similar in the experimental and the control group. Meaning was higher for the experimental group ($F(84,1) = 11.19, p < .001$) whereas affiliation was higher for the control group ($F(84,1) = 81.35, p < .001$). Levels of fatigue were the same for both groups on the three measurement occasions. In order to examine how much variance in fatigue at time 3 could be attributed to the DRAMMA mechanisms, we ran a hierarchical regression analysis. We controlled for age, gender, education level, and fatigue at time 2 in the first step. The DRAMMA mechanisms were entered in the second step. Results showed that the DRAMMA variables explained nine per cent of the change in fatigue from T2 to T3. Of all DRAMMA variables, autonomy ($\beta = -.23, p < .001$) and affiliation ($\beta = -.16, p < .01$) explained most variance (Table 4).

We further analyzed a 3 (occasion: three measurement points) x 2 (experimental and control group) multivariate analysis of variance (MANOVA) with repeated measures on the occasion. Multivariate analysis of variance revealed a main effect of occasion ($F(2, 82) = 34.86, p < .001; \eta^2 = .46$), which indicated that fatigue at time 2 differed significantly from time 1 as well as from time 3. The main effect of experimental vs. control group was not

significant ($F(1,83) = 0.21, p = .65, \eta^2 = .003$). There was a significant occasion x group interaction effect ($F(2,82) = 3.22, p < .05; \eta^2 = .07$) indicating that this across-time change was different between the two groups. The control group seemed to profit more from the reminiscence assignment than the experimental group as the fatigue dropped at time 3 even below the fatigue level at time 1, while fatigue at time 3 dropped for the experimental group as well, but not as strongly as for the control group.

Qualitative Analyses

Qualitative analysis of the written reminiscence showed that all six DRAMMA elements as well as the additional dimensions aesthetic experience, culinary experiences, cultural experiences, musical experiences, humor experiences occurred at least once in both holiday and evening memories. Of these dimensions, affiliation was most often described (in 95.5% of all texts), followed by culinary experiences (80.0%), and relaxation (57.6%). With regard to these three dimensions we did not find significant differences between the experimental and control group (Table 5). However, there were significant differences concerning the dimensions of autonomy: The experimental group reported significantly more autonomy than the control group. Moreover, the experimental group reported significantly more aesthetic experiences than the control group. All other dimensions did not differ significantly between experimental and control group.

We calculated t-tests to examine whether persons who referred to the DRAMMA dimension in the text (externally rated) also scored higher on the respective DRAMMA scale from the self-report questionnaire. Results showed no differences with regard to detachment, relaxation, mastery, meaning, and affiliation. However, persons who explicitly mentioned autonomy experiences in their written statements reported significantly lower autonomy in the self-report questionnaire ($t = 1.81, df = 83, p < .05$). Surprisingly, the externally identified recovery dimension (based on the written texts on the reminisced episode) is therefore not indicative for the quantitative self-assessment of the recovery experience of the very same

episode.

Research on recovery underlines the benefit of focusing on recovery experiences instead of specific activities as the same activity can differ with regard to the underlying recovery mechanism. However, in order to shed more light on the question what people reminisce about when thinking about a vacation or evening, we categorized the activities in the written statements of both groups. Most texts referred to socializing activities (75.3%), followed by activities related to cooking and eating (70.6%). The experimental group significantly mentioned more often activities in the nature, low intensity sports, high intensity sports, as well as reading, the latter was not mentioned in the control group at all. The control group described significantly more often activities related to passive entertainment.

Discussion

In this paper, we examined the role of vacations in promoting recovery from job stress and we tested the DRAMMA model in explaining changes in fatigue after effortful tasks.

Vacation as the longest, uninterrupted period of respite from work can stop the loss of resources, rebuild lost resources (prevention) and can build new resources (promotion).

Vacations are linked to homeostasis as they provide possibilities to detach from work related thoughts and to relax. This enables people to return to baseline levels of psycho-physiological functioning (De Bloom, Geurts, & Kompier, 2010). Moreover, vacations are linked to hedonism as they fulfill people's need for autonomy, mastery, meaning and affiliation. Accordingly, detachment, relaxation, autonomy, mastery, meaning, and affiliation are assumed to play a key role in the recovery process (Newman, Tay, & Diener, 2014).

