

LATVIJAS UNIVERSITĀTE
PEDAGOĢIJAS, PSIHOĢIJAS UN MĀKSLAS
FAKULTĀTE
PSIHOĢIJAS NODAĻA

AVIATION CREW RECOVERY EXPERIENCES
ON OUTSTATIONS

MAGISTRA DARBS

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RĪGA 2015

ACMI apkalpes pavada ievērojamu laiku prom no mājām, kamēr strādā bāzēs ārpus dzimtenes. Šis pētījums parāda, ka šāda veida ilglaicīga uzturēšanās prasa īpašu pieeju darbinieku atpūtai, izmantojot ICAO ieteiktos Noguruma Riska Vadības praktiskos paņēmienus. Četras reģenerācijas pieredzes, darba nošķiršana no privātās dzīves, kontrole, relaksācija un meistarība – šīs uzvedības tika identificētas un korelēja ar 28 apkalpes locekļiem esot bāzē. Rezultāti parāda, ka aviācijas vadībai ir nepieciešams ieviest uzlabojumus līgumos ar ACMI apkalpēm, respektīvi, nodrošināt grafika stabilitāti, tādā veidā veicinot darbinieku kontroles sajūtu.

Atslēgas vārdi: nogurums, darba prasības, darba resursi, reģenerācijas pieredzes, aviācijas apkalpes

ACMI flight crews spend considerable time away from home on outstations. This study suggests that this long term stay carries its own considerations in regards to rest recovery with practical implications for Fatigue Risk Management as prescribed by ICAO. Four recovery experiences, Work Detachment, Control, Relaxation and Mastery, are identified and correlated with 28 crew behaviors on base. The results indicate improvement considerations for airline management organizing a long term contract with ACMI crews, in particular to increase schedule stability to improve the crew member's sense of Control.

Keywords: Fatigue, Job Demands, Job Resources, Recovery Experiences, Aviation Crew

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INTRODUCTION

ACMI operators and the ICAO Regulatory Framework

All airlines must work by the agreed rule sets of the International Civil Aviation Organization (ICAO), published in 19 annexes. This is the framework by which all airlines operate, further enhanced by regional regulations (e.g. the European Aviation Safety Agency) and local authority requirements (e.g. the National Civil Aviation Agency).

There is, though, an underlying assumption to the ICAO rule sets, they implicitly assume that the airline operators operate on a fairly steady schedule from a fairly limited number of destinations. Most airlines have central hubs, airports from which they operate a number of flights to destination airports before returning back to the hub. There are variations of this setup but this is the way the industry has mainly operated since its inception in the 1920s. Like bus and train routes, the flights were organized according to specific market requirements and available destinations.

Those airlines that did not operate according to this fairly rigid system, found themselves sometimes at odds with regulations that didn't account for a different business model. ACMI operators are airlines that provide other airlines with Aircraft, Crew, Maintenance and Insurance, hence the abbreviated name. These are business to business (B2B) operators, providing other airlines with aircraft capacity in times of shortage, e.g. if an airline has an offer to fly tourists from point A to point B but doesn't have any available aircraft. The airline then contacts the ACMI operator who operates the route under the name of the original airline. The aircraft may even be fully liveried in the customer colors, the average passenger would never notice any difference.

These airlines, however, do not have the luxury of preplanning and establishing a permanent hub. The contracts are usually short term and only last a few months, maybe a few

years on the outside. The crews are hired to be based on the operating base and have to spend the duration of the contract in airport hotels. A life not as exciting as it might sound. Turnover of crews is kept to a minimum to save costs so each crew member may have to make himself a make-shift home in the hotel.

The effects of Fatigue on Crew Performance

It is hard to overstate how much of a safety risk fatigue poses to the aviation industry. Crew members suffering from fatigue exhibit a number of physical, mental and emotional symptoms who most or all are detrimental to the safety of the flight (Avers & Johnson, 2011).

Table 1.

Physical, mental and emotional symptoms of fatigue

Physical Symptoms	Mental Symptoms	Emotional Symptoms
Slowed reaction time	Concentration difficulty	Quiet and withdrawn
Lack of energy, weakness.	Attention lapses	Lack of motivation
Repeated yawning	Communication problems	Irritability
Heavy eyelids	Failure to anticipate events	Low morale
Eye rubbing	Making mistakes on routine tasks	Emotional sensitivity
Nodding off	Forgetfulness	
Microsleeps	Difficulty thinking clearly	
Headaches, nausea	Poor decision making	

In order to combat this risk to aviation, ICAO has prescribed that airlines and other aviation related operators implement and rely on Fatigue Risk Management.

Fatigue Risk Management

ICAO's Fatigue Risk Management rules, located in ICAO Annex 6, focus mainly on the responsibility of the airline to analyze their schedule so that hazardous working hours may be identified and mitigated.

However, in accordance with chapter 4.10 in ICAO Annex 6, airlines are to implement a fatigue risk management system (FRMS) as prescribed by each state requirements, who should be in accordance to ICAO document 9966, *Fatigue Risk Management for Regulators*. The FRMS should be based on providing multiple redundant defenses against fatigue related risks. One major component of an FRMS is the focus on the production of flight crew duty schedules. They should not overly tax the crew member and increase the level of fatigue unduly (Gander, Hartley, et al, 2011).

The second major component of an FRMS is the training and education for crews, focused on their own responsibility to maximize the amount of sleep obtained immediately prior to flights, identifying circumstances where the likelihood of fatigue is elevated, and managing the risks associated with fatigue related impairment (Gander, Hartley, et al, 2011).

If a flight duty schedule is analyzed to be too taxing, it is therefore incumbent on the airline to find ways to ensure that high levels of fatigue do not take place and distribute the duties amongst more crews, thus lightening the load. As FRMS pertains to the individual crew member, there is still the implicit assumption that the crew member gets to rest at his home base, at his home residence where he can fall back into his familiar rest routine. This does not, however, apply to the ACMI crew which have to return to their airport hotel, socialize with their colleagues and be constantly surrounded with work reminders.

It can be said that the FRMS is a two-way street. While the airline is responsible to minimize the risk of fatigue in their scheduling, it is also the responsibility of the crew member to ensure that he maximizes his rest potential during his off hours. Every crew member is obligated to evaluate his fitness to fly and report himself unfit to fly if he is tired, sick or otherwise incapacitated. There is a risk though that while it is easy to identify sudden fatigue, maybe due to emergency work hours, sudden insomnia or sickness; it may be more difficult for the crewmember to accurately assess his own fatigue if it has been slowly deteriorating over time (Gander, Hartley, et al, 2011).

Accumulated fatigue

Most fatigue research has been conducted on the immediate fatigue, i.e. fatigue that takes place after a very taxing or prolonged duty, but there has been a shift of attention to the idea of accumulated fatigue, or fatigue that gradually builds across duty periods (Avers & Johnson, 2011). The intent of Fatigue Risk Management is to identify when there is a risk of accumulated fatigue, however crews on outstations face a vastly different rest environment than the one that is addressed in the ICAO rulebook.

Currently ICAO addresses accumulated fatigue by setting limits on the number of duty hours in a certain period of time, which is considered the bare minimum as a fatigue combatting measure (Gander, Hartley, et al, 2011). It bears noting that ICAO does not make there a distinction between duty on crews on home bases and crews actually stationed long-term away from home.

ICAO also encourages fatigue reporting when a crewmember self-diagnoses himself as being too fatigued to operate. There are clear rules that no punitive actions should be taken by the airline to the crewmember but in reality, there is a great hesitancy for crews to disrupt airline operations, which can be very costly, especially when other standby crews may not be available. Good intentions aside, there is the possibility that crews fear repercussions if they are not being supported by strict regulatory requirements. It may be difficult to report accumulated fatigue when there are no direct and well defined scheduling causes visible in the system.

Job Demands – Resources Model

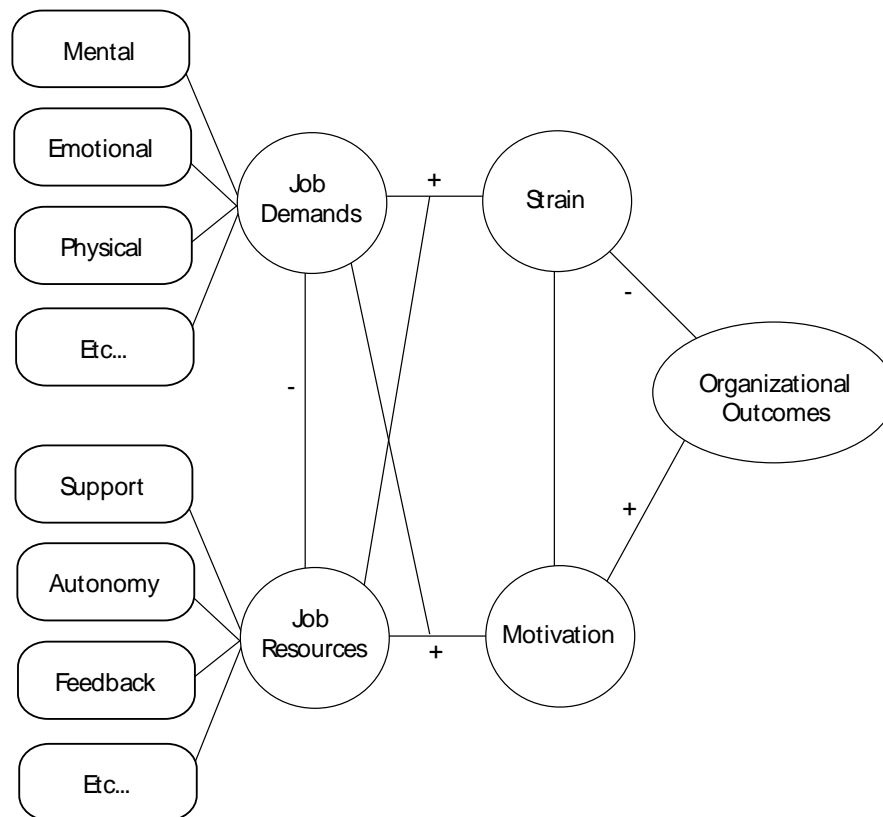
The Job Demands – Resources (JD-R) Model describes the interaction between job demands and job resources and how it influences the well-being of the employee (Bakker & Demerouti, 2007). The model is careful in describing that while every job is unique in the sources of employee well-being (or lack of), it is possible to classify them all in terms of the struggle between job demands and job resources (Bakker & Demerouti, 2007). The medical profession, e.g. doctors and nurses, may experience a great deal of emotional demands but

other professions may experience that mental demands play a higher role in their work (e.g. Air traffic controllers, computer programmers).

Job demands are described as those physical, psychological, social or organizational aspects of any job that require effort or any other psychological or physiological cost.

Job resources are the more positive aspects of the job that refer to the physical, psychological, social or organizational aspects of the job that aid towards achieving work goals, reduce job demands, and stimulate personal growth, learning and development. This is usually seen as adequate monetary compensation, work autonomy and sufficient support and feedback from management. Again it must be emphasized that each profession has their own unique sets of job demands and job resources.

These two factors interact via two different underlying psychological processes that have their effect on performance and well-being of the employee (Bakker & Demerouti, 2007).



Picture 1. Job Demand/Resources Model

The negative result of this interaction is called strain (Bakker & Demerouti, 2007). Strain is the process where the demands prove to be too high for the available employee resources and the cost of the task becomes so great that the employee starts performing in a degraded manner. This can be evident as compensatory costs (e.g. increased effort and constant activation), strategy adjustments (e.g. attention narrowing) and fatigue after-effects (e.g. bad decision making) (Hockey, 1993). If allowed to go unchecked, this can lead to an eventual breakdown for the employee (Hockey, 1993).

The second process is motivational, stating that certain job aspects may foster employee growth and competence, i.e. autonomy at work, good managerial feedback, social support and learning opportunities (Bakker & Demerouti, 2007). If job resources remain high, after the interaction with job demands, this could lead to increased work motivation which would lead to better organizational outcomes.

Recovery refers to the process by which employees return to their normal non-work level and in which strain is reduced. It has also been defined as a process that allows individuals to replenish their resources (Bakker & Demerouti, 2007).

Recovery is, though, not simply a respite from work. It is a rebuilding of resources via various factors (Sonnentag & Fritz, 2007). In particular, this is important for sleep. Positive recovery experiences are expected to reduce the strain accumulated over the day and enhance sleep quality. Lack of these recovery experiences may, on the other hand, adversely affect sleep quality and sleep onset (Sonnentag & Fritz, 2007), something extremely important to Fatigue Management. If recovery is insufficient, this may lead to extra strain during work and lead to health issues (Meijman & Mulder, 1998). Recovery thus acts as a buffer, either by reducing strain or by replenishing resources.

Some research has been conducted on the Job Demands – Resources model as it relates to crew safety behavior (Chen & Chen, 2014, Kao, Stewart, & Lee, 2009). It was found that when job demands were high, safety behavior decreased and if resources were perceived to be greater, safety behavior increased (Chen & Chen, 2014). Recovery plays there an important role as it increases internal resources and aids them to cope with the job demands (Sonnentag & Fritz, 2007).

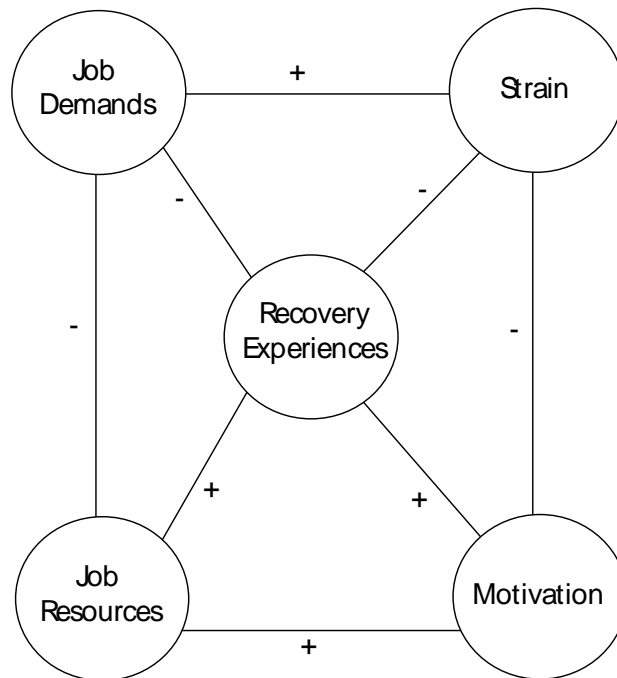
Crew Recovery

Benjamin Searle (2012) raised the question if airline crew members are perhaps unable to fully utilize their rest periods while staying in airport hotels, particularly if the stay is somewhat extensive. This would possibly lead to insufficient recovery and thus to fatigue in the long run. It has been shown that people that are highly immersed in their work while off duty, experience higher fatigue levels, even higher than those with great work demands (Akerstedt, et al, 2004). Crews spending all their times at airport hotels are perhaps, by definition, always immersed in their work or work environment. This constant immersion may therefore be detrimental to the quality of their rest. This would apply double to the ACMI crews who do not return to their homes for months at a time.