Our empirical study demonstrated that each element of the DRAMMA model can be found in written vacation memories. The relationships between the different DRAMMA dimensions imply that persons, who feel in control how to use their leisure time, are able to mentally detach and relax. Persons who (in a positive way) push themselves more to overcome personal challenges often report that they did something meaningful. This strong connection

implies that a sense of purpose is closely associated with seeking and overcoming personal challenges.

In line with our argument, people seem to find vacation memories more meaningful than memories of a nice evening. Moreover, our data suggests that positive memories help to undo the negative effect of demanding tasks.

The fact that the control group profited more from the memory of a nice evening than the experimental group profited from the memory of a vacation in terms of reduced fatigue, one might speculate whether the temporal proximity of the nice evening lead to a stronger reduction in fatigue. Another explanation might be that the control group described (as it was their first week of studying) personally highly important episodes (such as meeting new people, living for the first time away from home, exploring the city they just moved to).

Qualitative Analyses and Differences between Qualitative and Quantitative Results

In sum, quantitative and qualitative data analyses offer different insights into the recovery mechanisms, which explain how leisure can enhance subjective well-being. On the one hand, the quantitative analysis provides information about the level of the six recovery dimensions, which were experienced in the reminisced episode. The quantitative results indicate that vacation episodes triggered more experiences of meaning, while evening episodes activated more experiences of affiliation. On the other hand, the qualitative analysis gives information about the presence of the recovery dimensions as well as the kind of activity described in the reminisced episode. The qualitative results (as externally evaluated by three independent raters) imply that vacation episodes contained more often experiences referring to autonomy than evening episodes. With regard to activities, vacation episodes contained more often the description of activities in the nature, reading, and sports, while the evening episodes more often mentioned activities referring to rather passive entertainment such as watching a movie.

We did not find that the presence of a recovery dimension (qualitative analysis) indicated a higher subjective level of that dimension within the same reminisced episode (quantitative assessment), i.e. persons who explicitly mentioned detachment in the text did not necessarily report higher levels of detachment than persons who did not explicitly write about the experience of detachment. At first sight, this mismatch between qualitative (i.e., externally rated DRAMMA based on written texts) and quantitative analyses (i.e., self-reports) seems surprising. At second sight, the processes involved are more complex: When a person reminisce an episode and then describes it, the description implies a reduction in content – one has to selectively decide what aspects should be mentioned and thus reduces much of the cognitions and emotions triggered by reminiscing the episode. Thus, a person who did not explicitly mention a certain dimension might have fully experienced this dimension if asked to recall the quality of specific recovery mechanisms in a questionnaire. Thus, the combination of qualitative and quantitative research data is less suitable for comparison but rather points to the mutual enrichment of both research methods.

The qualitative analysis also revealed some shortcomings concerning the DRAMMA dimensions and disclosed several potential themes/experiences that are not explicit parts of the DRAMMA model, but that might play a crucial role in peoples' vacation memories. Some themes were recurrently mentioned by the participants, but not fully covered by the DRAMMA dimensions. For instance, culinary experiences were a common theme. We classified culinary experiences not only as an activity (having had something to eat), but rather as a recovery mechanism when described as pleasure, indulgence or delight and many different experiences of taste. The DRAMMA dimensions seem not to comprise these experiences. From reading the episodes, however, it became clear how much these culinary experiences added to the person's feeling of recovery. In a similar vein, enjoying the beauty of landscapes and nature and the experience of aesthetics was a recurrent theme that we felt should be mentioned. Moreover, humor was referred to rather often when persons described

how they benefited from their vacation (or evening) in terms of well-being and recovery. Also, music and culture as recovery experiences seemed important recovery mechanisms. These experiences may be categorized as detachment, relaxation or affiliation, but they may also represent separate categories. These issues are worth analyzing in more depth in future research.