The research of Sonnentag & Fritz (2007) on recovery is quite relevant to this question. Sonnentag & Fritz (2007) builds on the Effort-Recovery Model by Meijman & Mulder, (1998) and the Conservation of Resources Theory by Hobfoll (1998). Recovery would thus consist of a two complementary processes.

1. To refrain from work demands and to avoid activities that call upon the same functional systems or internal resources as those required at work.
2. Gaining new internal resources such as energy, self-efficacy or positive mood can help restore threatened resources.

Sonnentag & Fritz (2007) have identified four mechanisms that influence recovery: detachment, mastery, relaxation, and control. These mechanisms can be seen as personal mitigation strategies to restore or maintain resources and health.



Picture 2. Job Demand/Resources Model with Recovery Experiences as Mediators

Work Detachment is the ability to distance yourself from the work environment, visual cues, reminders and associated thoughts. This includes phone calls, emails and any other job related activities. This goes beyond being simply removed from the work place – it means being able to switch off mentally and not call on any resources for job related tasks. This would enable recovery to take place according to the Effort-Recovery Model (Meijman & Mulder, 1998). If the individual keeps on thinking about his work issues, his functional systems are constantly in a state of activation and no recovery can take place. Sonnentag & Fritz (2007) showed evidence that this detachment was negatively related to need for recovery, sleep problems, emotional exhaustion and health complaints.

There is also some empirical data that work detachment is related to recovery from stress, i.e. being able to not think about work reduces stress and increases the chances to rebuild internal resources (Etzion, et al, 2004).

This factor is measured by the following questions:

1. I forget about work
2. I don't think about work at all.
3. I distance myself from work.

4. I get a break from the demands of work

Mastery is the ability to engross yourself in the task of self-betterment, of mastering a task, skill or ability. It seems contradictory to talk about Mastery as a recovery aid as it can be challenging and taxing to the individual, thus there is a possibility of exhausting the existing resources. Mastery, however, enables feelings of competence and having increased resources (Sonnentag & Fritz, 2007). Furthermore, Mastery has been negatively related to emotional exhaustion, need for recovery and depressive symptoms (Sonnentag & Fritz, 2007).

This factor is measured by the following questions.

1. I learn new things.
2. I seek out intellectual challenges.
3. I do things that challenge me.
4. I do something to broaden my horizons.

Relaxation is the state of low activity and increased positive affect. This is important as it signifies the ability to take a break from work demands. The inability to take relaxation has been linked to negative affect and health (Sonnentag & Fritz, 2007). By raising the positive affect, job stress effects may be reduced (Van der Klink, Blonk, Schene & Van Djik, 2001).

This factor is measured by the following questions:

1. I kick back and relax.
2. I do relaxing things.
3. I use the time to relax.
4. I take time for leisure.

Control is the extent of which the employee has influence on his leisure time, what activity to pursue, the timing of it and how best to perform it. Personal control has been shown to have a positive effect on individual well-being (Bandura, 1997). Sonnentag & Fritz (2007) found that Control was negatively related to emotional exhaustion, depressive symptoms, need for recovery and sleep problems.

This factor is measured by the following questions:

1. I feel like I can decide for myself what to do.
2. I decide my own schedule.
3. I determine for myself how I will spend my time.
4. I take care of things the way I want them done.

In the case of outstation crews, there may be little possibility for them to exert any control on the timing of their leisure time as the schedules are controlled by their managers. To add to the complication, crews are often required to be on standby for extended periods thus lessening their ability to control their own leisure time. Being on standby means that the crew members are assigned a period to be available for immediate duty – if no duty is assigned, then they receive 12 hours mandatory rest. If, however, duty is assigned, they might go on extended flight, return 14 hours later to base and then get 14 hours rest. To add to the standby complication – sometimes an extended flight might take the crew member away from base for days at a time – effectively nullifying the schedule for the remainder of the month as it has to be completely restructured. It can easily be seen how a schedule with many standbys may be very disruptive to crews planning their personal life during off hours.

Recovery and the Crew Member

Crews can however try to seek detachment by minimizing socialization with work colleagues and avoid work related environment. In reality, the close proximity of all work members at the hotel accommodation means that every breakfast, every dinner, every gym visit, will mean a potential work encounter with colleagues. In addition, crew members are informed daily about their schedule changes, timing changes and are required to check their emails and SMS messages on a regular basis. Those are all constant reminders of their work duties and the fact that they can be called back to duty at a minimum notice.

They can seek mastery through gym attendance, reading or otherwise any avenue of self-improvement. The internet provides countless opportunities of distance learning.

Relaxation facilities are very much prevalent in most hotels and those crew members wishing to maximize that factor should not have any trouble finding the facilities to do so.

The only question is if they have enough time between flights to actively and effectively seek relaxation.

Sonnentag & Fritz (2007) found moderate relationships between these recovery experiences and well-being measurements. Psychological Work Detachment and Control, had negative relationship with health complaints, emotional exhaustion, depressive symptoms, need for recovery and sleep problems. Relaxation had negative relationship with health problems, emotional exhaustion, need for recovery and sleep problems. Mastery was negatively related to depressive symptoms, emotional exhaustion and need for recovery. All four factors had positive relationship with life satisfaction.

Perhaps more relevantly, Kinnunen, Feldt, Siltaloppi & Sonnentag (2011) directly tested the effects of these mechanisms on the JD-R model and found that Work Detachment had a negative relationship with work fatigue and Mastery had a positive relationship with work engagement. Relaxation and Control were not found to have any significant relationships with neither fatigue nor work engagement.

Furthermore, Sonnentag & Natter (2004) did some research on cabin crew rest and found no significant detrimental effect of hotel stays but the study only measured a few day's length of stay and did not investigate the effects of longer term stays. Staying in a hotel for a few days is a different experience from having to make it a temporary home for months.

To further Benjamin Searles (2012) questions in regards to flight crews possible inability to fully recover while on outstations, this relationship can be elaborated on by investigating further the actual behavior of flight crews on base, the connection between those behaviors to the four factors identified by Sonnentag & Fritz (2007) and then seek confirmation on whether or not these factors significantly affect levels of fatigue.

This study aims to identify crew behavior on outstation bases that have a significant relationship with positive recovery experiences in accordance with Sonnentag & Fritz (2007) recovery model.

METHOD

Participants

The survey of 54 questions was submitted to a group of aviation professionals from a mid-size European airline. These were crew members actively operating on projects worldwide (N=186). Response was received from 102 participants or 55% response rate. The distribution was roughly half professional pilots and the other half professional cabin crew. There is some age discrepancy between the groups with the cabin crews being considerably younger than the pilots.

Materials and Procedure

The questionnaire consisted of Sonnentag & Fritz (2007) Recovery Experience Questionnaire which measures:

- (W) Work Detachment, (e.g. I distance myself from work.)
- (M) Mastery, (e.g. I seek out intellectual challenges.)
- (C) Control, (e.g. I determine for myself how I will spend my time.)
- (R) Relaxation, (e.g. I take time for leisure.)

This is a 16 question survey addressed to their experience during off work hours, e.g. “ON BASE, DURING TIME AFTER MY WORK: I DON’T THINK ABOUT WORK AT ALL”. These are answered on a 5 point scale, from 1 (I do not agree at all) to 5 (I fully agree).

Focus Group

The second part of the questionnaire consisted of specific behavioral questions derived from a specialized focus group. The group consisted of eight experienced professionals in the aviation field who identified crew behaviors that may facilitate or impede the four factors identified by Sonnentag (2007). The focus group consisted of three pilots, three senior cabin

crew members and two station managers. Each focus group member had at least 6 years of work experience and had worked on outstation projects on at least 5 occasions.

Table 2.

Behavior	Connection to Recovery Factor
Crew member schedules breakfast with other crewmembers.	WD
Crew member finds a “secret” place away from hotel, only to enjoy for him/herself.	WD
Crew member sets up a training regime in the hotel gym.	M
Crew member attends a crew party near every night when off duty.	WD
Crew member stays in room and avoids contact with colleagues during off duty days.	WD
Crew member actively explores the region in which he/she is based.	C
Crew member uses off time to further education or training.	M
Crew member joins other like-minded colleagues for activities away from hotel.	WD
Crew member rents a car to travel more extensively while on off days.	WD
Crew member attends dinners with colleagues most all nights.	WD
Crew member attends the swimming pool (if available) near every day.	R
Crew member goes to the nearby beach (if available) on a regular basis.	R
Crew member goes out on the nightlife when on off duty nights.	WD
Crew member goes sightseeing alone.	WD
Crew member catches up on reading during off hours.	M
Crew member starts drinking more than usual during off hours.	C
Crew member regularly contacts family at home via telephone or video chat.	WD
Crew member uses medication to regulate sleeping patterns.	C
Crew member swaps duties with other crew members in order to organize his off day activities.	C
Crew member does some shopping during off duty hours (retail therapy).	C
Crew member tries actively to meet new people away from work.	WD
Crew member plays computer games in his/her hotel room during off duty hours.	R
Crew member watches TV-shows or movies in his/her hotel room during off duty hours.	R
Crew member is unable to schedule off time duty due to schedule instability.	C
Crew member experiences homesickness.	WD
Crew member arranges for his family to join him/her on base for some extended period of time.	WD
Crew member immerses him/herself in a hobby during off hours.	M
Crew member personalizes their hotel room (e.g. photographs on stands, moving/removing furniture).	C

Identified Crew Behavior on Outstations

WD:Work Detachment, M: Mastery, C: Control, R: Relaxation

The focus group members were briefed on the concepts of Work Detachment, Mastery, Relaxation and Control as described by Sonnentag & Fritz (2007) and subsequently asked to identify what regular behavior they have observed or performed themselves on outstations that might facilitate or hinder these four factors. The result of the focus group was compiled into a questionnaire along with Sonnentag & Fritz (2007) Recovery Experience questionnaire to measure those behaviors among actual crewmembers currently on outstations.

Distribution

The questionnaire was distributed in electronic format to crews on all operating bases. All participation was anonymous.

The bases available were:

Pristina, Budapest, Brussels, Prague, London, Cardiff, Birmingham, Antalya, Istanbul and Madrid.

Measures

Regression analysis was performed on the four Recovery Factors: Work detachment, Control, Relaxation and Mastery, in order to determine the predictive validity of the focus group identified behaviors to these factors, thus trying to obtain a better resolution on how the behavior on base can predict the factor scores. The scores of the four factors are valuable in themselves but the added detail of the identified behaviors will improve the overall picture of crew behavior and its effect on crew recovery.

There are three fatigue self-reporting questions in the questionnaire which will serve as an indicator on a relationship between the factors and fatigue, and/or between certain behavior patterns on fatigue.

RESULTS

Background variables

The division of the genders was a bit uneven with 62% of the participants being male and 38% women. The age distribution skewed young, with 48% being between the ages of 21-31 and another 30% being between the ages of 32-40. That gives us a group of participants where the experienced crew over the age of 40 were only 22% of the group.

The company experiences quite a bit of employee turnover as can be seen in the fact that 83% of the participants had been less than five years with the company.

The participants were equally represented with almost the equal number of participants from Captains, First Officers, Senior Cabin Crew Members and Cabin Crew Members alike.

Table 3.
Gender distribution of Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	39	38.2	38.2	38.2
	Male	63	61.8	61.8	100.0
	Total	102	100.0	100.0	

Table 4.

Age Distribution of Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-31	49	48.0	48.0	51.0
	32-40	31	30.4	30.4	81.4
	41-50	9	8.8	8.8	90.2
	51-60	10	9.8	9.8	100.0
	>60	3	2.9	2.9	2.9
	Total	102	100.0	100.0	

Table 5.

Participant Years with Company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<1 yr	17	16.7	16.7	16.7
	1-5 yrs	60	58.8	58.8	83.3
	6-10 yrs	17	16.7	16.7	100.0
	>10 yrs	8	7.8	7.8	24.5
	Total	102	100.0	100.0	

Table 6.

Participant Job Position

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Captain	24	23.5	23.5	23.5
CCM	20	19.6	19.6	43.1
First Officer	28	27.5	27.5	70.6
Other	5	4.9	4.9	75.5
SCCM	25	24.5	24.5	100.0
Total	102	100.0	100.0	

The four factors were established by the average of the factor question scores from 1 to 5. This group of participants showed lower score of Work Detachment than the general populace as measured in Sonnentag & Fritz (2007) but higher scores in Relaxation, Mastery and somewhat surprisingly, Control. This might indicate that the participants might indeed have a harder time detaching from their work than other workers but somewhat compensate with the other factors.

Table 7.

Recovery Experiences Scores

	Work Detach. (N=102)	Relaxation (N=102)	Control (N=102)	Mastery (N=100)
Mean	2.65	4.00	3.67	3.86
Std. Deviation	.75	.70	.84	.58

Identified Behavior Questions

The results from the 28 identified behavior questions are presented in appendix 2. They present a fairly positive picture of crew life on base. There is no obvious indication of excessive drinking, social isolation or other general discontent.

In order to define the four factors with behavioral indicators, multiple regression analysis was performed on the factor scores with the identified behaviors from the focus group.

Recovery Experience - Relaxation

Table 8.

Multiple Regression analysis of Relaxation Score with Identified Behaviors – Model Summary

Model	R	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics		Sig. F Change	
					F Change	df1		df2
1	.25 ^a	.06	.69	.06	1.72	4	97	.15

a. Predictors: (Constant), I watch TV-shows or movies in my hotel room., I go to the swimming pool near every day (if available)., I play computer games in my hotel room., I go to the nearby beach (if available) on a regular basis.

Table 9.

**Multiple Regression analysis of Relaxation Score with Identified Behaviors -
Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.70	.32		11.61	.00
	I go to the swimming pool near every day (if available).	.05	.07	.08	.66	.50
	I go to the nearby beach (if available) on a regular basis.	.08	.08	.13	1.09	.28
	I play computer games in my hotel room.	-.08	.06	-.13	-1.30	.19
	I watch TV-shows or movies in my hotel room.	-.04	.05	-.08	-.82	.41

a. Dependent Variable: Relaxation

None of the identified behaviors had any significant relationship with the Relaxation Recovery Strategy.