Implications for Theory and Practice

Our study was one of the first to examine the validity of the entire DRAMMA model in one comprehensive experimental study. Qualitative and quantitative analysis of positive written reminiscence demonstrated that the assumed elements of DRAMMA can be identified in the memories people recollected. Particularly memories including affiliation and autonomy seemed to support recovery from strain and to lower fatigue. So, in planning one's free time (i.e., vacations and evenings), it may be worth to think of ways to increase particularly these experiences. In addition, the qualitative analyses showed several interesting recovery mechanisms that deserve more research attention.

The results also underscore the potential of positive reminiscence to ameliorate the negative impact of (job) stress on fatigue. There is ample evidence that reflecting on positive autobiographical experiences can repair negative mood and people tend to naturally use strategies to improve their mood (e.g., Clauss et al., 2016). Interventions at universities or at work places could teach people to make use of these strategies more often and in a more structured way to benefit their well-being and counteract stress.

The qualitative data analysis showed that persons often describe activities with regard to socializing, cooking and eating, and relaxing. Vacation episodes contained more activities in nature and sportive activities than evening episodes. These findings provide information about what persons describe when they reminisce on a vacation or nice evening. Future studies might look more closely into these activities and examine what constitutes "golden moments" of vacations and how they contribute to recovery processes.

Knowledge on the effects of leisure time and possibilities to increase its positive impact on employee's health, well-being and job performance is of great societal relevance. However, different stakeholders may sometimes have conflicting interests. For instance, it may be particularly problematic if employers try to impose certain leisure activities or experiences on employees with the aim to increase their productivity, permeating even the most private spheres of life. Employees may also feel pressured for self-optimization and may consequently lose pleasure in their free time if they mindlessly strive for an optimum of DRAMMA. First and foremost, rest, leisure and holidays constitute basic human rights (United Nations, Universal Declaration of Human Rights in 1948).

Last but not least, it is very important to prevent job stress from building up. A long annual vacation can by no means compensate chronic imbalance between work and free time. Job stress is seldom a problem of individual workers. Accordingly, the responsibility to reduce stress and its detrimental impact on well-being is a shared one between state legislation, employers and employees. At the very base of occupational health lie well-designed jobs which include frequent breaks, reasonable work hours, meaningful and challenging tasks. In addition, a favorable organizational climate and well-trained supervisors who serve as role models can support family friendly work arrangements, a healthy balance between work and non-work time on an everyday basis (e.g., Hächler, Pereira, & Achim, 2017; Koch & Binnewies, 2015; Semmer, 2006).

Limitations

This experiment in a controlled laboratory setting enabled us to isolate the influence of vacation reminiscence on strain recovery by comparing it to other positive memories. However, the study also has several limitations. Firstly, as the sample included mostly female university students, the findings are not directly generalizable to the general population. Different populations may have different values and ideas about leisure, which may affect the outcomes of this experiment. The results of this study should therefore only be considered

within the context of the study and replications in more diverse and larger samples are highly recommended.

Secondly, this study did not include a “neutral” control group. As it is well-established that positive memories improve well-being, we wanted to show the incremental benefit of vacation reminiscence as one specific type of positive memories. However, there were only few differences between the two reminiscence groups. Future studies could include different and more neutral control groups which reflect on neutral events or get no instructions on reminiscence at all.

Thirdly, the timing of the study was somewhat problematic. Most of the sample (80%) was first-year student and had just started to study. For many students, this meant moving out from the parental home and starting a new, independent life in a different city. This is a life-changing event for most people. Consequently, many evening memories were related to finding new friends and reconnecting with old friends while visiting or calling home. Therefore, the evening memories were not the neutral control condition we hoped for. We also tested whether the results were different between the first-year and the non-first year students. For the first-year students, there was a trend for the evening and vacation memories to be more similar than for the non-first year students. However, the differences were not significant, presumably due to the small sample size.