Recovery Experience - Mastery

Table 10.

Multiple Regression analysis of Mastery Score with Identified Behaviors – Model Summary

Model	R	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
					F	df1	df2	
1	.58 ^a	.33	.48	.33	11.95	4	95	.000

a. Predictors: (Constant), I try to immerse myself in a hobby during my off duty hours., I catch up on my reading., I use the off time to further my education or training., I set up a training regime in the hotel gym.

Table 11.

Multiple Regression analysis of Mastery Score with Identified Behaviors - Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.82	.32		5.67	.00
	I catch up on my reading.	.07	.05	.11	1.25	.21
	I use the off time to further my education or training.	.25	.06	.35	3.90	.00
	I set up a training regime in the hotel gym.	.05	.04	.13	1.49	.13
	I try to immerse myself in a hobby during my off duty hours.	.16	.05	.26	2.94	.00

a. Dependent Variable: Mastery

The identified mastery behavior show some significant relationship with the Mastery factor. In particular the fact that they report that they use their off-duty time to further their education or training. This should perhaps not come as a much of a surprise as the field of aviation professions is full of mandatory regulatory training, all of which have to be passed if the crew members wishes to continue on their chosen career. In any year, a crew member may have to attend and pass ten separate training courses. In addition, every operating flight is started with a pre-flight briefing which can resemble a training test. It is therefore understandable and perhaps necessary that the crewmember may wish to spend much of his time gaining mastery of his profession.

The crew members also show a significant relationship between attending their chosen hobby and Mastery.

Recovery Experience - Control

Table 12.

Multiple Regression analysis of Control Score with Identified Behaviors – Model Summary^a

Model	R	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
					F	df1	df2	
1	.49 ^a	.24	.76	.24	4.2	7	93	.00

a. Predictors: (Constant), I try to personalize my hotel room for the duration of my stay (e.g. photographs, art, moving furniture)., I do some shopping in order to pass the time., I use medication to control my sleep., I cannot schedule my off time due to schedule instability., I tend to drink more than usual during my off hours on base., I actively explore the region around the hotel., I try to swap duties with other crew members in order to organize my off day activities.

Table 13.

Multiple Regression analysis of Control Score with Identified Behaviors - Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.47	.55		8.10	.00
	I actively explore the region around the hotel.	.07	.09	.08	.84	.40
	I tend to drink more than usual during my off hours on base.	-.00	.07	-.00	-.01	.98
	I use medication to control my sleep.	-.20	.14	-.14	-1.44	.15
	I try to swap duties with other crew members in order to organize my off day activities.	.04	.07	.06	.61	.53
	I do some shopping in order to pass the time.	-.10	.06	-.14	-1.56	.12
	I cannot schedule my off time due to schedule instability.	-.24	.06	-.36	-3.82	.00
	I try to personalize my hotel room for the duration of my stay (e.g. photographs, art, moving furniture).	.04	.06	.07	.73	.46

a. Dependent Variable: Control

The identified behaviors for the Control Recovery Strategy were not significant except for the inability to schedule their off time due to schedule instability. That was a strong, significant, negative relationship, indicating that their lack of schedule control negatively impacted their Control Recovery Strategy score. The other identified behaviors did not have any significant relationship with the Control score.

Recovery Experience - Work Detachment

Table 14.

Multiple Regression analysis of Work Detachment Score with Identified Behaviors – Model Summary

Model	R	Adjusted R Square	Std. Error of the Estimate	Change Statistics			Sig. F Change		
				R Square Change	F Change	df1		df2	
1	.34 ^a	.12	-.01	.74	.12	.89	13	86	.55

a. Predictors: (Constant), I try to arrange for my family to join me on base for some period of time., I try to schedule having breakfast with my colleagues., I tend to experience homesickness., I sometimes rent a car to travel more extensively while on off days., I go out on the nightlife most off duty nights., I try to find an enjoyable place away from the hotel and keep it to myself., I go sightseeing alone., I contact my family at home via telephone or video chat on a regular basis., I try actively to meet new people away from work., I attend crew parties near every night when off duty., I tend to stay in my room most days and avoid contact with colleagues., I tend to join my colleagues for activities away from the hotel., I attend dinners with my colleagues most nights.

Table 15.

Multpl. Regression analysis of Work Detachment Score w. Ident. Behav. - Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	1.90	.69		2.73	.00
	I try to schedule having breakfast with my colleagues.	-.07	.08	-.11	-.87	.38
	I try to find an enjoyable place away from the hotel and keep it to myself.	.05	.07	.08	.71	.48
	I attend crew parties near every night when off duty.	.11	.08	.17	1.45	.15
	I tend to stay in my room most days and avoid contact with colleagues.	-.08	.08	-.12	-1.00	.32
	I tend to join my colleagues for activities away from the hotel.	.01	.10	.01	.12	.90
	I sometimes rent a car to travel more extensively while on off days.	.06	.06	.09	.91	.36
	I attend dinners with my colleagues most nights.	.04	.10	.05	.39	.70
	I go out on the nightlife most off duty nights.	.10	.09	.14	1.17	.24
	I go sightseeing alone.	-.02	.08	-.04	-.33	.74
	I contact my family at home via telephone or video chat on a regular basis.	.08	.08	.12	1.07	.29
	I try actively to meet new people away from work.	-.12	.08	-.17	-1.48	.14
	I tend to experience homesickness.	.05	.07	.08	.74	.46
	I try to arrange for my family to join me on base for some period of time.	.02	.05	.05	.45	.65

a. Dependent Variable: WDetachm

None of the identified behaviors behind the Work Detachment Recovery Experience showed any significant relationship to Work Detachment.

Fatigue

Fatigue was measured with the Samn-Perelli scale (Samn & Perelli, 1982) which was designed for the use of monitoring air crew fatigue and is considered somewhat of an industry standard.

The overwhelming majority, or close to 80%, reported that they did not consider themselves tired. 12.9% reported themselves to be a little tired and only 2% reported to be extremely tired.

Table 16.

Current Level of Fatigue Scores– Samn-Perelli Scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fully alert, wide awake	22	21.6	21.8	21.8
	Very lively, responsive, but not at peak	18	17.6	17.8	39.6
	Okay, somewhat fresh	40	39.2	39.6	79.2
	A little tired, less than fresh	13	12.7	12.9	92.1
	Moderately tired, let down	6	5.9	5.9	98.0
	Extremely tired, very difficult to concentrate	2	2.0	2.0	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
Total		102	100.0		

This result was supported by two additional questions who asked about the workload and rest time. 66% felt that they had received sufficient rest while 21% stayed neutral on the question. 15.7% felt that their rest had been less than required. Ideally, this number should be closer to zero in aviation.

Table 17.

Responses to the question “I feel that I have received sufficient rest this week”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	7	6.9	6.9	6.9
	I somewhat disagree	9	8.8	8.8	15.7
	Neutral	22	21.6	21.6	37.3
	I somewhat agree	30	29.4	29.4	66.7
	I fully agree	34	33.3	33.3	100.0
	Total	102	100.0	100.0	

When asked if their schedule was not too busy, 19.8% reported that it was indeed, while 80% could not agree to that statement. This is not indicative of a tired work force.

Table 18.

Responses to the question “I feel that my schedule is not too busy”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	6	5.9	5.9	5.9
	I somewhat disagree	14	13.7	13.9	19.8
	Neutral	32	31.4	31.7	51.5
	I somewhat agree	27	26.5	26.7	78.2
	I fully agree	22	21.6	21.8	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
Total		102	100.0		

Participants Comments

The survey contained one open ended question where participants were encouraged to contribute any thoughts they might have on the subject to the researcher. 19 comments were received which were 18.7% of the participants.

Those comments are presented in appendix 1 and contain elements that support the notion that life on base can be stressful. Comments such as: “*It feels like an 'off' day in outstations is not quite an 'off day' but more of a standby.*”, and “*Do not push crews to fly when they are tired.*” indicate that there are relevant fatigue and organizational issues that should be addressed within aviation.

CONCLUSION & DISCUSSION

This study aimed to find significant relationships between crew behaviors on base to the four recovery factors as identified in the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007). The goal of the study was to determine if it might be in the best interest of safety if airlines in the ACMI business try not only to focus on the duty distribution aspect of Fatigue Risk Management System, but also try to organize the setup of the outstations so that they encourage the facilitating recovery behaviors and discourage the hindering behaviors. This was especially relevant for Work Detachment and its direct connection to fatigue at work (Kinnunen, Feldt, Siltaloppi & Sonnentag, 2011).

The results were also meant to aid station managers, who always are on location and intermingle with the crews, to identify when the behavior of the crews may become negative to the efficacy of their rest. This can be added to the Fatigue Risk Management System of the airline that can implement actions to improve situation on base. The practical implications of this study was to assist airlines to facilitate certain behaviors that may increase the positive aspects of the recovery factors. Based on the research, airline management could therefore be influenced to change schedule patterns, hire different hotel accommodations or establish programs that could enable the positive experiences, e.g. giving free access to local educational courses, gym memberships, car rentals. This could minimize fatigue and prevent accumulated fatigue. Preventing fatigue increases safety – the common goal of the whole of the aviation industry.

This study found significant relationships between the identified behaviors and the Master and Control Recovery Experiences. It was unable to confirm any relationship between the identified behaviors and the Work Detachment Experience nor between the identified behaviors and the Relaxation Experience.

The significant relationships for Mastery focused mainly on the crew member behavior of studying and improving their skills, something that is quite essential for air crew who are more closely monitored and undergo more frequent training than most other

professions. The significant relationship for Control was mainly about the inability to control or predict their own work schedule.

This research did not find any significant relationship between the work detachment behaviors to the corresponding factor and there may be several reasons for that result.

The identified behaviors as were suggested by the focus group may have been too broad in their application and failed to catch the specificity of the recovery experiences, e.g. asking if a crew member goes to the swimming pool may be indicative of many behavioral markers (social, situational, financial) that are not directly connected to relaxation. The results of this survey may serve as a guidance tool for a future focus group to try to identify a more detailed and specific set of behaviors to monitor.

Furthermore, perhaps data gathering should be done via nuanced interviews. The nature of the work detachment experience may be such that participants do not fully realize how their behavior differs from the ones who are more social in nature, e.g. those who report that they do not avoid their colleagues may not know that their other colleagues have much more contact between themselves.

As suggested by Sonnentag & Fritz (2007), there may be a social dimension to the work detachment factor. Perhaps the constant interaction between employees serves a positive function and prevents the negative effects of social isolation and the possible loneliness that might follow. While not being able to detach from work is not good – social isolation in a strange place might be even worse.

Lastly, there is an issue of time spent on base. The majority of participants (72%) had spent five weeks or less on base when the survey was administrated. Given the shortage of time at full time work, it is possible that this study falls in line with the results of Sonnentag & Natter (2004) who also failed to find any negative effects of short-term hotel stay.

It may be that the work detachment only becomes important after the initial excitement of starting a new job in a new place has worn off. At least, this study can lend support to the idea that work detachment is not an issue for most employees staying five weeks or less on a new base – perhaps even longer. Meijman & Mulder (1998) state that job demands are not always necessarily negative – they only become negative job stressors if

recovery time has been insufficient for the employee. It can be argued that starting on a new base after a long time of unemployment, as was the case for these crews, gives the crew members a fairly large reservoir of job resources. This can also be seen in the lack of reported fatigue, which supports the notion that crews had not yet experienced enough work load for the four factors to act as mediators to recovery. This survey will be distributed anew to the same group of participants at the end of season, when crews have been flying for five months in a fairly heavy schedule, while living in their hotels, in order to determine if their responses have changed with the increase of fatigue.

Furthermore, it would be more beneficial, in order to coax out the interaction between these four recovery mechanisms with fatigue, to conduct the research on one base, thus controlling for the various fatigue causal factors that also impact fatigue, e.g. types of flights, timing of flights, frequency of flights, quality of hotel etc...

Subjective Comments

Even if this particular study failed to find many significant relationships between the identified behaviors and recovery experience there was a red thread throughout the open ended comments about control. As was apparent in the study, the Control factor had a strong relationship with the question about the instability of the schedule. This is strongly reflected in the comments (Appendix 1.) where there are basically no complaints about social activities or the inability to relax away from work, but there are some strong opinions on the crew's ability to control their own life when work is concluded. It may be that the inability of the crew to schedule their own life when not working simply overshadows the influence of the other three factors to recovery.

Practical implications for Airline Management

The field of aviation management is a constant struggle to balance safety vs. profitability. As the saying goes, the safest thing would be not to fly at all. Every airline manager is trained to follow the ALARP principle, to lower risk to As Low As Reasonably

Practicable. “Reasonably” being the key word. The results of this study indicate that it can be possible to improve the crew member’s sense of Control by stabilizing their schedule and ensure that crew members are able to plan their off hours in advance. This would entail some additional cost to the airline as schedule instability would then fall on the shoulders of standby crews, which would have to be hired for the purpose. The decision of the managers is to consider if this action would be reasonable within the framework of a temporary contract.

Mastery can be addressed by airline management, either by offering membership in distance learning, and by rewarding additional training courses and good training performance.

This study does however, indicate that recovery issues are not a factor in the first five weeks, a small comfort for budget conscious airline managers.

The other recovery scores did not indicate any particular area of neglect or discontent that could be addressed by airline management.

Implications for future research

The limitations of this study can be addressed as follows. Crews should participate in the survey after being subjected to a fairly long stay on base, giving all the Recovery Experiences time to establish themselves. The reality of life on base may be easy in the early weeks, but become intolerable after five months. This would be reflected in the survey results.

The identified behaviors may have to be more detailed in nature – currently some of them are quite coarse and nuanced interviews with cabin crew members on location may reveal more relevant and detailed behaviors that can be surveyed. Questions like “I go partying most nights” may not reveal the same results as the more nuanced “I feel pressured to attend crew parties”. The behavior might be the same but the underlying factor would be different. A new focus group with more detailed instructions and building on the data from this survey, might lead to a better list of identified behaviors.

Given that the work life of the ACMI crew member differs substantially from the average scheduled airline crew members, it might be beneficial to conduct a separate job

demands/resources analysis on their work. Bakker & Demerouti (2007) have designed a questionnaire specific to that purpose. If applied to the ACMI crew operator, it might highlight the work areas that require adjustments in order to increase resources and lessen the demands. There may be more immediate buffers available to the airline than those proposed by Sonnentag & Fritz (2007).