Conclusions and Future Outlook

Applying a needs perspective, future research could establish how need satisfaction during work relates to need satisfaction during leisure time. Van Hooff and Geurts (2015) have shown that need satisfaction at work lowers employees’ need for recovery at the end of the day and buffers the adverse impact of work pressure on people’s well-being (i.e., low fatigue, high vigor). Continuing this line of research, it would be very informative to study whether need satisfaction during and after work operate complementary or compensatory. A complementary relationship implies reciprocal reinforcement of need satisfaction. Put simply,

this means that workers who do not satisfy certain needs during the working day may also have a hard time to find satisfaction of these needs after leaving work. If the relationship is compensatory, unmet needs in one life domain can be compensated by need fulfillment in the other domain (Berg, Grant, & Johnson, 2010; Hewett et al., 2017). As a third option, it could also be that need satisfaction at work and outside work are independent from each other and that persons vary greatly in the type of needs they appreciate and aim to fulfill (e.g., Chick & Hood, 1996). Recently, it has been suggested that it would be useful to distinguish between need satisfaction and need frustration. Whereas unmet needs are associated with a failure for human growth, need frustration is related to ill-being (Chen et al., 2015).

Another promising avenue for future research and theorizing in recovery from work stress is the integration of self-regulation, defined as an individual's ability to control and regulate impulses (Muraven & Baumeister, 2000). According to Hockey (2013), fatigue emerges if people are unwilling to invest effort in their work. Rather than an outcome or an inability to invest effort, fatigue may be seen as a functional emotion which drives behavior and which makes people aware of neglected needs and alternative goals. In theorizing about recovery, we may need to focus more on the notion that recovery is a "dynamic and ongoing process" (Zijlstra, Cropley, & Rydstedt, 2014, p. 244), particularly if we study knowledge work. Up- and down-regulation of energetic resources may be needed to perform well and keep well-being levels high in mentally demanding work situations (Mackey & Perrewé, 2014).

Future research on work and recovery from work could benefit from taking the satisfaction of psychological needs in different spheres of life into account. Proactive, self-initiated and goal-oriented behaviors to satisfy psychological needs such work-life balance crafting (Sturges, 2012) and leisure crafting, which we define as an employee's proactive pursuit and enactment of leisure activities targeted at detachment, relaxation, autonomy, mastery, meaning, and affiliation, deserve a place on the research agenda. A needs perspective may enrich our current understanding of the interface of work and leisure and render new insights

which are relevant for practice as well.

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Table 1: Factor loadings and alpha's for DRAMMA need satisfaction in vacation memories

Item "In the situation, I have just written down..."	Detachment	Relaxation	Autonomy	Mastery	Meaning	Affiliation
I forgot about unpleasant duties and work tasks.	.79 (.05)					
I distanced myself from unpleasant duties and work tasks.	.82 (.05)					
I gained distance from the demands of work.	.86 (.04)					
I kicked back and relaxed.		.95(.03)				
I did relaxing things.		.82 (.04)				
I used the time to relax.		.70 (.06)				
I felt free to express my ideas and opinions.			.83 (.06)			
I felt like I am free to decide what to do.			.67 (.08)			
There were many opportunities for me to decide for myself how to do things in			.52 (.09)			
I learned new things.				.95 (.04)		
I did things that challenge me.				.58 (.08)		
I did something to broaden my horizons.				.90 (.04)		
I did something that was important to me.					.95 (.04)	
I have done something meaningful.					.58 (.08)	
I did something that was important to me personally.					.90 (.04)	
I consider the people I interacted with to be my friends.						.75 (.06)
I felt close to the people I was interacting with.						.96 (.04)
the people I interacted with paid attention how I feel.						.70 (.06)
Cronbach's alpha	.86	.86	.72	.75	.84	.84

Table 2: Zero-order correlations between study variables

Item	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	20.59	2.01	-.15											
2. Gender	0.87	0.34	-.12	.09										
3. Education level	1.05	0.21	.10	-.12										
4. Detachment	4.01	0.93	.13	.05	-.26*	(.86)								
5. Relaxation	4.06	0.94	-.13	.11	-.19	.50**	(.86)							
6. Autonomy	4.09	0.67	-.07	.06	.05	.40**	.48**	(.72)						
7. Mastery	3.07	1.00	.04	.08	.13	-.05	.05	-.03	(.75)					
8. Meaning	3.71	0.98	.08	-.07	.03	.01	.13	.02	.35**	(.84)				
9. Affiliation	4.10	0.60	.11	-.22*	-.01	.13	.28**	.08	-.07	-.10	(.84)			
10. Fatigue T1	1.97	0.93	-.03	-.09	-.07	-.04	-.23*	-.35**	.12	.08	-.08	(.92)		
11. Fatigue T2	2.68	1.11	.00	-.18	.05	.00	-.18	-.13	.01	.07	-.13	.63**	(.90)	
12. Fatigue T3	2.07	0.98	-.15	.09	-.02	-.08	-.19	-.31**	.13	.14	-.25*	.69**	.76**	(.88)