Ideally it would be possible to obtain objective fatigue data. Self-reporting fatigue scales are not considered as reliable and valid as actual objective physiological data. Given the prevalence of new technological monitoring devices, it may be feasible for any airline to purchase a number of such monitoring devices and collect actual behavioral symptoms of fatigue, of course with the approval of the subjects and within the limits of personal data protection. These monitoring devices, along with in-flight cameras and blood tests, give a very good picture of crew internal state and have been used successfully in the last years (Gander, Hartley, et al, 2011). Sleep patterns, quality of sleep and onset of sleep could thus be correlated with the recovery factors. Up until now, these devices have been the privilege of the larger airlines as they have entailed a large sum of cost for their use. However, as the monitoring devices advance technologically and become less costly, it may be possible for smaller airlines to easily collect data on other bodily markers, e.g. blood pressure and pulse, to give a more accurate picture of life on base, as well as in the air.

Lastly, the positive aspects of social relationships on base might be worthy addition to the next study. Sonnentag & Fritz (2007) mentioned the possibility but warned that social activity might be a double edged sword, capable of causing both good and bad experiences. However, given the situation we are studying, i.e. crews away from home for a long period of time, perhaps social work interaction serves a greater positive role that undermines the Work Detachment factor. Future studies might want to investigate levels of social interactions on base, the perceived positivity of such interactions and correlate with well-being factors.

The goal of increasing crew well-being while on long term stay is quite relevant to aviation safety. This has risen in prominence during these last months as job-stress and mental health has become the key topic in the world of airline management. Reducing stress, increasing well-being and recovery is thus a worthy pursuit for any airline manager.

ACKNOWLEDGEMENTS

I wish to thank SmartLynx Airlines for the opportunity to conduct this survey and being a supportive partner in this increasingly relevant field of aviation crew fatigue and Fatigue Risk Management.

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APPENDIX 1. PARTICIPANT COMMENTS

Do not push crews to fly when they are tired.

Very often people working at the office doesn't respect pilot.

The lack of stable contract with a fix salary increase the level of fatigue in a crew member

I have been working for other airline and also talked with my colleagues who work in Europe , Middle East and USA and I can honestly say Smart-lynx is showing great flexibility towards crew needs and duty planning . I definitely feel heard and supported by Smart Lynx .

The remote location of the hotel, lack of shop and alternative food sources, and no fridge in a room causing bad quality of a rest during off days and between duties.

As you well know the schedule with Corendon is extremely unstable and quite literally changes at least twice a day, so it is impossible to plan trips to see things further from the hotel even on your days off out of fear that you will suddenly be required to fly. It feels like an 'off' day in outstations is not quite an 'off day' but more of a standby. When it happens to be a good hotel like the crown plaza here in SAW it is somewhat acceptable as there is a GYM, a pool and things to do in the shopping mall, however sometimes you don't get this luxury and it makes one very homesick and not enjoy work at all.

Too slow internet connection on NH airport hotel

Nothing to go somewhere and relax in the vicinity of hotel.

It would be great to have:

1 more sport activities around hotel,

2 free company car(s)

3 improve breakfast

-n/a- :)

Main point which ruins all the personal schedule is last minute changes done by crew ops and crew support arranging your duty travel tickets. Last week example TVL for 6 month duty trip out of home base rescheduled less than 24 hours before, w/o any notice. As a result all the day's plans were ruined as I had to leave early in the morning instead of evening.

If some duty trip is planned for several weeks before why tickets cannot be arranged in advance to avoid such hustle.

Because I just woke up after work!

It will be more comfortable for me in case of I can receive SMS with details of change roster, especially in DAYS OFF (for example-22April your flight canceled) instead of 'Please see and confirm yours roster changes'

Quality of rest depends on many factors. One of the main factors - organizing off duty time, social and personal life.

Problems we face organizing personal life:

1) Lack of information about the roster

Last year planning department promised to publish roster for 1 months. In general we are getting just excuses, but not the roster. It's difficult to plan anything if you don't know your schedule after 14 days. That's really disturbing factor.

2) Lack of information about hotels and accommodation.

Crew support department sometimes have no idea about hotels on bases in advance, however some of colleagues have information in advance from other sources - management, friends, client company etc.

3) Luck of information about the bases.

In the beginning of the year crew were informed about possible bases. Later on bases changed. Just for example - no AYT, BJV, but new bases as OSR and ORY. No official info from planning, just some rumors.

4) Also important factor - hotel.

Usually crew is staying at hotel nearby airport. And as a rule these hotels are for 1-2 night stay, not for leaving there 4-6 month. These hotel are convenient for getting to/from airport, but not for normal life.

I would like to have back my six days OFF in a row.

Thank you

When coming from duty trip, for example one month duty on outstation, there should be some limited time on home base spent, for example 2 weeks , when it is possible take time for yourself and have rest.

The work schedule changes so often and sometimes so rapidly that it is hard to plan anything and often planned home leave is postponed that also my family find it hard to count on me.

No changing of hotels as often with all the belongings, so that we dont feel like nomads.

Finding good apartments when staying longer than a month as soon as possible.

APPENDIX 2. RESPONSES TO THE IDENTIFIED BEHAVIOR QUESTIONS

APPENDIX 2 Table 1.
I try to schedule having breakfast with my colleagues.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	4	3.9	3.9	3.9
	I somewhat disagree	10	9.8	9.8	13.7
	Neutral	26	25.5	25.5	39.2
	I somewhat agree	33	32.4	32.4	71.6
	I fully agree	29	28.4	28.4	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 2.
I try to find an enjoyable place away from the hotel and keep it to myself.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	13	12.7	12.7	12.7
	I somewhat disagree	21	20.6	20.6	33.3
	Neutral	29	28.4	28.4	61.8
	I somewhat agree	32	31.4	31.4	93.1
	I fully agree	7	6.9	6.9	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 3.

I set up a training regime in the hotel gym.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	14	13.7	13.7	13.7
	I somewhat disagree	7	6.9	6.9	20.6
	Neutral	18	17.6	17.6	38.2
	I somewhat agree	33	32.4	32.4	70.6
	I fully agree	30	29.4	29.4	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 4.

I attend crew parties near every night when off duty.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	33	32.4	32.4	32.4
	I somewhat disagree	28	27.5	27.5	59.8
	Neutral	24	23.5	23.5	83.3
	I somewhat agree	14	13.7	13.7	97.1
	I fully agree	3	2.9	2.9	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 5.

I tend to stay in my room most days and avoid contact with colleagues.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	51	50.0	50.0	50.0
	I somewhat disagree	26	25.5	25.5	75.5
	Neutral	13	12.7	12.7	88.2

I somewhat agree	11	10.8	10.8	99.0
I fully agree	1	1.0	1.0	100.0
Total	102	100.0	100.0	

APPENDIX 2 Table 6.

I actively explore the region around the hotel.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	1	1.0	1.0	1.0
	I somewhat disagree	6	5.9	5.9	6.9
	Neutral	12	11.8	11.9	18.8
	I somewhat agree	41	40.2	40.6	59.4
	I fully agree	41	40.2	40.6	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
Total		102	100.0		

APPENDIX 2 Table 7.

I use the off time to further my education or training.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I somewhat disagree	6	5.9	5.9	5.9
	Neutral	20	19.6	19.6	25.5
	I somewhat agree	52	51.0	51.0	76.5
	I fully agree	24	23.5	23.5	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 8.

I tend to join my colleagues for activities away from the hotel.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	3	2.9	2.9	2.9
	I somewhat disagree	4	3.9	3.9	6.9
	Neutral	21	20.6	20.6	27.5
	I somewhat agree	55	53.9	53.9	81.4
	I fully agree	19	18.6	18.6	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 9.

I sometimes rent a car to travel more extensively while on off days.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	12	11.8	11.8	11.8
	I somewhat disagree	13	12.7	12.7	24.5
	Neutral	30	29.4	29.4	53.9
	I somewhat agree	36	35.3	35.3	89.2
	I fully agree	11	10.8	10.8	100.0

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	12	11.8	11.8	11.8
	I somewhat disagree	13	12.7	12.7	24.5
	Neutral	30	29.4	29.4	53.9
	I somewhat agree	36	35.3	35.3	89.2
	I fully agree	11	10.8	10.8	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 10.

I attend dinners with my colleagues most nights.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	5	4.9	5.0	5.0
	I somewhat disagree	19	18.6	18.8	23.8
	Neutral	31	30.4	30.7	54.5
	I somewhat agree	38	37.3	37.6	92.1
	I fully agree	8	7.8	7.9	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
	Total	102	100.0		

APPENDIX 2 Table 11.

I go to the swimming pool near every day (if available).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	8	7.8	7.8	7.8
	I somewhat disagree	11	10.8	10.8	18.6
	Neutral	26	25.5	25.5	44.1
	I somewhat agree	36	35.3	35.3	79.4
	I fully agree	21	20.6	20.6	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 12.

I go to the nearby beach (if available) on a regular basis.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	4	3.9	3.9	3.9
	I somewhat disagree	5	4.9	4.9	8.8
	Neutral	20	19.6	19.6	28.4
	I somewhat agree	35	34.3	34.3	62.7
	I fully agree	38	37.3	37.3	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 13.

I go out on the nightlife most off duty nights.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	37	36.3	36.3	36.3
	I somewhat disagree	39	38.2	38.2	74.5
	Neutral	19	18.6	18.6	93.1
	I somewhat agree	4	3.9	3.9	97.1
	I fully agree	3	2.9	2.9	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 14.

I go sightseeing alone.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	11	10.8	10.8	10.8
	I somewhat disagree	18	17.6	17.6	28.4
	Neutral	28	27.5	27.5	55.9
	I somewhat agree	37	36.3	36.3	92.2
	I fully agree	8	7.8	7.8	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 15.

I catch up on my reading.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I somewhat disagree	10	9.8	9.8	9.8
	Neutral	26	25.5	25.5	35.3
	I somewhat agree	49	48.0	48.0	83.3
	I fully agree	17	16.7	16.7	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 16.

I tend to drink more than usual during my off hours on base.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	59	57.8	57.8	57.8
	I somewhat disagree	10	9.8	9.8	67.6
	Neutral	26	25.5	25.5	93.1
	I somewhat agree	6	5.9	5.9	99.0
	I fully agree	1	1.0	1.0	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 17.

I contact my family at home via telephone or video chat on a regular basis.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	3	2.9	2.9	2.9
	I somewhat disagree	6	5.9	5.9	8.8
	Neutral	4	3.9	3.9	12.7
	I somewhat agree	24	23.5	23.5	36.3
	I fully agree	65	63.7	63.7	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 18.

I use medication to control my sleep.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	88	86.3	86.3	86.3
	I somewhat disagree	9	8.8	8.8	95.1
	Neutral	4	3.9	3.9	99.0
	I fully agree	1	1.0	1.0	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 19.

I try to swap duties with other crew members in order to organize my off day activities.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	52	51.0	51.0	51.0
	I somewhat disagree	19	18.6	18.6	69.6
	Neutral	17	16.7	16.7	86.3
	I somewhat agree	12	11.8	11.8	98.0
	I fully agree	2	2.0	2.0	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 20.

I do some shopping in order to pass the time.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	13	12.7	12.7	12.7
	I somewhat disagree	12	11.8	11.8	24.5
	Neutral	26	25.5	25.5	50.0
	I somewhat agree	35	34.3	34.3	84.3
	I fully agree	16	15.7	15.7	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 21.

I try actively to meet new people away from work.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	12	11.8	11.8	11.8
	I somewhat disagree	20	19.6	19.6	31.4
	Neutral	42	41.2	41.2	72.5
	I somewhat agree	19	18.6	18.6	91.2
	I fully agree	9	8.8	8.8	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 22.

I play computer games in my hotel room.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	66	64.7	64.7	64.7
	I somewhat disagree	12	11.8	11.8	76.5
	Neutral	12	11.8	11.8	88.2
	I somewhat agree	8	7.8	7.8	96.1
	I fully agree	4	3.9	3.9	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 23.

I watch TV-shows or movies in my hotel room.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	14	13.7	13.7	13.7
	I somewhat disagree	15	14.7	14.7	28.4
	Neutral	19	18.6	18.6	47.1
	I somewhat agree	35	34.3	34.3	81.4
	I fully agree	19	18.6	18.6	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 24.

I cannot schedule my off time due to schedule instability.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	18	17.6	17.6	17.6
	I somewhat disagree	16	15.7	15.7	33.3
	Neutral	20	19.6	19.6	52.9
	I somewhat agree	36	35.3	35.3	88.2
	I fully agree	12	11.8	11.8	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 25.

I tend to experience homesickness.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	25	24.5	24.8	24.8
	I somewhat disagree	21	20.6	20.8	45.5
	Neutral	32	31.4	31.7	77.2
	I somewhat agree	19	18.6	18.8	96.0
	I fully agree	4	3.9	4.0	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
Total		102	100.0		

APPENDIX 2 Table 26.

I try to arrange for my family to join me on base for some period of time.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	19	18.6	18.6	18.6
	I somewhat disagree	7	6.9	6.9	25.5
	Neutral	23	22.5	22.5	48.0
	I somewhat agree	30	29.4	29.4	77.5
	I fully agree	23	22.5	22.5	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 27.

I try to immerse myself in a hobby during my off duty hours.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	5	4.9	4.9	4.9
	I somewhat disagree	8	7.8	7.8	12.7
	Neutral	33	32.4	32.4	45.1
	I somewhat agree	43	42.2	42.2	87.3
	I fully agree	13	12.7	12.7	100.0
	Total	102	100.0	100.0	

APPENDIX 2 Table 28.

I try to personalize my hotel room for the duration of my stay (e.g. photographs, art, moving furniture).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I fully disagree	25	24.5	24.5	24.5
	I somewhat disagree	19	18.6	18.6	43.1
	Neutral	26	25.5	25.5	68.6
	I somewhat agree	19	18.6	18.6	87.3
	I fully agree	13	12.7	12.7	100.0
	Total	102	100.0	100.0	

Pedagoģijas, psiholoģijas un mākslas fakultātes
Psiholoģijas nodaļas
vadītājam profesoram Ivaram Austeram

Psiholoģijas maģistra studiju programmas
2. semestra studentes
Sigurdur Gislason, stud. apl. Nr. Sg14047

iesniegums.

Lūdzu apstiprināt maģistra darba tematu „AVIATION CREW RECOVERY EXPERIENCES ON OUTSTATIONS”.

Darba vadītāja: profesore Dr. psych. Ivars Austers.

Rīgā, 01.06.2015. (personiskais paraksts) S.Gislason

Saskaņots: (personiskais paraksts) I. Austers 01.06.2015.

Apstiprinu: nodaļas vadītājs (personiskais paraksts) I. Austers 01.06.2015.