Notes: * = significant at $p < .05$. ** = significant at $p < .01$. Gender: 0 = male, 1 = female. Education: 1 = Bachelor, 2 = Master. T1 = baseline before experiment, T2 = measured after demanding task, T3 = measured after intervention (holiday or evening reminiscence).

Table 3: Differences in means between experimental and control group - self-reported

	Experimental group (N = 44)	Control group (N = 41)	<i>F, p</i>
Detachment	3.92	4.10	0.74, 0.39
Relaxation	3.97	4.16	0.89, .35
Autonomy	4.16	4.02	0.86, 0.36
Mastery	3.22	2.92	1.94, 0.17
Meaning	4.04	3.37	11.19, .001**
Affiliation	3.70	4.54	81.35, .001**
Fatigue T1	1.92	2.02	0.28, 0.60
Fatigue T2	2.73	2.63	0.15, 0.70
Fatigue T3	2.21	1.93	1.84, 0.18

Note: ** = difference between experimental group and control group significant at $p < .01$

Table 4. Multiple Regression Analysis for Fatigue and DRAMMA ($N = 85$)

Fatigue T3				
Predictor Variables	<i>B</i>	<i>SE</i>	β	ΔR^2
Control variables				.59***
Age	-.01	.03	-.02	
Gender ^a	-.34	.20	-.12	
Education level	-.17	.33	-.04	
Fatigue T2	.63	.06	.71***	
DRAMMA	-.04			.09**
Detachment	-.04	.09	-.04	
Relaxation	.11	.09	.11	
Autonomy	-.33	.12	-.23**	
Mastery	.09	.07	.09	
Meaning	.05	.07	.05	
Affiliation	-.26	.12	-.16*	
Total R^2				.67

* = significant at $p < .05$. ** = significant at $p < .01$. *** = significant at $p < .001$.

Table 5. Experiences and activities mentioned in the written memory recollections –
externally evaluated by three raters

Experiences	% within all texts (N=85)	% within experimental group (N=44)	% within control group (N=41)	χ^2, p
Affiliation	95.3	93.2	97.6	0.91, .62
Culinary	80.0	72.7	87.8	3.02, .11
Relaxation	57.5	61.4	53.7	0.52, .52
Aesthetics	42.4	56.8	26.8	7.82, .01*
Meaning	38.8	31.8	46.3	1.89, .19
Humor	37.6	43.2	31.7	1.19, .37
Mastery	30.6	34.1	26.8	0.53, .49
Detachment	25.9	27.3	24.4	0.10, .81
Music	22.4	18.6	26.8	0.91, .44
Autonomy	20.0	29.5	9.8	5.20, .03*
Cultural	14.1	13.6	14.6	0.02, .99
Activities				
Socializing	75.3	72.7	78.0	0.42, .61
Cooking & eating	70.6	65.9	75.6	0.96, .35
Relaxing	34.1	34.1	34.1	.97, .62
Nature	35.3	47.7	22.0	6.18, .02*
Low-intensity sports	34.1	47.7	19.5	7.72, .01*
Listening to music	24.7	20.5	29.3	0.89, .45
Entertainment	23.5	13.6	34.1	4.96, .04*
Adventurous activities	20.0	27.3	12.2	3.02, .11
Romance	17.6	13.6	22.0	1.01, .40
Reading	5.9	11.4	0.0	4.95, .03*
Shopping	14.1	20.5	7.3	3.02, .12
High-intensity sports	12.9	20.5	4.9	4.57, .03*

* = difference between experimental group and control group significant at $p < .05$.